The Gap between Theory and Practice of Firm Valuation:
Survey of European Valuation Experts*

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Abstract
We survey 356 valuation experts across 10 European countries with CFA or equivalent designation to gain some insights into their valuation practices. We find that while most experts use both Discounted Cash Flow (DCF) and Relative Valuation (RV) models, their assumptions and estimation methods for almost all inputs in models vary widely. For example, 65% (35%) use less (more) than three-year historical data for beta estimation; 58% (42%) use ex-post (ex-ante) market risk premium with subjective size or liquidity risk adjustments; 40% (29%) use market (book) value weights for WACC, and about 50% estimate Terminal Value by discounting a normative cash flow until infinity whereas others employ a decreasing cash flow or a multiple approach. In RV application, Firm Value/EBITDA is the most popular multiple used by 83% of experts, followed by PE (68%), Price-to-Book (45%), Firm Value/EBIT (45%), and Firm Value/Sales (45%). About half of respondents have also modified their discount rate, country risk, or liquidity risk estimation in the wake of the 2008 financial crisis. These wide disparities indicate that two valuation experts could arrive at substantially different valuation estimates, despite using the same model. While most disparities arise because theory provides little guidance on estimation, some are also a result of practitioners not following theoretical guidelines, such as using book value weights or not adjusting historical betas to make them forward looking. Our findings suggest that a serious debate is needed between academics and practitioners to make the valuation framework more “practical”.

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Introduction

How to value a firm (or its assets and equity) is at the heart of most financing and investment decisions. Investment analysts and portfolio managers routinely estimate firm value for investment decisions and financial managers do so for capital budgeting, merger and acquisition, and going public decisions. A firm’s “net worth” and “fair value” are the main ingredients in financial reporting, and regulators and credit agencies rely on them to monitor health of corporations and banks. Given the pervasive role of valuation, one would expect a reasonable consensus among valuation experts about how to estimate firm value since they are trained in the art of valuation and conduct such analyses almost daily. However, anecdotal and professional surveys suggest that valuation estimates can differ widely among experts. Whether these differences arise because experts use different valuation models or make different assumptions when estimating parameters in the models is not clear. In this paper, we survey 365 valuation experts across European countries with CFA or equivalent professional degree to provide some insights into this issue. We focus on the following questions: (1) what valuation models are most popular among experts, (2) how do practitioners estimate inputs required in these models, (3) which inputs are easier to estimate (less dispersion) and which ones are more difficult (more dispersion), and (4) which input differences are more(less) critical for valuation.

We are not the first to survey practitioners about valuation but our study differs from previous surveys in several important ways. First, most prior surveys focus only on a few aspects of valuation, such as cost-of-capital estimation.\(^1\) By contrast, we conduct a comprehensive survey of all aspects of valuation. The study closest to our work is Graham and Harvey (2002)

\(^1\) For previous surveys on cost of capital estimation, see Bruner et al. (1998), Graham and Harvey (2002), Bancel and Mittoo (2011a) and Jacobs and Shivadasni (2013).
who survey U.S. Chief Financial Officers on the theory and practice of several valuation components including cost of capital, capital budgeting, and capital structure. We complement and extend their work by conducting an in-depth investigation of the theory and practice of firm valuation.

Second, most prior surveys focus on whether practitioners follow financial theory, whereas we are more interested in finding out how they estimate key parameters in valuation models. This is an important issue because theory provides little guidance about parameter estimation, forcing practitioners to make their own assumptions that could produce large variations in valuation. Our aim is to identify potential sources of these variations in parameters, such as cost of capital, beta, equity risk premium, that are documented to vary widely in prior studies as well as in components such as future cash flow estimation that have received less attention.\(^2\) We dig deeper in our survey by asking experts questions about not only what valuation models they use but also how they estimate each component in the model. We ask a total of over 50 questions in our survey. Our main objective is to spur a discussion among academics and practitioners about how to shrink these gaps between theory and practice of valuation.

