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Survey of Valuation Professionals:
Valuation Techniques in Practice

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Content

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Overview

▸ This report is based on the SFI working paper '**The Choice of Valuation Techniques in Practice: Education versus Profession**' by K.G. Nyborg and L. Mukhlynina and summarizes results from a survey conducted in 2012. http://papers.ssrn.com

▸ **Unique feature** of our survey: Focus on valuation professionals, not CFOs, in-depth exploration of implementation, not just the choice of valuation method.

▸ **Main objective:** To learn about valuation professionals' choices and implementation of valuation techniques in practice.

▸ **Survey design:** Allows us to control for professional subgroup (consulting, investment banking, private equity, and asset management), education, experience, and various valuation purpose characteristics.

▸ **Questionnaire:** Part 1 asks a series of background and personal questions that relate to the purpose of valuation, educational level achieved, experience, gender, and so on. Part 2 and 3 focus on relative valuation and multiperiod models. The 4th part concludes with some general questions that further elucidates a respondent's preferred valuation approach. Full details are in the survey questionnaire which can be found on one of the authors' webpage: www.nyborg.ch.

Overview
Questionnaire Design

▸ Replies to multiple choice questions on a scale from "Never" (0) to "Always" (4).

Example:

▸ What side of the investment are you usually on?

Never   **Always**

0   **1**   **2**   **3**   **4**
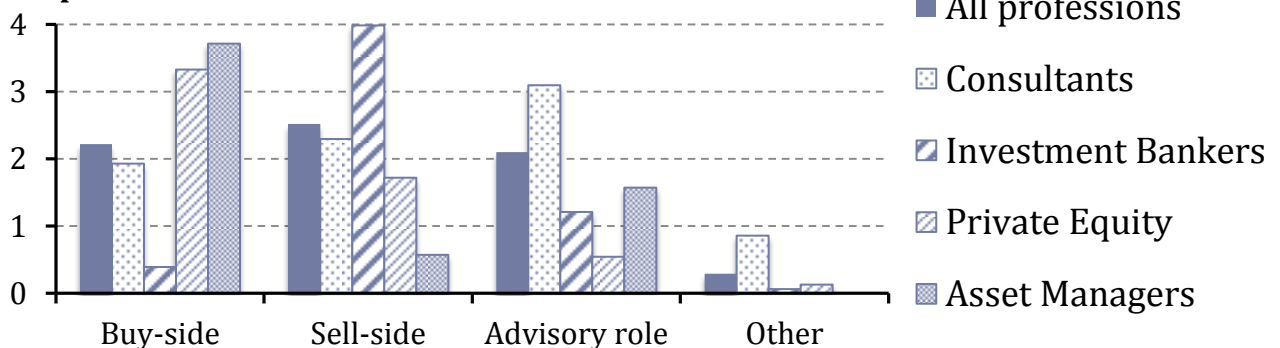
                        a. I am on the buy-side

                        b. I am on the sell-side

                        c. Advisory role

                        d. Other, please specify …

▸ Thus, the numbers 0 – 4 indicate the <u>strength of response</u>. We report mean strength of response.

▸ Example:

Overview of Findings
Highlights

- Most respondents use both, multiples and DCF. But there exists substantial variation across respondents.

- Profession matters more than education with respect to choice.

- Cluster analysis shows that valuation purpose characteristics are not so important. Experience is also not very important.

- These points support the "sociological hypothesis:" Different professions have different valuation cultures.

- There exists confusion with respect to interest tax shields and the WACC. Higher education levels do not reduce the confusion.

Overview of Findings
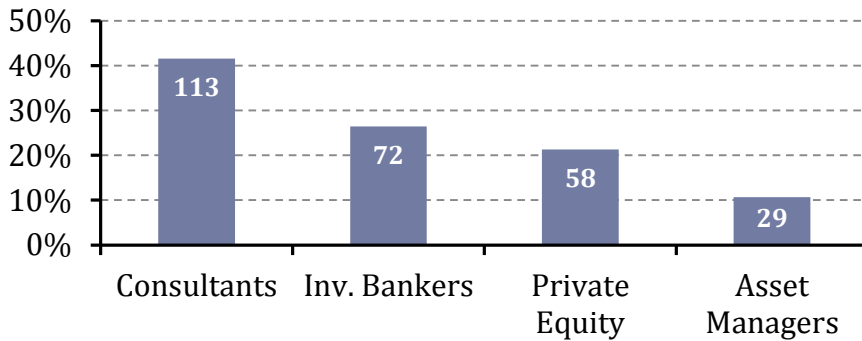## More Details: Most Popular Choices

‣ **Multiples**

   ‣ **EV/EBITDA** (84% use it always or almost always when using multiples).

