DUFF & PHELPS

Protect, Restore and Maximize Value

Valuation Insights

First Quarter 2019

INSIDE

EXECUTIVE SUMMARY

In this edition of *Valuation Insights*, we present highlights from the Duff & Phelps 2018 U.S. Goodwill Impairment Study, now in its tenth year, which examines general and industry goodwill impairment trends of more than 8,400 U.S. publicly-traded companies through December 2017.

In our Technical Notes section, we analyze Duff & Phelps' recent U.S. Equity Risk Premium Recommendation ("ERP"), which increased from 5.0% to 5.5% effective December 31, 2018, and the factors considered in periodic reassessments of the selected ERP and accompanying risk-free rate.

In our International in Focus article, we discuss the Duff & Phelps Transaction Trail 2018 Report, which takes an in-depth look at transaction and capital markets activities, including mergers and acquisitions, private equity and venture capital investments as well as initial public offerings, in Singapore, Malaysia and Indonesia over the course of 2018.

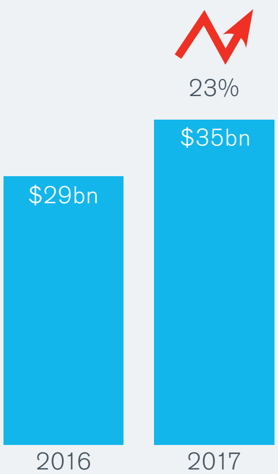
Finally, our Spotlight article reviews new features recently added to the Duff & Phelps Cost of Capital Navigator, the web-based tool that assists valuation professionals in calculating cost of capital. The new features provide significant benefits to Navigator users in the form of additional data, information and enhanced functionality.

In every issue of *Valuation Insights*, you will find industry market multiples that are useful for benchmark valuation purposes. We hope that you will find this and future issues of this newsletter informative and reliable.

Industry Market Multiples Online
Valuation Insights Industry Market Multiples are online with data back to 2010.
Analyze market multiple trends over time across industries and geographies.
www.duffandphelps.com/multiples

Duff & Phelps
2018 U.S. Goodwill Impairment Study

2018 U.S. Goodwill Impairment Study (the "Study") marks the 10th consecutive year that Duff & Phelps has issued a comprehensive goodwill impairment study. The 2018 Study examined general and industry goodwill impairment trends of more than 8,400 U.S. publicly-traded companies through December 2017.



Total GWI
(U.S. Public Companies)

Robust M&A activity in 2017, fueled by favorable economic and financial market conditions, added nearly $319 billion of goodwill to U.S. companies' balance sheets, the highest level of aggregate goodwill added since Duff & Phelps began compiling this data in 2008. However, despite the strength in both the global economy and U.S. equity markets, U.S. companies experienced a 23% increase in the aggregate goodwill impairment ("GWI") amount, from $28.5 billion in 2016 to $35.1 billion in 2017. On the other hand, the number of GWI events increased only marginally, from 288 in 2016 to 293 in 2017. This implies that the magnitude of impairments generally increased with the average GWI per event rising by 21% in 2017, to $120 million.

Current 2018 disclosures indicate that the top three GWI events alone will approach $30 billion, which combined with several other material impairments already reported, suggests that the 2018 aggregate GWI will likely surpass the 2017 amount.

Industry Highlights

Seven out of the ten industries analyzed saw their aggregate GWI amounts increase in 2017. The Consumer Discretionary sector has suffered from an increasing share of GWI for three consecutive years and was the hardest-hit industry during 2017, as overall GWI increased by 71% from $5.4 to $9.3 billion. This industry may face further strain in the months ahead, given that economists and market analysts are predicting a slowdown in economic growth. Healthcare and Telecommunication Services also suffered from dramatic increases in GWI from 2016 to 2017, with Healthcare GWI surging from $3.1 to $7.2 billion and Telecommunication Services from $3 million to $4.9 billion.

In contrast, the Energy sector, the worst-impacted industry for three consecutive years (2014-2016), saw the biggest improvement in goodwill impairments during 2017, signaling a resilient recovery in this vitally important part of the U.S. economy. The improvement may be short-lived, however, as oil prices have retreated from their 2017 levels, with West Texas Intermediate (WTI) crude oil dropping 24% in 2018. Information Technology also had a material decline in GWI, dropping from $4.1 billion in 2016 to $1.3 billion in 2017.