Third, the recent 2007-2008 financial crisis has raised several additional estimation issues that are not addressed in textbooks or in professional training. For example, what should be the risk-free rate in countries with zero or negative real T-bill rate? or in countries facing a sovereign debt crisis? What should be the value of cash and liquid assets during a credit crisis? and how to value future cash flows in times of substantial future uncertainty? There are no clear answers in financial theory for such rare events, and practitioners are forced to deal with these questions on

\(^2\) For surveys on estimation of beta or market risk premium see surveys by Fernandez et al. (2013), Welch (2008) and Graham and Harvey (2007).
their own. We directly ask practitioners how the crisis has affected their valuation practices? In particular, we ask them what equity market risk premium (MRP) they used in each year from 2006 to 2012 to study the impact of crisis on their MRPs. This information would be useful in re-examining theory and estimation practices in the wake of the crisis.

Finally, surveys have several limitations. In particular, surveys measure respondents’ beliefs—not necessarily their actions. The surveys also face the risk that the non-response bias, or differences in respondents’ education or training could influence results. We try to minimize some of these biases by surveying valuation experts, who share a common set of knowledge and training in valuation models. We also collect demographic information about respondents’ profession, education level, experience, and country of work and assess whether their answers differ on any of these dimensions. For example, we will expect that the recent entrants in the industry will be more familiar with the CAPM compared to their peers who have graduated 20 or 30 years ago. Surprisingly, we find little variation on most dimensions.

The remainder of the paper is organized as follows. We first discuss our survey design and then summarize our survey evidence on models and their implementation. We then discuss our conclusions and implications of our findings for academics, practitioners, regulators, and professional agencies.

**Survey Design and Sample**

The survey project is a collaborative effort with CFA France and other European CFA institute societies and professional organizations including Société Française des Analystes Financiers (SFAF), Société Française des Evaluateurs (SFEV) and ESCP Europe alumni. These associations view the implementation of valuation methods as a major concern for their members that merits

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3 For surveys on the effect of the 2007-2008 financial crisis, see Campello and al. (2010) and Bancel and Mittoo (2011b)
an in-depth investigation. We developed a draft survey questionnaire based on a review of the literature and circulated it to several academics and practitioners for their feedback. We revised the questionnaire based on their feedback and suggestions. The final version of the questionnaire was structured around five major topics: (1) Valuation models (2) Cost of capital (3) The DCF approach, (4) Relative/comparable approach, and (5) Advantages and limitations of valuation methods. In addition, we also ask respondents whether and how the 2007-2008 financial crisis affected their valuation practices and their market risk premium estimates.

The final questionnaire contained over 50 questions with several sub-questions, was three pages long, and took between 20 to 30 minutes to complete. To facilitate honest responses, we explained to respondents that the survey was anonymous and the survey information was strictly confidential. We also offered the respondents a copy of the survey results to compare their own practices relative to their peers. The survey questionnaire was made available to the participants on the internet website developed by the ESCP Europe IT services and is available at the following address: http://lime.i-campus.fr/index.php?sid=39938&lang=en

The survey was conducted from April 15 to May 15, 2012. Each professional association directly contacted their members though e-mails invitations. A total of 7281 valuation experts were contacted. We received 424 completed surveys, with a response rate of about 5% that compares favorably with previous cross-country survey response rates.

We presented our preliminary survey results at several meetings organized by the associations who collaborated in the survey. These meetings took place between June 2012 and March 2013 in France, Switzerland and Germany. We used these meetings to check robustness of our main findings as well as to collect additional comments on survey questions that are incorporated in the current article.
In this article, we conduct a detailed analysis of 356 responses that answered most survey questions and limit our study to eight countries that had at least 10 responses. The largest percentage of responses is from France (36%), followed by the U.K. (16%), Spain (13%) and Switzerland (12%). The remaining countries, Poland, Belgium, Germany and Portugal, account for 13% of responses. The respondents have different professional experiences. Portfolio managers represent the largest group (23%), followed by Financial Analysts (22%), Investment bankers (19%) and Valuation experts (16%). The respondents are well-educated; over half of them have a Master degree (53%) and about 7% of them even have a Ph.D degree. The majority (80%) of respondents have over five years of work experience in the financial industry; about 50% have spent a minimum 10 years in the industry.

Survey Evidence

In this section, we first present our findings about practitioners’ preferences for valuation models and then discuss how they estimate inputs in these models.