   ‣ **12-month forward** estimates of earnings.

   ‣ **8 comparables** picked primarily from rivals in the same industry, taking into account size and expected growth.
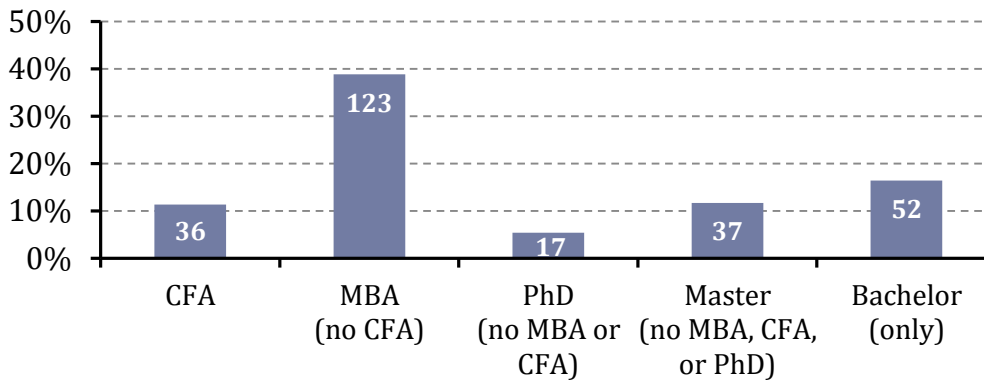
‣ **DCF**

   ‣ Respondents typically discount expected cash flows at the **WACC** with the **cost of debt** estimated by the riskfree rate plus a spread and the **cost of equity** being estimated by the CAPM.

   ‣ **Riskfree rate:** yield on a long-term Treasury security.

   ‣ **Cash-flow** forecasting horizon: 5 years.

   ‣ **Terminal value:** Gordon growth model, with growth rate, g, being 2%, the inflation rate, or the GDP growth rate.

   ‣ With the choices above and realistic values for the WACC, the fraction of the total gross value of a project that can be attributed to the terminal value is around 70%!

   ‣ On the whole, respondents do not exhibit a deep understanding of how to deal with tax shields when they carry out a DCF analysis.

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Background
Participants

▸ Profession

Profession chart (percentages):
- Consultants: ~41% (113)
- Inv. Bankers: ~26% (72)
- Private Equity: ~21% (58)
- Asset Managers: ~10% (29)

▸ Education

Education chart (percentages):
- CFA: ~11% (36)
- MBA (no CFA): ~39% (123)
- PhD (no MBA or CFA): ~5% (17)
- Master (no MBA, CFA, or PhD): ~11% (37)
- Bachelor (only): ~16% (52)

▸ Experience

  ▸ 62% with more than 10 years of experience
  ▸ 31% with 4 – 10 years
  ▸ 7% with up to 3 years

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Background
Investment Characteristics