Accounting Model for Goodwill

Over the past 10 years, the accounting model for goodwill under U.S. GAAP underwent several significant changes and simplifications. A qualitative test (aka., Step 0) was introduced in 2011, while in 2014 a private company alternative was created, allowing private entities to elect the amortization of goodwill on a straight-line basis over a specified number of years. Most recently, the model was further simplified through the issuance in January 2017 of Accounting Standards Update (ASU) No. 2017-04, *Intangibles—Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment*.

ASU 2017-04, which eliminated Step 2 of the goodwill impairment test, has an effective date for calendar year-end U.S. publicly-traded companies beginning in January 2020. However, ASU 2017-04 allows for early adoption and the 2018 Study revealed that, of the companies recording the top 10 largest goodwill impairment events in 2017, 80% have already adopted the new simplified test. Whether this rapid pace of early adoption will extend to the general universe of companies remains to be seen.

The FASB's main objective in introducing these simplifications was to reduce preparers' cost and complexity in the subsequent measurement of goodwill. Such savings may lead more companies to early adopt the modified impairment test. The FASB concluded that the pared-down model would still maintain the usefulness of the information provided to users of financial statements. In addition, some FASB stakeholders (e.g., FASB's Investment Advisory Committee) do not believe a further simplified goodwill accounting model, such as the private company alternative, would be suitable for public companies. In contrast to non-cash amortization charges, which have no information value, an impairment model founded on fair value can provide insight about management's stewardship in making investment decisions and successfully integrating acquisitions.

2018 European Goodwill Impairment Study

Forthcoming in the first quarter 2019, the sixth edition of the Duff & Phelps European Goodwill Impairment Study will examine general GWI trends across industries and countries in the European market, by analyzing firms within the STOXX® Europe 600 Index. European companies in the Index recognized a total of €18.5 billion of GWI in calendar year 2017, a decrease of approximately 35% from €28.4 billion in 2016, reflecting a strong year of economic expansion.

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Duff & Phelps U.S. Equity Risk Premium Recommendation Increased from 5.0% to 5.5%, Effective December 31, 2018

The Equity Risk Premium ("ERP") is a key input used to calculate the cost of capital within the context of the Capital Asset Pricing Model ("CAPM") and other models. There is ample academic evidence that the ERP is not constant over time. Fluctuations in global economic and financial conditions warrant periodic reassessments of the selected ERP and accompanying risk-free rate.

Based upon current market conditions, **Duff & Phelps is increasing its U.S. Equity Risk Premium recommendation from 5.0% to 5.5%.** The 5.5% ERP guidance is to be used in conjunction with a normalized risk-free rate of 3.5% when developing discount rates as of **December 31, 2018 and thereafter**, until further guidance is issued.

Duff & Phelps last changed its U.S. ERP recommendation on September 5, 2017. On that date, our recommendation was decreased to 5.0% (from 5.5%) in response to evidence in late 2016 and early to mid-2017 that suggested a subdued level of risk in financial markets. Back then, strong earnings growth, still-accommodative monetary policies, and benign global macroeconomic trends buoyed U.S. stocks. Corporate earnings had surpassed expectations, fueling hopes for even higher dividend payouts and stock buybacks. Investors' perception of negligible levels of risk was manifested through record-low levels of equity volatility (as measured by the VIX index) and a sharp narrowing of corporate credit spreads.

5.0% ⬆ 5.5%

Effective December 31, 2018

The optimism in equity markets persisted into late 2017 and early 2018, after the passage into law of the largest U.S. corporate tax reform in over 30 years. The Tax Cuts and Jobs Act, enacted on December 22, 2017, cut both personal income tax rates (temporarily through 2025) and the statutory corporate tax rate from 35% to 21% (permanently), among many other provisions. While not all industries were anticipated to be net beneficiaries from the U.S. tax reform, investors appeared to be expecting on average a substantial increase in after-tax corporate earnings, which spurred further stock market records. Despite a temporary spike in volatility in February 2018 – partly fueled by concerns that a rise in inflation could lead to an acceleration in interest rate hikes – U.S. equity markets quickly bounced back, reaching new record highs in September 2018.

