

2016 Technology•Media•Telecom Purchase Price Allocation Study

OCTOBER 2017

Introduction

Houlihan Lokey Financial Advisory Service's Technology•Media•Telecom (TMT) Group completed its 2016 Purchase Price Allocation Study (2016 Study) by reviewing public filings for 446 completed transactions in 2016 and summarizing the results for certain transactions. The 2016 Study provides statistics, other annual data, and a comparison to certain 2015 results (2015 Study), 2014 results (2014 Study), and 2013 results (2013 Study).

- Of the 446 transactions in our initial screening, 309 transactions were not considered due to one of two reasons: 1) financial statements did not present intangible asset values and/or purchase consideration (PC) information in a clear, reconcilable format, or 2) the general asset and liability segmentation was insufficient for us to determine the nature of the intangible assets acquired.
- The 137 TMT transactions that form the basis of the 2016 Study represent 31% of the total original population.
- The 2016 Study also presents asset allocation information by nine TMT subsectors, including telecommunications and network service carriers; application software; broadcasting, entertainment, and gaming; communications equipment; data processing and outsourced services; electronics; home entertainment software; internet software and others; and semiconductors.

For more information regarding our 2016 Study, please contact your Houlihan Lokey representative or one of the following individuals:



Michael De Simone
Managing Director
404.495.7033
MDeSimone@HL.com
Atlanta



John McIntosh
Director
415.273.3644
JMcIntosh@HL.com
San Francisco



Brian Marler
Director
310.712.6548
BMarler@HL.com
Los Angeles



Kelly Fang
Senior Vice President
415.273.3631
KFang@HL.com
San Francisco

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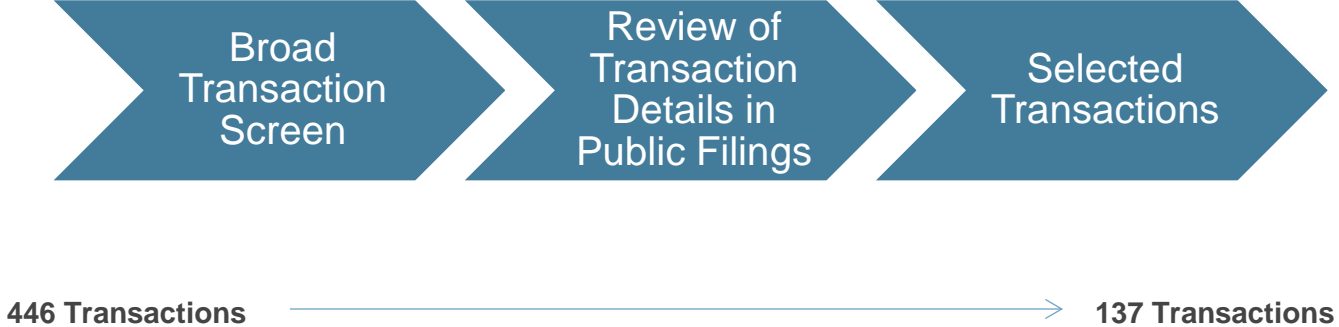
Screening Criteria and Methodology

The universe of transactions initially considered in the 2016 Study was obtained from S&P Capital IQ using the following search criteria:

- Transaction closed in 2016
- 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 446 transactions. We reviewed public filings for each company in the initial sample with the objective of finding detailed disclosures regarding PC, identifiable intangible asset fair values, and goodwill. Sufficient disclosures were provided for 137 transactions, which represented approximately 31% of the initial sample.

These 137 transactions formed the basis of the 2016 Study.