▸ Sector focus
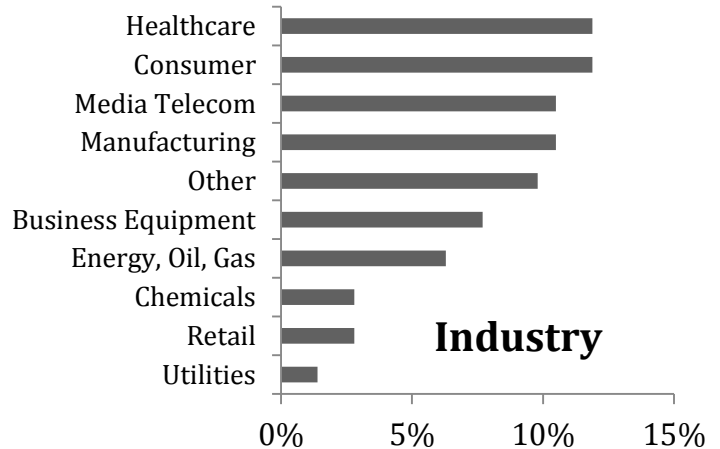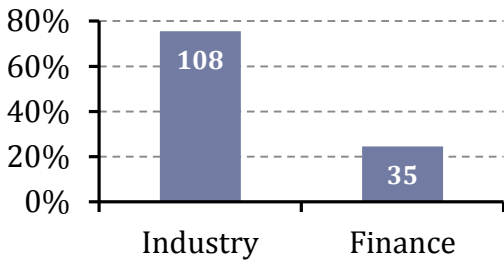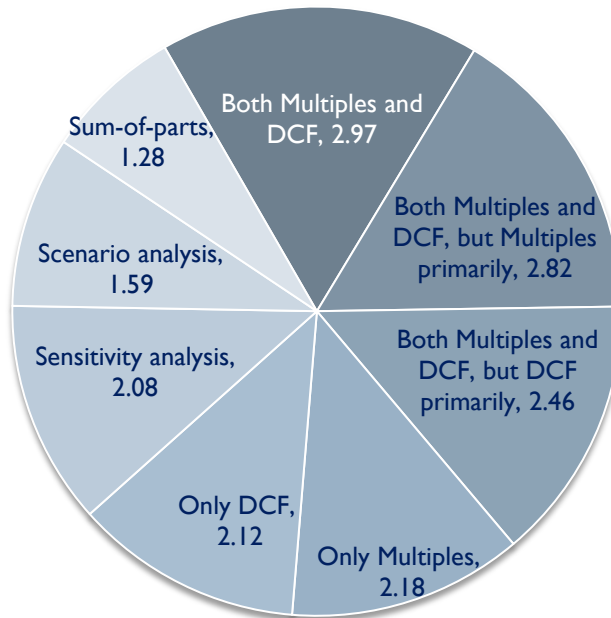

▸ Regional focus

▸ Firm size focus

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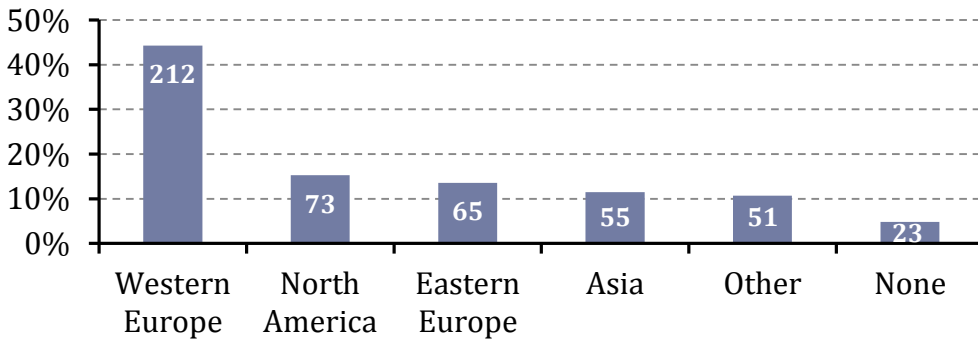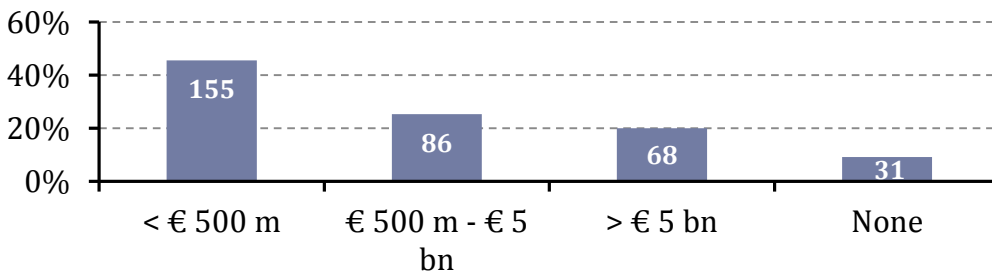
Findings
Multiples vs. DCF

Strength of response

- Most respondents use both methods.

- 47% of respondents almost always or always use both methods, but primarily multiples. 46% use both methods, but primarily DCF.

- The main reason cited for not using DCF is cash-flows uncertainty.

- Consultants are more likely to use both approaches, while private equity professionals are less likely, preferring multiples.

- Respondents whose highest degree is Master or who are more experienced are relatively more likely to use both approaches while MBAs are less likely.

- Sensitivity and scenario analysis are commonly used (68% and 57%, respectively, almost always or always).