Which Valuation Models are Popular with Valuation experts?

The valuation models taught in finance textbooks can be divided broadly in two major groups. The first group consists of the Discounted Cash Flow (DCF) method and its variants. The DCF is built on a simple principle—the value of a financial asset is equal to the present value of all future cash flows accruing to the asset. The principle is intuitive, elegant and requires only two inputs for valuation: (1) the estimation of all future cash flow, and (2) a discount rate appropriate for the riskiness of the cash flows. Two popular variants of the DCF are: Free Cash Flow to the Firm (FCFF), and Free Cash Flow to the Equity (FCFE). The FCFF focuses on free cash flows to the whole firm and discounts these at the firm’s Weighted Average Cost of Capital (WACC). The DCF (henceforth, also FCFF) is the basic tool in evaluating firm’s investment
projects and capital budgeting decisions. The FCFE method estimates free cash flows to the equity holders which are discounted by the cost of equity and adds current market value of debt to derive firm value. The FCFE is more popular in evaluating merger and acquisitions and in banking industry because Return on Equity (ROE) is the key valuation metric in this industry. Under the correct assumptions, both FCFF and FCFE models should provide the same answer since firm value also equals the sum of discounted cash flow to equity and bondholders.

The second is the Relative Valuation (RV) framework in which a firm’s value is computed by looking at market values of a peer group of firms that are in the same industry and share similar characteristics. Typically, the firm value is derived by applying a multiple (a financial or market ratio), such as price-to-earnings (P/E), to the peer group of firms traded on stock exchanges or inferred from recent sale transactions of companies. The RV approach implicitly assumes that markets are efficient and that trades and transactions reflect fundamental or intrinsic firm values.

There are also several less commonly used valuation methods. One is the Dividend Growth model in which firm value is estimated as the present value of all future dividends with varying assumptions about dividend growth rates in different stages of the firm’s life cycle. Another is the Net worth approach that computes a firm’s value based on its net asset value. In recent years, more sophisticated valuation models, such as option valuation framework, that takes into account the firm’s ability to expand or shrink its investments and operations have been also developed.

Figure 1 summarizes experts’ preferences for valuation models and tells us that the DCF and RV approaches are equally popular methods. About 80% of respondents say that they use both DCF and RV methods whereas less than 40% employ the FCFE method. The Net worth or the
Dividend Growth Models are used by less than 22 percent of respondents whereas the option valuation or EVA models are rarely used.

Figure 1: Survey evidence on the use of valuation methods

1.1: The popularity of different valuation methods

Figure 1.1 shows the popularity of different valuation methods. The Dividend Growth Model is used by the least number of respondents, whereas Relative Valuation is the most popular. DCF (Free Cash Flows to the Firm) and Free Cash Flow to Equity (FCFE) are also widely used.

1.2: The number of valuation methods used by experts

Figure 1.2 shows that most respondents use multiple methods for valuation. About 60% of respondents rely on two or three methods; only about 21% use a single method. The combination of DCF and RV approaches is the most popular, used by over 67% of respondents. The prominence of the DCF and RV approaches reflects their dominance in text books and CFA curriculum. We will expect that highly educated professionals will tend to use

Percentage of respondents

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more complex methods, such as option pricing models. However, we do not find significant
correlations between respondents’ experience (or educational background) and methods used,
suggesting that their choices are driven primarily by the methods their peers use.

**How Practitioners Estimate Inputs in RV and DCF Models?**

Below we discuss our survey evidence on how valuation experts estimate parameters required
in RV and DCF models.

**Relative Valuation Estimation**

The main input in RV method is a multiple that is estimated for the firm’s comparable peer
group and applied to the firm to compute its value. The academic and professional textbooks
mention several choices of multiples, such as Price-to Book Value, Firm Value/ EBITDA,
Price-to-Earnings (PE) and Firm Value/Sales. Most of the respondents employ two or three
multiples, about one-third use more than three multiples. Figure 2 shows that Firm
value/EBITDA is the most popular ratio; it is employed by 83% of multiple ratio users and 70%
of single ratio users. The PE ratio is the next popular choice, employed by 68% of respondents.
The Price-to-Book, Firm Value/EBIT, and Firm Value/Sales multiples are equally popular—
each is used by about 45% of respondents.