From October through December 2018, the picture that emerged was very different: U.S. stock prices suffered significant losses, with an accompanying surge in equity volatility and a widening of corporate credit spreads. Broad U.S. stock market indices ended 2018 with negative total returns, the worst performance since 2008 at the height of the global financial crisis. The deterioration in risk

sentiment appears to be primarily attributable to the perceived fast pace in monetary policy tightening by the Federal Reserve, signs that global economic growth may be decelerating (particularly in China), and trade disputes between the U.S. and China. The unknown outcome of Brexit negotiations, and other geo-political risks appeared to add to the uncertainty. The fact that U.S. macroeconomic trends are still very positive, with strong U.S. real GDP growth and historically low unemployment levels, was insufficient to offset the rise in investors' risk aversion.

Duff & Phelps goes beyond historical measures of ERP by examining approaches that are sensitive to the current economic and financial market conditions. In the following table, we list the primary factors considered when arriving at the Duff & Phelps recommended U.S. ERP. We document the evolution of these factors from December 31, 2017 through December 31, 2018, along with the corresponding relative impact on ERP indications.

Factors Considered in the U.S. ERP Recommendation:
Relative Change from December 2017 to December 2018

Factor	Change	Effect on ERP
U.S. Equity Markets	↓	↑
Implied Equity Volatility	↑	↑
Corporate Credit Spreads	↑	↑
Economic Policy Uncertainty (EPU) and Equity Uncertainty Indices	↑	↑
Historical Real GDP Growth and Forecasts	↑	↓
Unemployment Environment	↔	↔
Consumer Confidence	↔	↔
Business Confidence	↓	↑
Sovereign Credit Ratings	↔	↔
Damodaran Implied ERP Model	↑	↑
Default Spread Model	↑	↑

For more information, and to review the upcoming Duff & Phelps' client alert on this topic, visit: www.duffandphelps.com/costofcapital or contact:

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Duff & Phelps Transaction Trail 2018 Report

Duff & Phelps recently released the annual edition of **Transaction Trail 2018**, the flagship publication of Duff & Phelps' South East Asia practice. The report takes an in-depth look at transaction and capital markets activities, including mergers and acquisitions ("M&A"), private equity ("PE") and venture capital ("VC") investments as well as initial public offerings ("IPOs"), in Singapore, Malaysia and Indonesia (the "Region") over the course of 2018.[1]

Key highlights of the report:

Total activity valued at US$136 billion

In 2018, the region recorded total deal activity valued at over US$136 billion spread across 1,419 deals, with over 15 transactions valued at more than one billion dollars each. Globally, over 39,000 deals valued at over US$3.5 trillion were registered in the same period.[2]

Singapore Continues to Lead Deal Making in the Region

Singapore recorded a total of 857 deals (M&A, PE/VC and IPOs) worth US$106.2 billion for 2018 as compared to 842 deals worth US$101.9 billion for 2017. M&A comprised the bulk of the deal volume in Singapore, constituting 688 deals valued at US$99 billion in 2018, compared to 698 deals valued at US$75.4 billion in 2017.

In 2018, there were a total of 458 cross-border M&A deals in Singapore registering US$89.1 billion. The bulk of total deal value came from 315 outbound transactions (Singapore-based companies or Soverign Wealth Funds acquiring overseas companies) worth US$81.1 billion contributing to over 82% of the total deal value in 2018 for M&A deals. Domestic transactions contributed to 10% of total M&A deal value with 230 deals valued at US$9.9 billion in 2018.

Highest Yearly Transacted Volume of PE/VC Deals in Singapore in 2018

PE/VC investments in Singapore companies achieved record deal volume with 154 PE/VC investments in 2018 as compared to 125 investments in 2017. Total PE/VC investments in Singapore accounted for US$6.6 billion in deal value for 2018. While this was below the record high of US$22.8 billion achieved in 2017 (which was driven by sizeable PE/VC buyouts, including the privatization of Global Logistic Properties Ltd. and the acquisition of Equis Energy), the total deal value in 2018 is significantly higher than in the years prior to 2017. Notable PE/VC investments in 2018 for Singapore include, the US$2.5 billion investment in GrabTaxi Holdings Pte Ltd. by Toyota Motor Corp and other consortium investors, and the privatization of Tat Hong Holdings Ltd. by Standard Chartered Private Equity Ltd.