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Findings
Multiples

▸ Most popular multiple is EV/EBITDA (84% use it almost always or always). Especially favored by consultants and PE professionals. Consistently popular across all education levels and both experience levels (≷ 10 years).

▸ Asset managers and investment bankers are heavy users of P/Es.

▸ Industry-specific multiples are more popular among consultants.

▸ Respondents use both, forward looking and trailing multiples, but favor the former. 80% of respondents strongly prefer 12-month forward multiples, and 55% use trailing multiples. 24-month forward multiples are rarely used.
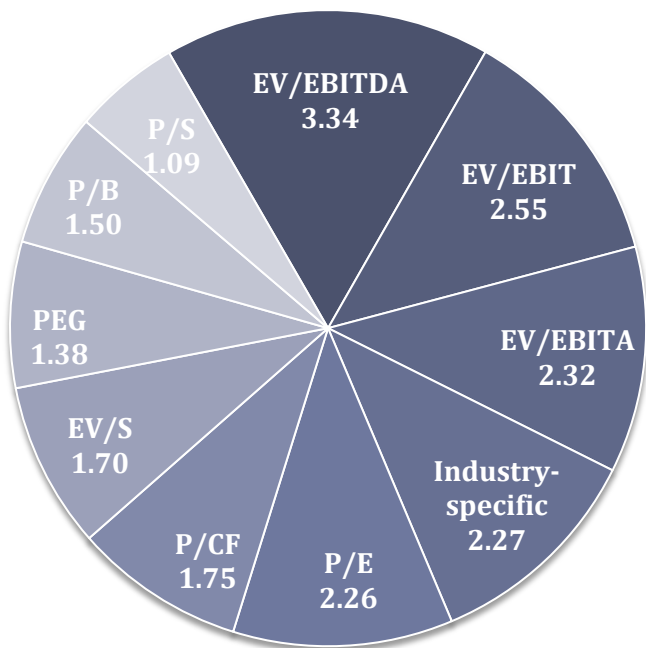
Strength of response

▸ For 89% of respondents industry sector affects the choice of multiple.

▸ For 70% of respondents earnings and margins stability affect the choice.

▸ For 59% capital intensity affects the choice.

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Findings
Choosing Comparables

▸ Around 8 comparables are used on average.

▸ 60% of respondents use Bloomberg comp set some of the time.

▸ Factors that affect the choice of comps are rivals (91%) and firms in the same industry (89%).

Strength of response
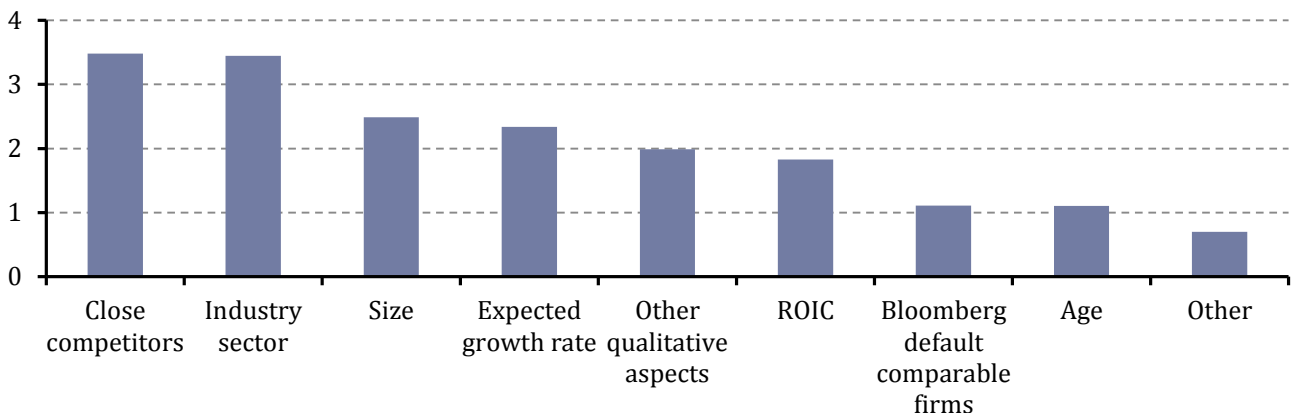
Choice of Multiple and Comparables Matter: Example

▸ The performance of multiples depends on the set of comparables.