Trading and transaction multiples are employed by 86% and 73% of respondents; about 50%
respondents use both multiples. Since RV framework implicitly assumes that financial
markets are efficient and the comparable firms are ‘fairly’ valued, we ask respondents whether
they agree that financial markets are efficient. Surprisingly, only about two-thirds of
respondents agree with this assumption. This means that about one-third of respondents
question the validity of RV approach despite using it.
The Discounted Cash Flow Estimation

The DCF requires estimation of only two inputs: (1) future cash flows and (2) a discount rate appropriate for the riskiness of the cash flows. However, we find that there is substantial disagreement among experts about how to estimate these inputs.

The Discount Rate

Most (87%) respondents use the weighted average cost of capital (WACC) for the discount rate. However, while the financial theory suggests that a discount rate appropriate for the riskiness of different cash flow streams should be used, most (61%) ignore this advice and use a single discount rate for all expected cash flows. The disagreement further widens when we ask about how they estimate the three parameters required to estimate WACC: (1) the firm’s leverage, (2) the firm’s cost of debt, and (3) the firm’s cost of equity.

The Leverage

One would expect a consensus about the definition of leverage since most text books discuss this topic in detail and recommend using the firm’s target leverage, its current cost of capital from
different sources, and market-value weights. However only about 46% of respondents follow this recommendation; about 34% use Book value Gearing and about 31% Sector Gearing (Figure 3.1). Why book values are still popular with experts despite their limitations? It may be because the data are easily available. The comments of an expert whom we interviewed sheds some light on the prevalence of book values “book value is a proxy that is far from perfect, but that may not be more “false” than other measures”. This expert also mentioned that “Considering the book value makes sense when the return on capital engaged is not far the WACC because, in that case, the book value of the firm equals its market value."

Figure 3: Survey evidence on the cost of debt and the leverage

3.1. How do you define the firm leverage required to compute the WACC?

The Cost of Debt

Computation of the cost of debt should be straightforward since it can be estimated from the yield-to-maturity information on the outstanding straight bonds or the default spread information based on the firm’s credit ratings. Figure 3.2 confirms that the majority (67%) of respondents use the actual cost of debt taking into account the firm credit rating; 27% use the normative cost of debt for target gearing. However, Figure 3.3 shows that this apparent
consensus vanishes when we ask what debt maturity they use to estimate the cost of debt? An equal percentage (40%) of respondents choose a five- or ten-years bond maturity; a few (5%) even use short term debt for calculating the firm’s cost of debt.

3.2. Do you define the cost of debt?

![Bar chart showing percentage of respondents for different cost definitions.]

The normative cost of debt considering target gearing
The actual cost of debt (considering the firm rating)

3.3. What Debt Maturity do you use?

![Bar chart showing percentage of respondents for different debt maturities.]

Short term (up to 1 year)
Other
5 years
10 years

The Cost of Equity

Computing the cost of equity is the most difficult part of WACC estimation because it is unobservable and the theory offers little help or guidance. Although nearly 80% of our respondents employ the CAPM model to estimate cost of equity, the main question is whether they follow similar or divergent practices in estimating the three required inputs in the model: (1) risk-free rate, (2) beta, and (3) market risk premium.

As discussed below, there is strong divergence in how respondents compute these parameters, especially beta and equity market risk premium (MRP). The respondents’ comments in Box 1 in
answer to whether they use methods other than CAPM also confirm this finding. For example, some respondents use a risk free rate plus a subjective risk premium to estimate it whereas others use a range between 8% to 12% considering operational and financial risk of the firm, and some even use the same risk premium for all firms. These comments indicate the difficulties in estimating CAPM which are discussed in more detail for each of the three inputs below.

**Box 1: Comments from valuation experts about CAPM implementation**

In an open ended question, we asked valuation experts whether they use any other methods to estimate require rate of return. They cite the following approaches:

- “A Risk free plus an intuitive risk premium
- The return on equity that the shareholders require
- A range between 8% and 12% considering the operational risk and the financial risk
- 15%
- The same risk premium for all firms
- Estimation of a qualitative rate based on industry business risk and stock volatility and liquidity
- The historical Implicit Cost of Equity as charged by the market
- The risk free rate plus the estimated risk (country, industry and firm)”.

