

# EQUITY VALUATION FOR ANALYSTS & INVESTORS

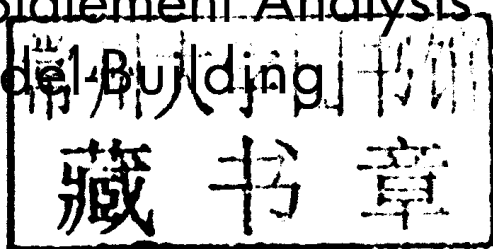
A Unique Stock Valuation Tool  
for Financial Statement Analysis  
and Model-Building

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A Unique Stock Valuation Tool  
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# ACKNOWLEDGMENTS

I have spent most of my financial career and all of my analysis career at Argus Research, an independent equity research firm founded by Harold Dorsey in 1934. My nearly 20 years at Argus have been marked by unprecedented tumult in the financial world, which the firm has navigated steadily and professionally. I am indebted to Argus and the Dorsey family for creating a culture that invites and rewards independence, self-motivation, and innovation while maintaining consistently high standards in investment analysis and portfolio management.

Argus CEO and president John Eade hired me at Argus nearly two decades ago. His support for my succeeding him as Director of Research strengthened my confidence in my ability to write this book. Richard Cuneo, Director of Operations at Argus, is another mainstay at the company and in my professional development. Sharon Dorsey Wagoner and Fern Dorsey serve ably as heads of Argus Investors' Counsel and Vickers Stock Research, respectively.

The composer, musician, and private wealth manager Dana Richardson worked as an analyst at Argus earlier in the decade. Discussions with Dana were the seedbed for the set of concepts that evolved into Peer Derived Value. I am indebted to Wendy Abramowitz, skilled analyst and top stock-timer, for introducing me to comparable historical analysis as well as key themes in technology-sector analysis. Jim Solloway, CFA, former Chief Economist and Director of

Research at Argus, taught me the fundamentals of OLS regressions for smoothing long-term growth rates. Bob Becker, CFA, was my partner in innumerable projects at Argus, and his counsel was always excellent—particularly his guidance on passing the CFA (“take the practice tests ‘till you’re climbing the walls”).

Other analysts whose work directly or indirectly influenced the body of knowledge underpinning this work include Chris Graja, Joe Bonner, Kevin Calabrese, Suzanne Betts, Bill Selesky, Erin Smith, David Toungh, Martha Frietag, David Kerans, Phil Weiss, John Staszak, David Ritter, and Gary Hovis, dean of the electric utility analyst community. Kevin Tynan is the only automotive analyst in captivity who can break down a carmaker’s pension obligations while simultaneously rebuilding a carburetor; he has been my chief guide in decoding the mysteries of Excel.

The person identified with the quote that opens the book is Betty “B.J.” Edwards, long-time Chief Editor at Merrill Lynch. Seemingly with a few pencil strokes, she helped transform my compositional skills from a scattering of concepts to a well-ordered file cabinet of handy rules and strategies. Though we’ve never met, I am indebted to Frederick Crews, author of *The Random House Handbook*, who showed that a light touch, far from degrading the seriousness of a work, helps make valuable lessons indelible (“... who but that orderly’s mother...” indeed).

Sophie Efthimiadou was the McGraw-Hill editor who, on the strength of a recommendation and my pleas over a cup of coffee, became my early champion. She helped me tighten and hone my proposal until it became the book I’d spent 20 years preparing to write. Jennifer Ashkenazy, CPA, gave the accountant’s thumbs-up to the project. Morgan Ertel was indispensable in suggesting the restructuring of the book into its four-part structure and advancing the project from rough manuscript to finished product. Daina Penikas guided me through the copyediting and proofreading process with great good humor.

At my nephew James’ wedding in August 2008, I ran into my cousin Trish Pignataro, CPA, who immediately started giving me the needle: “When are we going to see that book?” and “I always thought you were going to write a book.” At a time when I was mulling just such a project, this goad proved to be a tipping-point event. On her behalf, I wrote a book that only an accountant could love.

My wife Marie has nudged me out of one rut after another over the years and is largely responsible for my semi-respectable state. While I was writing at all odd hours, the kids managed to keep the mayhem at sub-Bedlam levels. The year this book was written, 2009, was without doubt the busiest of my corporate life. Despite all the time stolen from family by book and work, no one complained and everyone was supportive.

My delusions of mathematical grandeur notwithstanding, I might burn out the batteries on my calculator trying to figure out what I owe Rich Yamarone, Bloomberg economist and author of the invaluable *The Traders' Guide to Key Economic Indicators*. Most directly, he introduced me to his editor, with a kind word and a recommendation, and brought to bear his considerable reputation in the financial publishing world on my behalf. Without his nod, there would likely have been no book. Less directly and more importantly, he demonstrated that the guy in the next office could have the audacity and tenacity to conceive, design, write, and publish a highly useful text for the financial services industry. I am eternally indebted to Rich, unless he actually asks me for money.