▸ While EV/EBITDA is the most popular multiple, it does not necessarily performs the best.

▸ Which multiple performs the best may vary over time.

Example

▸ Green Mountain Coffee Roasters (now Keurig).

▸ Sets of comparables: (1) All Bloomberg comparables, (2) 50% largest by EV, (3) 50% smallest.

Enterprise value valuation errors (in $mill)

	EV/EBITDA		EV/EBIT		P/E		P/B	P/CF	
	Trail.	Forw.	Trail.	Forw.	Trail.	Forw.		Trail.	Forw.
Panel A: Green Mountain at 14.02.2014									
Bloomberg	3,280	3,199	3,665	2,887	5,536	6,189	5,725	2,430	7,204
Large	3,289	2,865	3,601	2,434	5,788	6,398	6,498	5,423	7,765
Small	3,272	3,490	3,720	3,282	5,315	6,007	5,049	563	6,642
Panel B: Keurig at 24.02.2015									
Bloomberg	1,487	1,116	1,171	818	5,299	3,904	2,524	8,499	4,553
Large	1,606	182	2,069	315	4,793	3,535	831	8,383	3,142
Small	1,352	2,600	25	2,328	5,975	4,307	6,358	8,632	6,433

▸ The true EV of Keurig Green Mountain: 15,900 $mill on 14.02.2014; 18,672 $mill on 24.02.2015.

▸ The numbers in squares are the highest and the lowest valuation errors (in absolute terms).

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Findings
Multiperiod Models

‣ DCF is by far the most popular method (76% use it almost always or always when using multiperiod models).

‣ However PE professionals favor IRR, which is the second most popular choice overall.
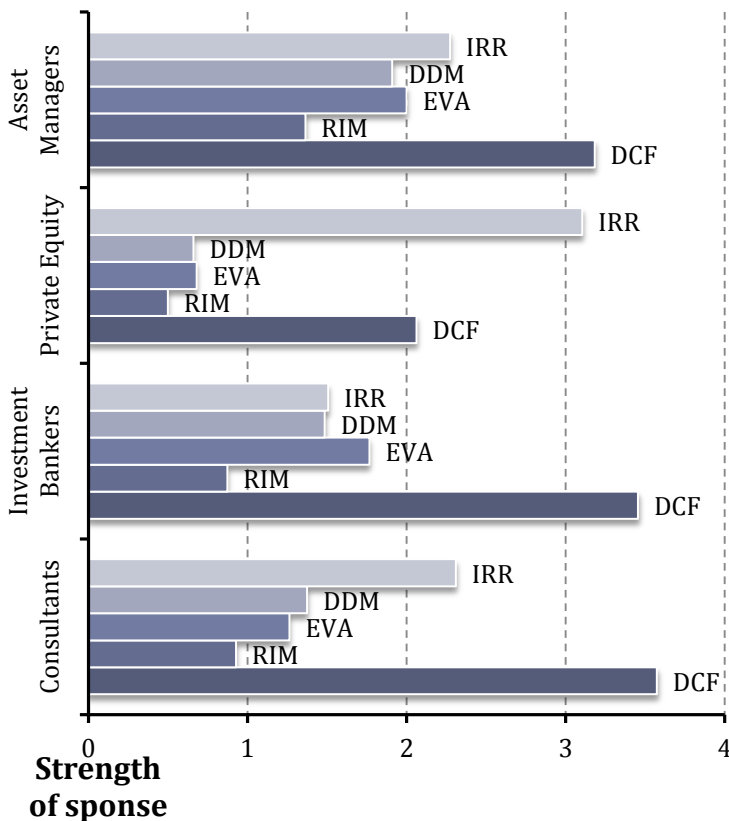
‣ Within DCF valuation, professionals calculate NPV, rather than APV. They do so by discounting cash flows at the WACC.

‣ While WACC is sensitive to leverage because of the tax shields, only 48% take debt policy into account.

‣ This indicates confusion among many valuation professionals with respect to the WACC, debt policies, and tax shields.

‣ Higher education levels do not reduce the confusion.

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Findings
DCF: Forecasting Horizon and Terminal Value

‣ The overwhelmingly most popular choice for terminal value estimation is the Gordon growth model (78%).

‣ However, PE professionals prefer using multiples.