**Risk-free Rate**

The risk-free rate represents the return on a completely riskless asset and textbooks suggest using a country’s sovereign T-bill or T-bonds as a proxy for this rate. Most respondents (91%) follow this advice. There is also a strong consensus on bond maturity. Most (78%) use bonds with a 10-year maturity; only 8% use bonds with maturity greater than 10 years and 9% use a one-year T-
bond. The popularity of a 10-year bond maturity bond could be explained by its high liquidity and the proximity of its time-horizon to long-term investment horizons.

There are some differences in the use of a country’s sovereign bond to proxy risk-free rate. While about two-thirds of respondents use the country’s sovereign bond, the remaining one third employ an AAA country’s sovereign bond rate to proxy risk-free rate. This dispersion, however, is less concerning because the recent European sovereign debt crisis has raised questions about whether sovereign bond of a country that is facing an overhang of default risk can be considered risk-free. The respondents’ responses indicate that they appear to have adjusted their estimation practices to account for this risk. In their comments, some experts explained that they now include a country risk premium, if the country does not have an AAA credit rating whereas others mentioned that they consider the average of all European sovereign bonds or consider the country in which the firm’s revenues/costs are generated. Overall, our survey evidence suggests a reasonable consensus on measuring the risk-free rate.

**Figure 4: The estimation of risk free rate**

**4.1. Which sovereign bond do you use?**

![Bar chart showing the percentage of respondents using different types of sovereign bonds.](image)
4.2. Which maturity do you use for the risk free rate

**Percentage of respondents**

**Beta**

The CAPM model requires a forward-looking beta *not* the historical beta but the theory is silent on how to estimate it. Most finance textbooks suggest estimating historical stock beta as a first step and then adjust it taking into account changes in firm’s current and future operations.

The historical beta is generally estimated by running a linear regression with the stock’s excess return (stock return minus the risk-free rate) as the dependent variable and the market excess return as the independent variable. Although the procedure appears quite straightforward, in practice it requires several assumptions that can potentially lead to substantially different beta estimates. The first choice is the selection of a sample period which involves a trade-off between statistical accuracy and timeliness. A longer period provides a higher statistical confidence in the beta estimate but runs the risk of including outdated information that may not be relevant to the firm’s future risk. The second choice is whether to use daily, weekly, monthly or yearly data and each selection could produce a different beta estimate. In particular, the daily returns may introduce serious measurement errors for thinly traded stocks because of non-synchronous trading with the market index. Another important choice is about the market index. A narrow index can generate a high beta for stocks included in the index due to high correlations between returns for these stocks and the market index. Another decision confronting practitioners is
whether to use the country, regional or world market index since it will differ for domestic or multinational firms.

We find that while most respondents (81%) use historical data to estimate beta, their choices about time-period and return intervals differ widely. For example, about 48% of respondents employ monthly, 20% daily, and 19% yearly returns (Figure 5.1). Further, while over half of the respondents (53%) use between one to three years period, 37% use more than three years for estimating beta (Figure 5.2). Market index choices also vary; 48% choose a county index, 24% a European index, and 24% a world index (Figure 5.3). However, this divergence is positive since 72% of respondents state that they select a market index depending on the type of firm they are evaluating—consistent with the financial theory. For example, a world index is more appropriate for a multinational firm whereas a domestic index makes more sense for a domestic firm.\(^4\)

The most striking finding is that fewer than half of the respondents (46%) adjust their historical beta to estimate future beta—the correct input in CAPM—and recommended in most textbooks. The practices about estimating the firm’s economic (asset) beta which depends on the firm’s financial and business leverage also vary. Most textbooks suggest to first calculate an unlevered beta of the company with no financial leverage, and then relever it to account for the firm’s target capital structure. About 86% of respondents use the average unlevered betas of comparable firms as an estimate of the firm’s economic beta. Most respondents also consider taxes when deleveraging betas and about 34% also use a debt beta.