TMT Subsector Results

Summary Allocation Percentages

2016 Study

\$ in millions

	Count	Purchase Consideration		Intangible Assets, % of PC [1]				Goodwill, % of PC			
		Median	Mean	Low	High	Median	Mean	Low	High	Median	Mean
TMT	137	\$61	\$1,236	2%	81%	37%	37%	5%	86%	47%	45%
Telecommunications and Network Service Carriers	3	18	237	20%	77%	61%	53%	19%	39%	28%	29%
Application Software	20	40	494	15%	63%	41%	40%	10%	73%	47%	46%
Broadcasting, Entertainment, and Gaming	8	35	253	2%	77%	47%	49%	6%	60%	26%	29%
Communications Equipment	7	53	275	28%	52%	29%	35%	14%	63%	32%	34%
Data Processing and Outsourced Services	8	43	1,056	20%	66%	34%	39%	5%	65%	45%	38%
Electronics	15	74	729	11%	67%	41%	40%	11%	84%	36%	38%
Home Entertainment Software	2	43	43	41%	60%	51%	51%	38%	56%	47%	47%
Internet Software and Others [2]	67	76	1,121	8%	81%	32%	34%	7%	86%	53%	52%
Semiconductors	6	2,893	9,956	18%	64%	36%	38%	22%	53%	39%	38%

[1] PC refers to purchase consideration.

[2] Others include integrated telecommunications services, internet software and services, IT consulting, systems software, technology hardware, and wireless communications services.

Transaction Size

- Approximately 68% of the TMT transactions in the 2016 Study had PC below \$250 million, and approximately 46% of the transactions had PC below \$50 million.
- From 2015 to 2016, the average transaction size increased from \$582 million to \$1,236 million due to a jump in mega deals. In 2015, there were only three TMT transactions over \$5 billion, but in 2016 there were six TMT transactions over \$5 billion.
- The median transaction size increased from \$37 million in 2015 to \$61 million in 2016, again due to an increase in larger deals.
- From 2015 to 2016, the median goodwill as a percentage of total PC decreased from 65% to 47%. The year-over-year downward trend is consistent across the TMT subsectors.

Summary Allocation Percentages by Size

2016 Study

\$ in millions

	Count	Median Results									
		PC		Intangible Assets, % of PC				Goodwill, % of PC			
		Median	Mean	Low	High	Median	Mean	Low	High	Median	Mean
All Transactions	137	\$61	\$1,236	2%	81%	37%	37%	5%	86%	47%	45%
PC > \$5,000	6	8,765	18,107	19%	31%	27%	27%	22%	69%	55%	51%
\$1,000 < PC < \$5,000	18	2,676	2,521	2%	49%	30%	30%	11%	81%	43%	45%
\$500 < PC < \$1,000	8	740	743	11%	48%	28%	29%	16%	85%	48%	51%
\$250 < PC < \$500	12	366	366	8%	77%	34%	35%	14%	71%	51%	46%
\$100 < PC < \$250	15	179	182	14%	45%	38%	35%	7%	86%	50%	51%
\$50 < PC < \$100	15	70	69	14%	64%	33%	37%	14%	71%	45%	44%
\$25 < PC < \$50	21	37	37	15%	66%	45%	45%	10%	73%	35%	38%
\$10 < PC < \$25	19	16	17	19%	67%	36%	42%	5%	76%	41%	42%
\$5 < PC < \$10	12	7	8	23%	81%	40%	43%	6%	72%	47%	42%
PC < \$5	11	3	3	9%	77%	39%	40%	19%	86%	49%	50%

[1] PC refers to purchase consideration.

Frequently Identified Intangible Assets

- Developed technology, in-process research and development (IPR&D), customer-related assets, and trademarks and trade names were the most commonly identified intangible assets. Other intangible assets typically included non-compete agreements, licenses, permits, and other contracts or agreements.
- From 2015 to 2016, the median developed technology as a percentage of total PC decreased from 17% to 13% while customer-related assets increased from 15% to 18%. IPR&D and trade names remained flat year-over-year, representing 4% and 2% of total PC, respectively.