# INTRODUCTION

“There are many ways to skin a cat.” So spoke a senior editor at Merrill Lynch, explaining her unerring ability to wring clarity and concision from the varied but consistently gnarled prose styles of the equity analysts. Bad writing in all its iterations—stuffy, unREFERRED, thin, florid, lacking in segue or sequence—never boxed her into a corner; she knew multiple ways out.

Despite the shortcomings in their writing styles, the analysts with which we worked too seemed to skin cats—or analyze stocks—in a lot of different ways. However varied their approaches, they always sought to derive the same thing: the dollar value of the asset. Editing and analysis, I was learning, traveled many paths to a single outcome.

Having barely digested this wisdom, I left for Dallas where I wrote and typeset an automotive trade journal. Back in New York in the early 1990s, I returned to financial editing while being charged with a fair amount of writing. Surmising that editing would never pay New York City rents, I became a financial analyst early in the decade. Eventually I entered the CFA (Chartered Financial Analyst) program and had my financial analyst charter in hand by 1999.

As a former English major, I was *tabula rasa* for the business world and had no bad habits to unlearn. And armed with the excellent knowledge garnered in the three-year CFA program, I felt prepared for the measured and precise long-term valuation of assets.

The first thing I learned, however, was that those assets wouldn't stand still, which—as far as investors were concerned—meant that long-term valuation be damned. The movement in equities I observed rarely correlated to longer-term trends within their peer groups or even within their own financial histories. Instead, stocks appeared to be dancing to their own tune, and they took a step this way or that each time a new product was introduced (or flopped), the competitive landscape underwent secular or cyclical changes, regional market surged or retreated, and so on.

The longer-term movements in stocks tended to supersede these daily gyrations. Yet some companies meaningfully diverged from trends when their competitive position cumulatively changed, or their asset portfolio was overhauled, or new entrants ate their lunch. Analysis, I was learning, involved blending cyclical, secular, and company-structural events into the mix without spoiling the soup. Within the market noise, I was eventually able to discern the signal: consistent profits. Just as reliable earnings differentiated the successful companies from the pretenders, reliably modeled income flows and cash streams informing the valuation process became the best guide as to whether a company was successfully navigating industry transitions or succumbing to competitive pressures.

In an earlier, seemingly more staid time, swaths of companies devoted to a single industry—paper, say, or railroading—could be valued from the top down, with a focus on return on equity (ROE) and reasonably consistent variations from growth in gross national product (GNP). But as competition grew more intense and global, as companies—even those competing around a single commodity—increasingly pursued their own paths to profits, conclusions derived from top-down analysis veered further and further from market reality. As top-down analysis fell from favor, bottom-up analysis not only proliferated, it produced its own mantra: go granular. It was no longer enough to produce rounded earnings per share (EPS) estimates based on general and long-term trends. EPS forecasts and other inputs, such as cash flow, needed to reflect the myriad forces and fast-flowing information driving line items on a segment-by-segment and even subsegment basis.

## **Finding and Refining the Approach**

How to derive those income flows and cash streams? As I immersed myself in analysis and got to know my colleagues, I realized there was no single template for calculating income and cash flow. Nor was there a single reliable method for



valuing equities. This went well beyond inherent differences from industry to industry; within single industries and even within narrow niches, income modeling and asset valuation approaches varied widely. Everyone seemed to be doing it their own way. Some analysts had inherited models or relied on the advice of mentors. Other analysts, dissatisfied with inherited wisdom, were fashioning their own models, particularly for companies and industries that were previously nonexistent but now seemed to be at the center of the market's obsession.

Almost without realizing I was doing so, I felt my way toward a sustainable analysis model. Skittering at the edge of consciousness were a few constants. In the market there are no rights and wrongs, no light under the bushel basket; the market is driven by perceptions and realities, and a comprehensive valuation scheme must accommodate both. If earnings and cash flow drive the valuation process, they must be precisely modeled and then seamlessly integrated into valuation analysis. The valuation model must accommodate both minute-to-minute developments and long-term trends. And no pertinent data point could be orphaned, marginalized, or left behind.

As this overriding objective began to coalesce, I realized the scheme was easier envisioned than executed. The variety of tools for modeling and valuation, though individually useful, are in their abundance the analysts' greatest challenge. Certainly, the industry tool kit was plentiful. From the CFA process, related courses, mentors, and colleagues, I learned financial statement modeling, comparable historical valuation, discounted free cash flow valuation, industry analysis, and a host of other neat tricks. What I needed, though, was a way to organize all these inputs into a single stream that all contributed to the final output.