\(^4\) Stulz (1995) suggests that companies should use a global CAPM instead of local CAPM to reflect the risk of the security in the context of a global portfolio. He shows that the difference with the local CAPM is likely to overstate Nestlé’s cost of equity by about 150 basis points.
Finally, we also ask respondents whether beta is a good measure of risk. Surprisingly, only 45% of respondents agree or strongly agree with this statement; remaining respondents either disagree or strongly disagree or hold a neutral attitude (Figure 5.4). Their responses could reflect the difficulties they face in estimating beta.

**Figure 5: Survey evidence on beta estimation**

5.1. What frequency of returns do you use?

5.2. Which period do you consider for estimating Beta?

5.3. Which benchmark do you use for estimating the market portfolio?

5.4. Do you agree with the statement that Beta is a good risk measure?
The Equity Market Risk Premium (MRP)

What should be the equity market risk premium (MRP) and how to estimate it is one of the most researched questions in finance. Despite this extensive research, Welch (2000) states “there is neither a uniformly accepted precise definition nor agreement on how the equity premium should be computed and applied.”

Two common methods to compute MRP involve either deriving it from historical risk premium or inferring it from the current stock prices. Both methods require several assumptions that can make MRP estimation challenging for anyone. For example, the first method requires assumptions about the length of the sample period and whether to use geometric or arithmetic averages whereas the second approach requires assumptions about future cash-flows (e.g., dividends and earning) and their growth rates inherent in current stock prices. The differences in these assumptions could partly explain the wide range of risk premium estimates reported in surveys of companies, CFOs, and market participants. There are also wide gaps between the predicted risk premia in theoretical asset pricing models and their estimates based on historical data. While the theoretical models predict that a small risk premium between 2% to 3% is sufficient to entice the participants to equity markets based on their risk aversion, the estimates derived from historical data range between 6% to 8% depending on the time period used.
Moreover, the risk premia used by academics and textbooks are also greater than those used by practitioners which normally range between 5 to 5.5\%.\(^5\)

Our survey evidence confirms these wide variations in MRPs documented in prior research. Most respondents estimate market risk premium either from historical market data (57\%) or based on expected risk premium (43\%) but there is a wide dispersion in their estimates. For example, in 2012, about half of the respondents (47\%) estimate market risk premium “less than or equal 5\%”, about 30\% estimate it to be “greater than 5\%, less than or equal 6\%”, and about 7\% estimate it “greater than 7\%”(Figure 6.1). To examine how their MRP estimates have changed in the aftermath of the crisis, we ask them about their MRP estimates from 2006 to 2012. Figure 6.2 summarizes their responses and shows an increase in MRP after the crisis. For example, in 2006, 85\% of respondents estimate MRP lower than 5\% but this percentage declines to 51\% in 2011 (and 47\% in 2012). Similarly, the percentage of respondents who used an equity premium greater than 7\% increased from less than 5\% in 2006 to 11\% in 2011 and 13\% in 2012. This trend is consistent with the higher risk aversion due to increased uncertainty and market volatility in the aftermath of the crisis documented in several prior studies.\(^6\)

**Figure 6: Survey evidence on the estimation of the market risk premium**

**6.1: What is the current level of market risk premium you use in March 2012?**

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\(^5\) Fernandez (2013) reviews 150 corporate finance and valuation textbooks published between 1979 and 2009 and finds that their recommendations regarding the equity premium range from 3\% to 10\%, and that 51 books use different equity premium in various pages.

6.2. Compared with its current level, the market risk premium you used in different years was?

**Additional Risk factors**

The main reason for the popularity of the CAPM is that it identifies a single source of systematic risk, namely the market wide risk. However, this simplicity can be deceptive because other sources of risk could also matter and may be priced, such as bankruptcy risk, liquidity risk or currency risk. Whether beta is an adequate measure of risk has been the subject of intense academic debate in the 1990s and there is general consensus that additional risk factors should be included to proxy equity market risk. While many alternative models have been proposed the Fama and French (1992) three-factor model that includes beta, size and value risk factors has
emerged as a serious contender to CAPM.\textsuperscript{7} Liquidity risk is also now widely accepted as an important source of systematic risk in the wake of the recent financial crisis.\textsuperscript{8} Moreover, CAPM does not capture currency and political risks faced by firms operating in international markets.