Indonesian IPO Market Witnesses a Record Level of Listings

IPO listings in Singapore for 2018 were significantly below 2017 levels, with a total of 15 IPOs and capital raised on the Singapore Exchange, amounting to US$523 million compared to19 IPOs in 2017 which raised US$3.7 billion (which was driven by the sizeable listing by Netlink Trust). Elsewhere, the Indonesia IPO market recorded a new high for IPO listings over the past five years, with a total of 57 listings raising capital of US$1.1 billion during 2018, compared to US$625 million during 2017.

Technology Sector Remains the Key Driver of PE/VC Deals in the Region

Over the past four years, the technology sector has been one of the largest contributors to PE/VC deals in the region. PE/VC investments into technology companies has grown approximately 10 times from US$672 million in 2015 to US$6.5 billion in 2018. In addition to the sizeable investment in GrabTaxi Holdings mentioned above, the other top deals in the technology sector included the US$1.7 billion investment in Go-Jek by Dianping.com, KKR, Tencent and other consortium investors, and the US$1 billion investment in Tokopedia by SoftBank Group and other consortium investors, reflecting positive investor interest in the sector.

M&A in Indonesia Fairly Active with Notable Domestic Transactions, Malaysian Deal Activity Lower

M&A activity in Indonesia reached a record of US$15.1 billion in deal value in 2018 compared to US$6.6 billion in 2017, driven by large transactions in the materials, BFSI and energy sectors. Malaysia has seen a significant reduction in deal activity with total deals in M&A, PE/VC and IPO valued at US$12.5 billion in 2018 compared to the record levels last year with deal values at US$20.3 billion. This could be due to political changes and businesses taking a wait-and-watch approach on strategic growth initiatives. However, momentum has picked up toward the end of the year with a few notable transactions in Malaysia's Healthcare sector, such as the acquisition by Mitsui & Co Ltd of a 16% stake in IHH Healthcare Bhd for US$2.0 billion.

Read the complete report here.

For more details on the report, please contact:
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1. December 2017 to November 2018
2. Source: Bloomberg (1 December 2017 to 30 November 2018)

Duff & Phelps
Cost of Capital Navigator – New Features

The Duff & Phelps Cost of Capital Navigator is an online application that guides the analyst through the process of estimating cost of capital, a key component of any valuation analysis.

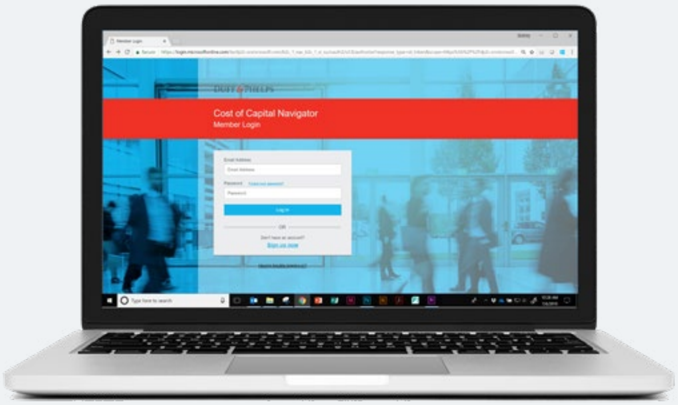
When Duff & Phelps launched the Cost of Capital Navigator platform in early 2018, it included the U.S. size premia, industry risk premia, equity risk premia, risk-free rates, and other essential valuation data previously published in the Duff & Phelps *Valuation Handbook – U.S. Guide to Cost of Capital from 2014 to 2017*, and prior to that published in the *Ibbotson Associates/Morningstar Stocks, Bonds, Bills, and Inflation® (SBBI®) Valuation Yearbook* and the *Duff & Phelps Risk Premium Report.*[1]

In early 2019, Duff & Phelps is adding five new features to the Cost of Capital Navigator that will provide significant benefits to users of the platform in the form of additional data, information and enhanced functionality. These new features are free to all Cost of Capital Navigator subscribers.

New Features Added in Early 2019

Size Premia and Breakpoint Tables Are Now Viewable: Cost of Capital Navigator subscribers indicated to us that being able to see the full CRSP Deciles Size Study and Risk Premium Report size premium tables and risk premium tables, along with the "breakpoints" (i.e., upper and lower bounds) of the deciles and portfolios in these tables, would better assist them when selecting the appropriate size premium or risk premium for their subject company. Starting in 2019 these tables are:

- **Viewable** within the Cost of Capital Navigator in the same screen (step) where the user selects the size premium or risk premium that is most appropriate for their subject company.
- **Included** in the Navigator's PDF outputs for support and audit review purposes.