Frequently Identified Intangible Assets

2016 Study

	Count, % of Sample				Median % of PC			
	2016	2015	2014	2013	2016	2015	2014	2013
Developed Technology	75%	86%	79%	84%	13%	17%	12%	16%
<i>Change</i>	-11%	7%	-5%	--	-4%	5%	-4%	--
IPR&D	18%	11%	12%	16%	4%	4%	4%	7%
<i>Change</i>	7%	-1%	-4%	--	0%	0%	-3%	--
Customer-Related Assets	84%	84%	72%	73%	18%	15%	13%	9%
<i>Change</i>	0%	12%	-1%	--	3%	2%	4%	--
Trademarks and Trade Names	51%	59%	58%	54%	2%	2%	2%	1%
<i>Change</i>	-8%	1%	4%	--	0%	0%	1%	--

Developed Technology

- Developed technology remains a key intangible asset or strategic rationale for most TMT transactions, especially in the semiconductor and communications equipment sectors.
- In the 2016 Study, 103 transactions (75%) allocated PC to developed technology.
- The mean allocation of PC to developed technology was 16%, while the median was 13%.

Summary of PC Allocated to Developed Technology

2016 Study

\$ in millions

	Count			PC [1]		Developed Technology, % of PC				Goodwill, % of PC			
	Developed	All	%	Median	Mean	Low	High	Median	Mean	Low	High	Median	Mean
TMT	103	137	75%	\$61	\$1,236	0%	80%	13%	16%	5%	86%	47%	45%
Telecommunications and Network Service Carriers	1	3	33%	18	237	3%	3%	3%	3%	19%	39%	28%	29%
Application Software	15	20	75%	40	494	3%	46%	12%	17%	10%	73%	47%	46%
Broadcasting, Entertainment, and Gaming	1	8	13%	35	253	19%	19%	19%	19%	6%	60%	26%	29%
Communications Equipment	7	7	100%	53	275	4%	22%	16%	14%	14%	63%	32%	34%
Data Processing and Outsourced Services	8	8	100%	43	1,056	3%	45%	7%	16%	5%	65%	45%	38%
Electronics	11	15	73%	74	729	0%	39%	10%	13%	11%	84%	36%	38%
Home Entertainment Software	1	2	50%	43	43	1%	1%	1%	1%	38%	56%	47%	47%
Internet Software and Others [2]	52	67	78%	76	1,121	0%	80%	13%	17%	7%	86%	53%	52%
Semiconductors	7	7	100%	2,758	8,596	9%	27%	20%	20%	22%	53%	36%	38%

[1] PC refers to purchase consideration.

[2] Others include integrated telecommunications services, internet software and services, IT consulting, systems software, technology hardware, and wireless communications services.

In-Process Research & Development

- In the 2016 Study, 25 transactions (18%) allocated PC to IPR&D.
- The mean allocation of PC to IPR&D was 13%, while the median was 4%.

Summary of PC Allocated to IPR&D

2016 Study

\$ in millions

	Count			PC [1]		IPR&D, % of PC				Goodwill, % of PC			
	IPR&D	All	%	Median	Mean	Low	High	Median	Mean	Low	High	Median	Mean
TMT	25	137	18%	\$61	\$1,236	0%	67%	4%	13%	5%	86%	47%	45%
Telecommunications and Network Service Carriers	0	3	0%	18	237	0%	0%	--	--	19%	39%	28%	29%
Application Software	4	20	20%	40	494	2%	42%	13%	17%	10%	73%	47%	46%
Broadcasting, Entertainment, and Gaming	0	8	0%	35	253	0%	0%	--	--	6%	60%	26%	29%
Communications Equipment	2	7	29%	53	275	2%	3%	2%	2%	14%	63%	32%	34%
Data Processing and Outsourced Services	0	8	0%	43	1,056	0%	0%	--	--	5%	65%	45%	38%
Electronics	7	15	47%	74	281	0%	67%	2%	16%	11%	84%	36%	38%
Home Entertainment Software	0	2	0%	43	43	0%	0%	--	--	38%	56%	47%	47%
Internet Software and Others [2]	5	67	7%	76	1,121	0%	54%	2%	17%	7%	86%	53%	52%
Semiconductors	7	7	100%	2,758	8,596	3%	27%	4%	9%	22%	53%	36%	38%

[1] PC refers to purchase consideration.

[2] Others include integrated telecommunications services, internet software and services, IT consulting, systems software, technology hardware, and wireless communications services.