To examine whether practitioners have adapted their practices in view of the above debate, we ask them whether they make any adjustments to CAPM and if so, what additional risk factors they consider. The results show that a majority of respondents (66\%) include firm size and/or liquidity risk as additional risk factors but most of them make a subjective judgment to estimate risk premium on these factors. Over half of the respondents (57\%) also consider country (political) risk premium. We also ask respondents whether multinational firms have different cost of equity compared to domestic firms. Their answers reflect disagreements about this issue; while over half of them (56\%) assume a lower cost of capital for multinational firms, 37\% assume the same cost for domestic and multinational firms.

Overall, our evidence suggests that most experts are aware of the academic research on additional risk factors and try to incorporate some of these risks in their estimation but primarily based on their subjective judgments. Their preference for subjective estimates could reflect the challenges in estimating beta and market risk premium encountered by them, and confirms a wide gap in the theory and practice of valuation.

\textbf{The DCF Model: Estimating cash flows}

\textsuperscript{7} See Fama and French (1992) and Estrada (2011).
\textsuperscript{8} See Amihud and Mendelson (2008).
The second parameter in the DCF is the estimation of future cash flows which is normally done in two stages. In the first stage, future free cash flows (FCFF) are estimated for a specified time period, generally five or ten years, based on the firm business plan and discounted at an appropriate rate to calculate their NPVs. The most important task confronting experts in the first stage analysis is validating the firm’s future business plan. The validation is normally done by constructing a base case future scenario and then undertaking sensitivity and simulation analyses using firm and industry data. The second stage involves the estimation of the Terminal Value (TV), the net present value of all future cash flows that accrue after the first stage. The most important ingredient in the TV estimation is the assumption about the firm’s future growth rate because minor changes in this rate can have a major effect on the TV, and hence, on the firm value.\footnote{For estimation problems in DCF, see Penman (2011) and Friedl and Schwetzler (2011).}

Figure 7 presents our survey results on the estimation of cash flows. Over 80% of respondents conduct sensitivity and simulation analyses for their base case business plan and employ several methods to conduct such analyses. Figure 7.1 shows that more than half (53%) examine coherence with sector/industry, nearly half (49%) with the firm’s past performance, and about one-third (33%) also study the internal coherence of the plan. In contrast, there is wide variation how experts compute terminal value. Over half of respondents (51%) rely on a normative terminal cash flow growing until infinity, 27% use a multiple, and 18% assume a decreasing terminal cash flow (Figure 7.2). Because TV involves estimation of growth rates in distant future and a small error in growth rate could have a large effect on firm value, we also ask respondents whether TV should be limited to a maximum percentage of firm value. Most respondents (63%) do not support imposing any maximum limits on TV percentage.
Figure 7: Survey evidence on the DCF implementation

7.1. Which do you use to examine sensitivity/robustness of a firm's business plan?

![Bar chart showing percentage of respondents for different methods of examining sensitivity/robustness.]

**Percentage of respondents**

7.2. When computing terminal value in the DCF, which approaches do you use?

![Bar chart showing percentage of respondents for different methods of computing terminal value.]

**Percentage of respondents**

The Bottom Line: How Useful are Valuation Models?

We ask respondents whether current valuation models are useful and provide good estimation of firm value. Surprisingly, despite the estimation challenges, over half of them (58%) “agree or strongly agree” about their usefulness and about one third (30%) have “Neutral” views. Figure 8 presents their answers on the major limitations and advantages of the valuation
models. The experts highlight three main advantages: “Provide comparison with other firms” (44%), “Standardization” (43%), and “Easy to implement” (36%). The respondents cite main limitations as “Difficult to estimate discount rate” (41%), “Difficult to estimate terminal value” (39%), “Difficult to check business plan” (29%), and “Difficult to define a peer group when using comparable” (27%). Additional comments (provided in the box) also suggest that while the valuation models are simple to understand, estimated valuations could be very sensitive to small changes in parameter values.