The Cost of Capital Navigator includes the size premia and risk premia data for both of these critical valuation data sets back to 1999, and will present the user with the appropriate year's tables based upon the valuation date the user selected.

Excel Add-in: This powerful new tool enables Cost of Capital Navigator users to directly import Duff & Phelps cost of capital data (size premia, equity risk premia, risk free rates, betas, industry risk premia and more) into their own Excel spreadsheets.

Industry Snapshot: The Cost of Capital Navigator Resources section will include a new "Industry Snapshot" which provides key industry-level data (e.g., industry-level cost of equity capital estimates, betas, valuation multiples, etc.) from the Valuation Handbook – *U.S. Industry Cost of Capital*, as of the user's valuation date for the industry in which the subject company operates. This important contextual data can help financial professionals benchmark, augment, and support their own custom analysis of the subject company and its industry.

WACC Estimate: Starting in 2019, users can incorporate their cost of equity capital estimates into a weighted average cost of capital (WACC) computation.

1. Prior years' CRSP Decile Size Study and Risk Premium Report Study valuation data available in the online Cost of Capital Navigator is "as published". This means that this data appears just as it was published in the Duff & Phelps Valuation Handbook – *U.S. Guide to Cost of Capital* (2014–2017), the Ibbotson Associates/Morningstar *Stocks, Bonds, Bills, and Inflation® (SBBI®) Valuation Yearbook* (1999–2013), and the Duff & Phelps *Risk Premium Report* (1999–2013). Used with permission. The data in the Cost of Capital Navigator is updated regularly.

Enhanced Outputs: In 2019, "Enhanced Outputs" provide robust and comprehensive documentation of the user's cost of capital assumptions, sources, analysis, and results. The enhanced reports will be available as an export to PDF and Excel.

What's Coming Next?

The Duff & Phelps Cost of Capital Navigator currently includes two essential valuation data sets (the CRSP Deciles Size Premia Study and Risk Premium Report Study) used by financial professionals to develop U.S.-based cost of capital estimates.

Later in 2019 and 2020, Duff & Phelps will add data sets to the Cost of Capital Navigator that include comprehensive U.S. and international industry statistics for hundreds of global industries, international valuation data that includes historical equity risk premia for sixteen different countries, and country risk premia (based upon the sovereign yield spread model and the country credit rating model) for over 180 countries.

To learn more about the Cost of Capital Navigator and other Duff & Phelps valuation and industry data products, visit dpcostofcapital.com.

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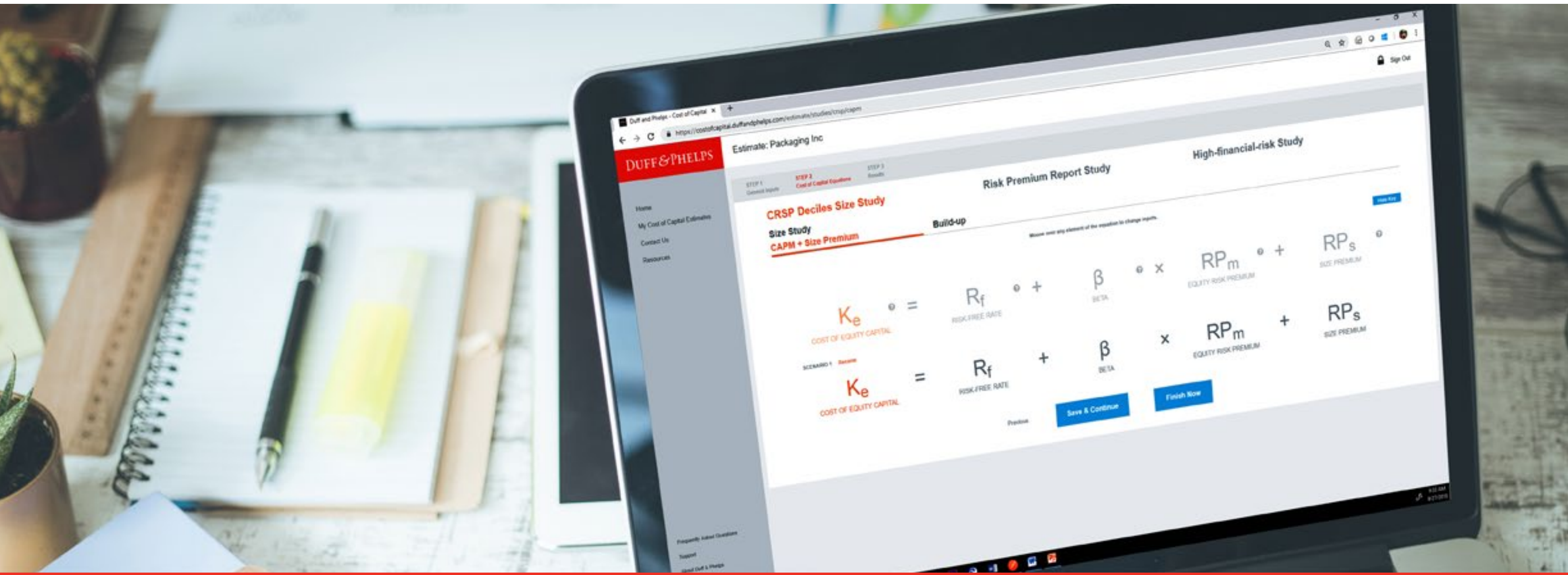