Strength of response
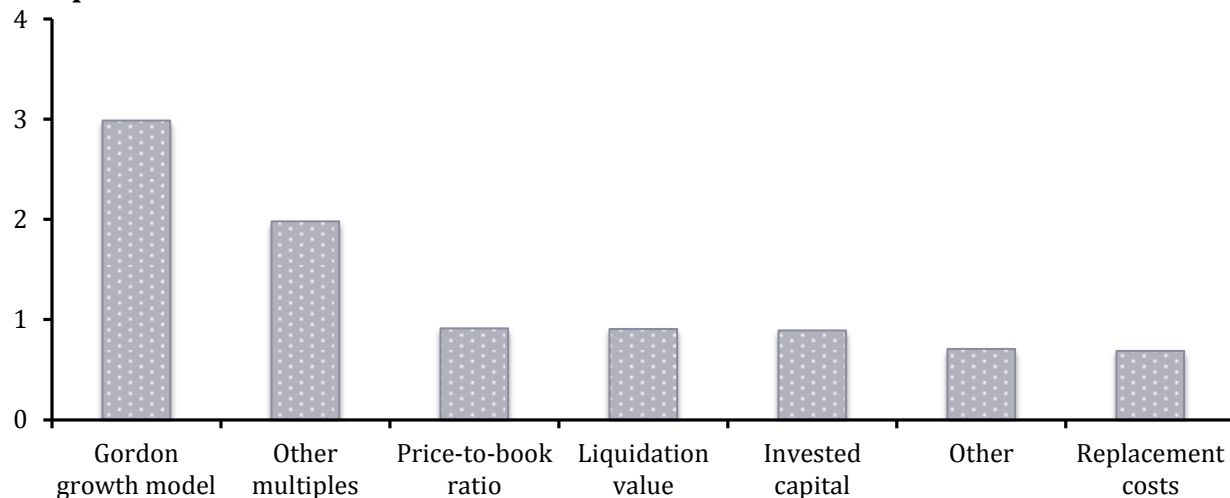
‣ The most common choice of forecasting horizon is 5 years.

‣ But investment bankers tend to project cash flows for 10 years.

‣ In the Gordon growth model, professionals mostly use 2%, the inflation rate, or the GDP growth rate.

‣ There is some variation across the different subpopulations. For example, PE professionals prefer the inflation rate, while CFAs favor the GDP growth rate.

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Terminal Value as a Fraction of Total Value: Example

			Forecasting horizon								
			5 years			8 years			10 years		
			Forecasting period growth rate								
			2%	4%	6%	2%	4%	6%	2%	4%	6%
WACC	8%	0%	69%	70%	71%	56%	58%	59%	49%	51%	53%
		2%	75%	76%	77%	63%	65%	67%	56%	59%	61%
		4%	82%	83%	83%	73%	74%	75%	66%	69%	70%
	10%	0%	63%	64%	65%	49%	50%	52%	41%	43%	46%
		2%	69%	69%	70%	55%	57%	58%	47%	49%	52%
		4%	75%	76%	76%	62%	64%	65%	55%	57%	59%

(Row labels under the bracketed "Term. value growth rate")

- Recall valuation professionals' most commonly used scenario:
  - 5 years forecasting horizon
  - 2% terminal value growth rate
- For this scenario and with realistic assumptions about the WACC, the terminal value accounts for 69-77% of the total value.
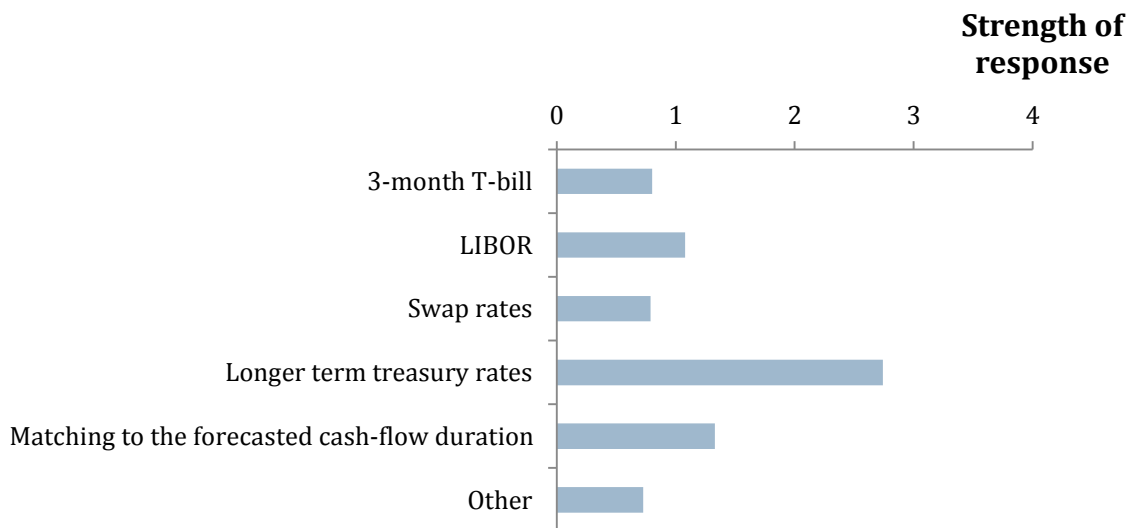
$$Approximately\ 70\%\ of\ Value = \frac{CF_6}{WACC\text{-}g}$$