**Figure 8: Advantages and limitations of valuation models**

**8.1: What are the major advantages of current valuation models?**

![Advantages graph](chart)

**Percentage of respondents**

**8.2 What are the major limitations of current valuation models?**

![Limitations graph](chart)
Percentage of respondents

Box 2 : Comments from valuation experts about the advantages and limitations of valuation models

In an opened question, some of our respondents make comments that highlight the advantages and limitations of valuation models:

Advantages:

- Valuation models are easy to be understood by top executives and other market participants
- Valuation models fit with microeconomic theory
- Valuation models are historically “traceable”

Limitations:

- Details in DCF give an illusion of accuracy whereas those models can be extremely sensitive thus not accurate at all.
- At the end, buyers estimate that the value of a firm is defined at a specific moment in a specific market situation. It will be a different value regarding different macro-economic elements

The Impact of the recent Financial Crisis on Valuation Practices

The recent financial crisis was one of the most severe since the Great Depression and has challenged academics to re-examine their asset pricing and valuation models. We ask respondents whether they have changed their valuation practices in the wake of the crisis. Over
half of the respondents (55%) reported no significant changes in their valuation practices as a result of the crisis. Of the remaining 45% who did implement several changes, about one third (30%) revised their discount rate, about one fourth (24%) reassessed the cost of debt from different sources, about one fifth (21%) modified the country risk assessment, and about 14% changed the firm’s liquidity assessment. Additional comments of the respondents (Box 3) also convey that liquidity, access to financing and the selection of the peer group have become more important in the aftermath of the crisis.

**Box 3 : Comments from valuation experts about the impact of the crisis on the valuation impact**

In an opened questions, some of our valuation experts indicate that they:

- now exclude from the comparable sample firms that might be affected by the country economic situation (such as default)
- consider that liquidity and credit criteria are now more important
- make more due diligence in the choice of peer groups
- are more risk adverse
- consider that the positive impact of the gearing on the WACC is no more really relevant
- give more importance to cash, liquidity, access to financing, refinancing ability, ability to sell assets and at what prices
- value the ability to tap different sources of finance: straight debt, convertibles, secured and asset-backed debt, joint ventures
4. Conclusions

Over the last 50 years, the financial theory has developed a simple and elegant valuation framework that requires the estimation of only a few parameters. However, the implementation of this framework is challenging because the theory provides little guidance about how to estimate these parameters. Consequently, practitioners are forced to make their own assumptions that could introduce serious errors and differences in parameter estimates. A relevant question is how serious are these errors and disparities in estimates?

We find that while most experts use both Discounted Cash Flow (DCF) and Relative Valuation (RV) models, their assumptions and estimation methods for almost all key inputs in these models vary widely. While most of the disparities we identify can be attributed to a lack of clear guidelines about estimation, we also document instances where practitioners ignore the recommendations provided by the theory. For example, while the theory calls for forward-looking betas and risk premiums, less than half of practitioners make such adjustments. Despite these estimation problems, the good news is that most practitioners find valuation models useful primarily because of standardization and comparison with peers. The bad news is that two experts could arrive at widely different estimates despite using the same model, indicating a wide gap between the theoretical valuation framework and its implementation.

Our findings suggest that the process of estimating valuation parameters is as important as the valuation itself and needs serious attention of both academics and practitioners. The valuation of a financial asset is an art not science because it involves projections about future cash flows and risk that require subjective judgements in a particular context and time period. From this perspective, current valuation models provide sufficient flexibility to choose assumptions that are in line with the firm value at a particular time under prevailing market conditions and sentiment.
However, huge differences in estimation practices for almost all parameters as noted in our survey becomes an important issue because these errors can multiply. For example, a 1% difference in the firm’s cost of capital and in its cash flow growth rate assumptions can not only have a strong effect on firm value but also on its financing and investment decisions. We hope that our results will spur a much needed debate among academics and practitioners about standardizing estimation practices for at least some key parameters, such as equity risk premium and terminal value. More emphasis on assumptions and estimation methods in Finance textbooks will also help in shrinking these valuation disparities. Our findings are also relevant to professionals in accounting, banking, credit rating agencies as well as to regulators and policy makers because “fair value” estimation is at heart of the post-crisis regulations. We recommend that key valuation parameter estimates should be disclosed in financial and valuation reports. Meanwhile, our survey will help practitioners in learning about the practices of their peers in dealing with these estimation challenges.

References