Customer-Related Intangible Assets

- Customer relationships and contracts remain a key intangible asset or strategic rationale for most TMT transactions, especially in the telecommunications and media sectors.
- In the 2016 Study, 115 transactions (84%) allocated PC to customer-related intangibles.
- The mean allocation percentage of PC to customer-related intangibles was 20%, while the median was 18%.

Summary of PC Allocated to Customer-Related Intangible Assets

2016 Study

\$ in millions

	Count		PC [1]		Customer-Related Assets, % of PC				Goodwill, % of PC				
	Customer-Related Assets	All	%	Median	Mean	Low	High	Median	Mean	Low	High	Median	Mean
TMT	115	137	84%	\$61	\$1,236	0%	77%	18%	20%	5%	86%	47%	45%
Telecommunications and Network Service Carriers	3	3	100%	18	237	3%	77%	60%	47%	19%	39%	28%	29%
Application Software	16	20	80%	40	494	7%	52%	18%	22%	10%	73%	47%	46%
Broadcasting, Entertainment, and Gaming	3	8	38%	35	253	21%	71%	35%	42%	6%	60%	26%	29%
Communications Equipment	7	7	100%	53	275	5%	37%	20%	18%	14%	63%	32%	34%
Data Processing and Outsourced Services	8	8	100%	43	1,056	13%	31%	22%	22%	5%	65%	45%	38%
Electronics	12	15	80%	74	729	3%	46%	22%	23%	11%	84%	36%	38%
Home Entertainment Software	1	2	50%	43	43	39%	39%	39%	39%	38%	56%	47%	47%
Internet Software and Others [2]	58	67	87%	76	1,121	0%	58%	17%	17%	7%	86%	53%	52%
Semiconductors	7	7	100%	2,758	8,596	1%	17%	7%	8%	22%	53%	36%	38%

[1] PC refers to purchase consideration.

[2] Others include integrated telecommunications services, internet software and services, IT consulting, systems software, technology hardware, and wireless communications services.

Trademarks and Trade Names

- In the 2016 Study, 70 transactions (51%) allocated PC to trademarks and trade names.
- The mean allocation percentage of PC to trademarks and trade names was 4%, while the median was 2%.

Summary of PC Allocated to Trademarks and Trade Names

2016 Study

\$ in millions

	Count			PC [1]		Trademarks and Trade Names, % of PC				Goodwill, % of PC			
	Trademarks and Trade Names	All	%	Median	Mean	Low	High	Median	Mean	Low	High	Median	Mean
TMT	70	137	51%	\$61	\$1,236	0%	39%	2%	4%	5%	86%	47%	45%
Telecommunications and Network Service Carriers	2	3	67%	18	237	0%	1%	1%	1%	19%	39%	28%	29%
Application Software	6	20	30%	40	494	1%	8%	4%	4%	10%	73%	47%	46%
Broadcasting, Entertainment, and Gaming	4	8	50%	35	253	1%	39%	2%	11%	6%	60%	26%	29%
Communications Equipment	5	7	71%	53	275	0%	10%	3%	4%	14%	63%	32%	34%
Data Processing and Outsourced Services	5	8	63%	43	1,056	0%	5%	1%	2%	5%	65%	45%	38%
Electronics	11	15	73%	74	729	0%	21%	3%	5%	11%	84%	36%	38%
Home Entertainment Software	1	2	50%	43	43	1%	1%	1%	1%	38%	56%	47%	47%
Internet Software and Others [2]	32	67	48%	76	1,121	0%	18%	2%	4%	7%	86%	53%	52%
Semiconductors	4	7	57%	2,758	8,596	0%	2%	1%	1%	22%	53%	36%	38%

[1] PC refers to purchase consideration.