- **So, in practice, when using DCF, it is almost being reduced to being just another multiples exercise!**

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Findings
Cost of Capital

▸ The most popular approach to calculate cost of debt (72%) is a riskfree rate plus a spread (based on rating and/or duration).

▸ To calculate the cost of equity, 76% of respondents use the CAPM. No other method comes close.

▸ Only 4% of respondents use the Fama and French 3-factor model that is so popular in academic research.

▸ Respondents typically use longer term treasury securities as their **riskfree rate**. Asset managers have a preference for using swap rates.

Chart: Strength of response

Category	Approx. value
3-month T-bill	~0.8
LIBOR	~1.1
Swap rates	~0.8
Longer term treasury rates	~2.8
Matching to the forecasted cash-flow duration	~1.3
Other	~0.8

▸ The average market risk premium is 5.4%.

▸ The highest average is among PE professionals (5.7%), the lowest is among asset managers (4.6%).

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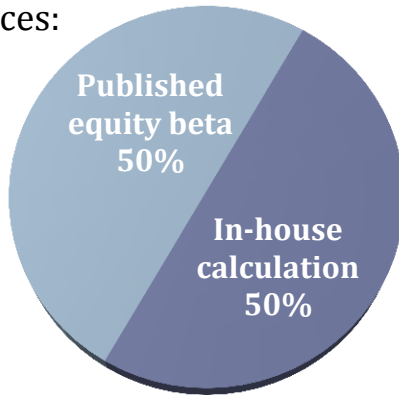
Findings
Confusion: WACC and Interest Tax Shields

- WACC is sensitive to leverage because of interest tax shields.

- Implication: WACC of comparables need to be relevered to the target's leverage.

- When calculating WACCs of the comparables around 28% incorrectly use target weights instead of market weights.

- Half of the respondents incorrectly use market weights instead of target weights when calculating the WACC of the to-be-valued project or firm.

- Only 31% of respondents report that they take future changes in capital structure into account when discounting using the WACC.

- 40% never adjust WACC for anticipated changes in capital structure.

- Having an MBA, CFA, or PhD does not reduce the confusion.

- Although APV would be an ideal procedure to deal with the changes in capital structure, only 44% use this approach sometimes and only 15% almost always or always.

- Personal taxes are almost never taken into account.

- All this points to substantial confusion regarding tax shields and the WACC.