Cost of Capital Navigator – Pricing and New Features for 2019

The Duff & Phelps Cost of Capital Navigator is an online application that guides the analyst through the process of estimating cost of capital, a key component of any valuation analysis. We are excited to share our pricing and new features for 2019.

	Basic		Pro		Enterprise
	First User	Additional Users	First User	Additional Users	16+ Pro Users
2019 Pricing	$295	$129	$595	$299	Contact Us
Data Years Included* (CRSP Deciles Size Study & Risk Premium Report Study)	2018–2019		1999–2019		1999–2019
Intra-year Updates*	2018–2019		2014–2019		2014–2019
Theory, Methodology & Examples	✓		✓		✓
Full Size Premia Tables (new)	✓		✓		✓
Excel Add-in (new)	✓		✓		✓
Estimate WACC (new)	✓		✓		✓
U.S. Industry Snapshot (new)	✓		✓		✓
Enhanced Outputs (PDF and Excel) (new)	✓		✓		✓
Personal Training and Onboarding Assistance					✓

*2019 Data Year includes year-end 2018 data (delivery in February, 2019), plus intra-year updates.

To learn more about the Cost of Capital Navigator, visit:
dpcostofcapital.com

North American Industry Market Multiples

AS OF DECEMBER 31, 2018

Industry	Market Value of Equity to Net Income		MVIC to EBIT		MVIC to EBITDA	
	U.S.	Canada	U.S.	Canada	U.S.	Canada
Energy	9.6	13.0	15.2	16.3	8.4	7.0
Energy Equipment & Services	10.6	14.2	13.5	15.9	8.6	7.3
Integrated Oil & Gas	11.8	—	—	—	—	—
Materials	10.3	9.6	12.4	10.9	8.2	6.8
Chemicals	15.2	13.4	12.9	13.2	9.4	8.0
Diversified Chemicals	—	—	—	—	7.3	—
Specialty Chemicals	18.9	—	14.4	—	10.5	—
Construction Materials	14.7	—	18.6	—	10.4	—
Metals & Mining	7.7	9.3	9.4	11.0	6.9	6.7
Paper & Forest Products	6.4	5.7	9.5	5.9	5.3	4.6
Industrials	15.0	15.2	14.2	13.8	10.3	9.5
Aerospace & Defense	17.9	13.3	15.2	21.6	12.1	12.7
Industrial Machinery	21.6	19.4	15.4	23.5	11.0	19.2
Commercial Services & Supplies	16.3	17.9	16.4	17.6	9.9	9.9
Road & Rail	8.4	—	14.0	—	7.0	11.3
Railroads	8.7	—	14.5	—	10.4	—
Consumer Discretionary	13.7	14.5	13.7	13.8	9.3	9.1
Auto Parts & Equipment	11.5	—	10.3	—	6.4	—
Automobile Manufacturers	—	—	—	—	7.5	—
Household Durables	10.0	—	10.6	—	9.4	—
Leisure Products	15.7	—	11.6	—	9.3	—
Textiles, Apparel & Luxury Goods	16.3	23.8	12.4	17.4	9.5	14.1
Restaurants	16.7	15.9	17.2	14.3	10.3	13.1
Broadcasting	4.4	—	11.2	—	8.4	5.2
Cable & Satellite	6.4	—	15.4	—	9.4	—
Publishing	25.4	—	14.9	—	9.3	—
Multiline Retail	11.0	—	11.3	—	6.8	—