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

Corporate Finance

2016 M&A Advisory Rankings All U.S. Transactions

	Advisor	Deals
1	Houlihan Lokey	179
2	JP Morgan	150
3	Goldman Sachs & Co	142
4	Morgan Stanley	132
5	Barclays	105

Source: Thomson Reuters

No. 1 U.S. M&A Advisor

Top 10 Global M&A Advisor

Leading Capital Markets Advisor

Financial Restructuring

2016 Global Distressed Debt & Bankruptcy Restructuring Rankings

	Advisor	Deals
1	Houlihan Lokey	71
2	Rothschild & Co.	47
3	Moelis & Co.	38
4	Lazard	36
5	PJT Partners LP	31

Source: Thomson Reuters

No. 1 Global Restructuring Advisor

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

Financial Advisory

1997 to 2016 Global M&A Fairness Advisory Rankings

	Advisor	Deals
1	Houlihan Lokey	996
2	JP Morgan	953
3	Bank of America Merrill Lynch	728
4	Morgan Stanley	665
5	Duff & Phelps	601

Source: Thomson Reuters. Announced or completed transactions.

No. 1 Global M&A Fairness Opinion
Advisor

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

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Business Services

Consumer, Food & Retail

Energy

Financial Institutions

Healthcare

Industrials

Real Estate, Lodging & Leisure

Technology•Media•Telecom

Transportation & Logistics

Financial Sponsors

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Hedge Funds

Capital Alliances

Our clients benefit from our local presence and global reach.

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Dallas
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Minneapolis
New York
San Francisco
Washington, D.C.

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Frankfurt
London
Madrid
Milan
Paris
Rome

Asia-Pacific

Beijing
Hong Kong
Mumbai
Singapore
Sydney
Tokyo

#1 Position Across Product Categories



HOULIHAN LOKEY

Corporate Finance

Mergers & Acquisitions

- Sellside & Buy-side 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 and 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 and 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 and Acquisitions

Strategic Consulting

Strategy & Execution

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

Sales & Marketing Management

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

Operations & Performance Improvement

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

No. 1 M&A Advisor on U.S. Transactions in 2016

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

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Financial Reporting Update: Measurement of Minority Equity Investments

The Financial Accounting Standards Board (FASB) recently issued ASU 2016-01,⁽¹⁾ amending previous guidance in U.S. Generally Accepted Accounting Principles (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 other comprehensive income (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 nonpublic 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*.

Financial Reporting Update: Measurement of Goodwill Impairment

The FASB recently issued ASU 2017-04,⁽¹⁾ which simplifies the goodwill impairment testing process by eliminating the Step 2 portion of the existing guidance.

Background

- Under the existing guidance, a Step 2 test is performed if a reporting unit fails a Step 1 test.
 - The Step 2 test is similar to the requirements of a purchase price allocation for a business combination, because the fair value of all assets and liabilities of the reporting unit needs to be determined as of the testing date.
- Under the new guidance, companies will measure impairment by determining the amount by which a reporting unit's carrying value exceeds its fair value. (Note, however, that impairment cannot exceed the carrying amount of goodwill allocated to that reporting unit.)
- Nearly all other goodwill impairment guidance remains unchanged. For example, companies can still elect to perform a qualitative assessment (Step 0) to determine whether a Step 1 test is necessary.

Observations

- The new guidance not only simplifies financial reporting but also diminishes the differences between U.S. GAAP and International Financial Reporting Standards (IFRS), as IFRS also has a single-step process for calculating goodwill impairment.
- Under the former standard, failing Step 1 might not result in any goodwill impairment. Under the new guidance, however, failing Step 1 will always result in a goodwill impairment. Therefore, it is likely there will be more impairment charges, all other things being equal, under the new standard than under the old.
- With respect to the amount of the impairment charge under the new standard as compared to the old, this will depend on specific factors (for example, whether reporting units have unrecognized or appreciated assets and whether the fair value of the reporting unit's long-lived assets is below their book value).

Important Dates

- This accounting update is effective for annual or interim goodwill impairment tests for U.S. Securities and Exchange Commission (SEC) filers beginning after December 15, 2019. For public entities that are not SEC filers, the guidance is effective beginning after December 15, 2020. For all other entities, the guidance is effective beginning after December 15, 2021. Early adoption is permitted for annual or interim goodwill impairment tests performed on testing dates after January 1, 2017.

(1) FASB Accounting Standards Update 2017-04, *Simplifying the Test for Goodwill Impairment*.

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