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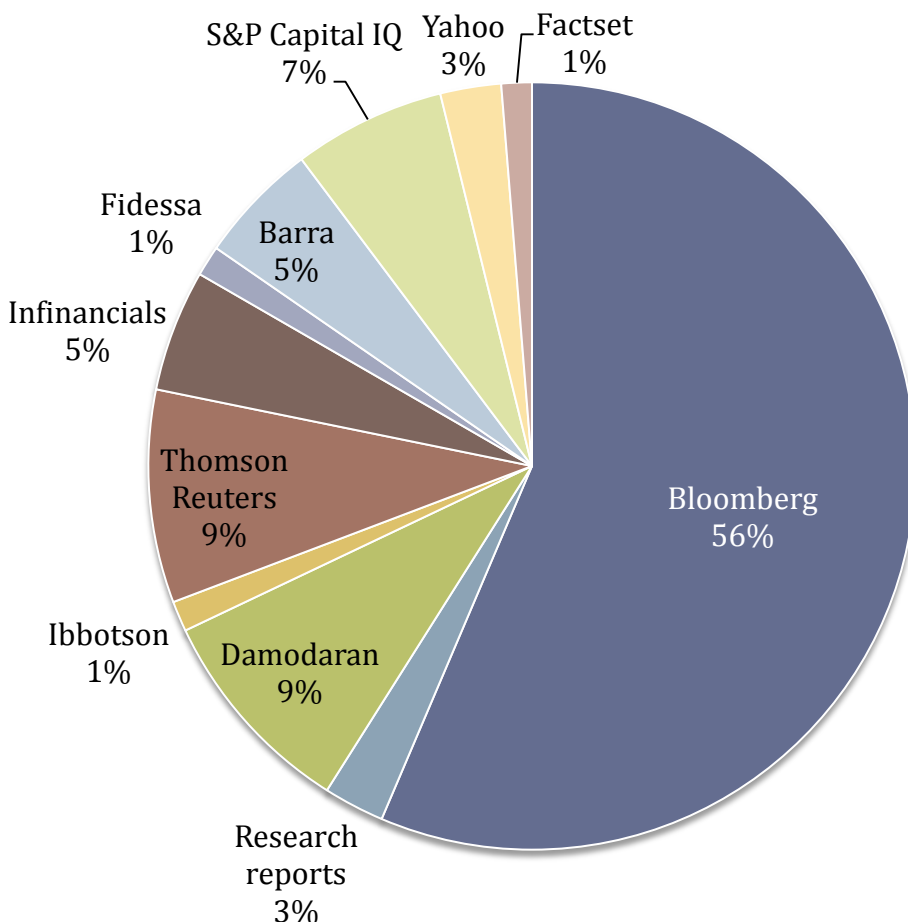
Findings
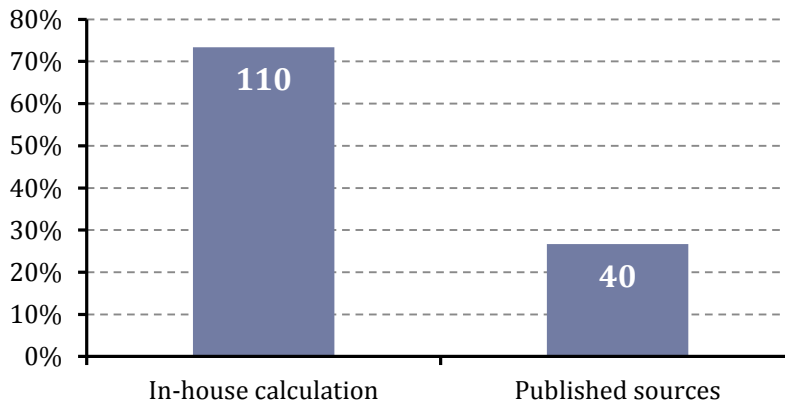## CAPM Beta

- Beta sources:

- Published beta sources:

- While calculating beta in-house, **64%** use the **national stock index**, **23%** use a **regional index**, and **13%** use the **world index** as their market portfolio.

- While calculating beta in-house, **27%** use **beta-smoothing** techniques.

Findings
Market Risk Premium (MRP)

▸ The average market risk premium is 5.41%.

▸ <u>MRP breakdown:</u>

  ▸ Profession

    ▸ **Consultants:** 5.52%, **IB**: 5.28%, **PE**: 5.69%, **AM**: 4.58%

  ▸ Education

    ▸ **BA**: 5.31%, **MA**: 5.69%, **PhD**: 5.72%, **MBA**: 5.50%, **CFA**: 5.10%

  ▸ Experience

    ▸ **<10y**: 5.69%, **>10y**: 5.22%

  ▸ Regional Focus

    ▸ **West. Europe**: 5.20%, **East. Europe**: 5.54%, **North Am**: 5.43%, **Asia**: 5.33%

Concluding Remarks

▸ We find, as one would expect, that there are substantial commonalities in the choice of valuation technique. But there is also a fair amount of variation:

- ▸ **There appear to be distinct valuation cultures among the different valuation professions.**

- ▸ **Not many differences across educational levels.**

- ▸ **Experience has almost no significant effect.**

- ▸ **The purpose of valuation has limited effect on the choice of valuation method.**

- ▸ **There is confusion with respect to interest tax shields and the WACC. Higher education levels do not reduce the confusion.**

- ▸ **In practice, DCF is almost just another multiples exercise.**

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