Industry Market Multiples are available online!
Visit www.duffandphelps.com/multiples

Industry	Market Value of Equity to Net Income		MVIC to EBIT		MVIC to EBITDA	
	U.S.	Canada	U.S.	Canada	U.S.	Canada
Consumer Staples	15.9	18.9	16.8	17.6	12.0	11.7
Beverages	22.2	19.2	23.6	35.2	15.0	13.3
Food Products	16.2	14.1	17.1	17.0	12.2	11.3
Household Products	23.0	—	17.4	—	13.7	—
Health Care	26.2	26.0	20.8	18.8	15.0	11.8
Health Care Equipment	40.5	—	28.2	—	21.1	—
Health Care Services	20.2	—	14.5	—	9.9	—
Biotechnology	21.2	—	16.4	—	16.0	—
Pharmaceuticals	8.8	29.3	14.8	25.0	12.5	16.1
Information Technology	21.8	24.0	21.2	16.5	15.0	18.7
Internet Software & Services	26.7	19.3	31.2	12.9	25.0	11.0
IT Services	21.3	—	18.7	—	12.8	15.1
Software	40.4	49.4	33.1	44.8	25.7	27.7
Technology Hardware & Equipment	16.7	24.0	17.6	14.5	12.3	13.7
Communications Equipment	23.4	53.5	23.5	27.2	17.6	18.7
Technology Hardware, Storage & Peripherals	9.7	—	15.2	—	10.3	—
Semiconductors	27.6	—	22.3	—	18.3	—
Telecommunication Services	9.2	—	18.2	—	7.7	8.8
Integrated Telecommunication Services	7.5	—	13.2	—	6.7	—
Wireless Telecommunication Services	10.0	—	31.9	—	7.7	—
Utilities	19.9	16.2	21.0	18.4	12.3	10.5
Electric Utilities	19.9	—	20.1	—	11.5	—
Gas Utilities	17.4	—	19.4	—	11.3	—

Industry	Market Value of Equity to Net Income		Market Value of Equity to Book Value	
	U.S.	Canada	U.S.	Canada
Financials	14.1	9.3	1.2	1.0
Banks	14.3	8.5	1.2	1.3
Investment Banking & Brokerage	13.1	—	1.6	0.7
Insurance	12.6	9.5	1.4	1.0

The Tax Cuts and Jobs Act ("Act"), which was enacted on December 22, 2017, had a significant one-time impact on the net income of many U.S. companies that was reported after that date. As a result, U.S. Net Income multiples may have been temporarily, but materially impacted by some of the provisions in the Act and, which might require specific-company adjustments not reflected in the multiples reported herein. An industry must have a minimum of 5 company participants to be calculated.

For all reported multiples in the U.S. and Canada, the average number of companies in the calculation sample was 77 (U.S.), and 29 (Canada); the median number of companies in the calculation sample was 40 (U.S.), and 12 (Canada). Sample set includes publicly-traded companies (private companies are not included). Source: Data derived from Standard & Poor's Capital IQ databases. Reported multiples are median ratios (excluding negatives or certain outliers). MVIC = Market Value of Invested Capital = Market Value of Equity plus Book Value of Debt. EBIT = Earnings Before Interest and Taxes for latest 12 months. EBITDA = Earnings Before Interest, Taxes, Depreciation and Amortization for latest 12 months. Note that due to the exclusion of negative multiples from the analysis, the number of companies used in the computation of each of the three reported multiples across the same industry may differ, which may occasionally result in a counterintuitive relationship between those multiples (e.g. the MVIC-to-EBITDA multiple may exceed MVIC to EBIT).

European Industry Market Multiples

AS OF DECEMBER 31, 2018

Industry	Market Value of Equity to Net Income	MVIC to EBIT	MVIC to EBITDA
	Europe	Europe	Europe
Energy	12.0	15.7	9.1
Energy Equipment & Services	15.6	19.3	12.3
Integrated Oil & Gas	10.5	9.7	6.3
Materials	12.8	13.2	8.3
Chemicals	18.2	15.0	9.9
Diversified Chemicals	11.5	11.1	7.0
Specialty Chemicals	19.7	15.3	11.5
Construction Materials	11.7	13.4	8.5
Metals & Mining	7.9	9.8	6.3
Paper & Forest Products	10.8	13.1	8.3
Industrials	14.6	14.0	9.9
Aerospace & Defense	19.2	16.5	12.2
Industrial Machinery	16.0	13.5	10.1
Commercial Services & Supplies	16.7	15.1	9.9
Road & Rail	10.9	14.8	8.6
Railroads	12.6	19.1	8.7
Consumer Discretionary	14.4	13.5	9.5
Auto Parts & Equipment	7.9	9.9	6.6
Automobile Manufacturers	8.5	17.2	11.3
Household Durables	12.7	11.7	8.8
Leisure Products	19.5	13.8	11.6
Textiles, Apparel & Luxury Goods	14.6	14.4	11.0
Restaurants	19.7	15.6	10.8
Broadcasting	13.6	9.4	7.6
Cable & Satellite	17.9	15.6	6.7
Publishing	10.3	13.0	9.2
Multiline Retail	13.0	9.5	8.0

Industry	Market Value of Equity to Net Income	MVIC to EBIT	MVIC to EBITDA
	Europe	Europe	Europe
Beverages	21.1	19.0	13.2
Food Products	16.9	14.6	10.4
Household Products	17.9	16.0	11.2
Health Care	25.7	21.0	15.1
Health Care Equipment	27.9	25.8	17.6
Health Care Services	17.3	17.7	11.2
Biotechnology	25.3	21.0	21.9
Pharmaceuticals	19.0	18.4	14.0
Information Technology	19.8	16.9	12.7
Internet Software & Services	24.9	22.6	16.7
IT Services	18.6	14.6	11.5
Software	27.5	22.8	17.7
Technology Hardware & Equipment	15.4	14.7	11.0
Communications Equipment	22.8	19.3	14.2
Technology Hardware, Storage & Peripherals	18.7	15.1	11.2
Semiconductors	16.1	17.1	10.3
Telecommunication Services	20.9	18.0	8.6
Integrated Telecommunication Services	18.0	16.3	8.2
Wireless Telecommunication Services	32.0	18.4	8.0
Utilities	14.0	18.0	10.6
Electric Utilities	14.0	19.1	10.9
Gas Utilities	13.0	15.1	10.3

Industry	Market Value of Equity to Net Income	Market Value of Equity to Book Value
	Europe	Europe
Financials	10.1	1.0
Banks	8.3	0.6
Investment Banking & Brokerage	15.3	1.4
Insurance	11.6	1.1

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An industry must have a minimum of five company participants to be calculated. For all reported multiples in Europe, the average number of companies in the calculation sample was 90 and the median number of companies in the calculation sample was 39. Sample set includes publicly-traded companies (private companies are not included). Source: Data derived from Standard & Poor's Capital IQ databases. Reported multiples are median ratios (excluding negatives or certain outliers). MVIC = Market Value of Invested Capital = Market Value of Equity plus Book Value of Debt. EBIT = Earnings Before Interest and Taxes for latest 12 months. EBITDA = Earnings Before Interest, Taxes, Depreciation and Amortization for latest 12 months. Note that due to the exclusion of negative multiples from the analysis, the number of companies used in the computation of each of the three reported multiples across the same industry may differ, which may occasionally result in a counterintuitive relationship between those multiples (e.g. the MVIC-to-EBITDA multiple may exceed MVIC to EBIT).

UPCOMING EVENTS

FEBRUARY 21 - 22

IFA USA

Washington, D.C.

FEBRUARY 25 - 28

TP Minds Americas

Miami, Florida

MARCH 6

Bridging the Divide Webcast:
Valuations for Financial Reporting and Transfer Pricing

MARCH 14

Deciphering the Nav: Challenges in Pricing Secondary Market Funds Interest Transactions

London, England

MARCH 24 - 27

UPPO Annual Conference

New Orleans, Louisiana

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