How to rank and prioritize among them? For the modeling of income and cash flows, there was no single template; ditto for the determination and application of growth rates. Historical comparables analysis captured the past valuation experience with precision but carried within itself the warning that it could not look too far ahead.

The various present value schemes, such as the dividend discount model and discounted free cash flow (DFCF) valuation, were ingeniously constructed to capture the long-term value of the asset. But what about the here and now? If DFCF signaled that a reliable growth rate for the company was 6 percent, but then that company indicated a glitch in its production—a fire at a motors plant in Jakarta, say—what next? Shave the growth rate to 5.875 percent? And for how long?

Valuation within the peer group presented even bigger challenges. Seemingly nothing could be more vital or telling than peer valuation, yet it had a surprisingly touchy-feely aspect. What's more, peer evaluation's implicit message

(e.g., “This stock used to trade at a premium, it is now at a discount, so do something”) really carried no guidance on how to proceed.

As time passed, knowledge accrued. When one is seeking to prioritize among schemes, when one is looking to assign each value its own gradient on the valuation curve, nothing substitutes for experience. More specifically, there is no better way to learn the art of valuation than enduring the humbling experience of forecasting great things for a stock only to see it sink (or watching the overlooked asset soar out of sight). You begin to calibrate, a term defined as adjustments based on recent experience but that in practice entails using past failures to steer you closer to the vital truth. Gradually ego subsides; you stop fighting the market and begin to work with it. You fit your scheme to encompass all of the market’s information.

The analyst’s challenge then begins to compound into a linked series of procedures. We commence by estimating income and cash flows reliably. We cast these estimated values into the web of historical inputs and value relationships. We incorporate industry data where appropriate. And we weave this information consistently into the valuation process without leaving any loose ends. As much as possible, we seek to systemize the market’s valuation processes and then rank and weight them. Even while establishing and enacting this dry and clinical process, the analyst must incorporate the market’s chaos and dynamism, wherein hunches and rumors can sometimes supersede rigorous valuation process. As various goals and themes intermingle, the challenge becomes the practical and consistent application and interaction of the various information inputs needed to arrive at a value forecast.

The developing analyst is immersed in and eventually becomes conversant in the various theoretical approaches to asset valuation. In the end, the analyst serves masters—research directors, portfolio managers, and ultimately the end user or asset owner—far removed from financial academia. The phone rings; steps are skipped; compromises are made. The analyst simply needs to value that asset; few are interested in his or her process. Our task is not to argue financial theory but to deploy it. So, we won’t, for example, defend or seek to upend such widely accepted industry verities as capital asset pricing model (CAPM); we won’t even explain it much. We’re going to take it as a given and simply put it to work.

Gradually, you arrive at the realization that estimating the dollar value of the asset is not so much valuation theory application as it is valuation choreography. The model needs to be supple and responsive enough that, if an input changes, an entire chorus line of data points kicks in time. In a real-world example, if an analyst changes an assumption about current-quarter pricing for

second-generation mobile handsets at Motorola, the information needs to ripple across the current and next-year income statement, up through comparable and discounted free cash flow valuations, and into the calculated dollar-based fair value.

## An Overview of Equity Valuation for Analysts and Investors

On the one hand we've acknowledged that the analyst can follow many paths to deriving dollar value of the asset; on the other, we've constructed a fairly specific approach to building the model. Now, how do we reconcile the two? We won't take a "my way or the highway" approach; but working within our system provides a functioning and (double emphasis) beginning framework for financial statement modeling and valuation analysis. Our goal is to provide a basket of unified concepts so the self-directed analyst can construct his or her own model. We'll show you *exactly* how we do it while leaving room for variation as the maturing analyst spreads his or her wings.

Learning and teaching, while sharing some points in common, are very different processes. If our goal is to have you learn how to apply modeling and valuation technique, we'll need to teach you specifically how to apply this in the format of an excel workbook. In writing this book, I was struck with the challenge facing any instructor standing before a group of students, each with varying degrees of intelligence, experience, and willingness to learn.

Like that instructor, we'll begin with a lot of hand-holding and the assumption that even the most rudimentary formula and application must be thoroughly explained. As such, the information and instructions that are offered in this book will be accompanied by a level of exacting detail. Most of these exhaustive explanations can be found in the very first section of this book, which details how to build the modeled P&L. As we proceed, we'll assume everyone is learning at the same rate, and this almost paint-by-number level of detail will recede. We will further assume the modeler has developed some familiarity with the workbook and worksheet, and our instructions, while never cursory, will become less detailed. As the book moves along, we'll gradually reduce the accompanying detail around every Excel formula.

The book is concerned with two main themes: modeling and valuing. It is structured in four parts: financial statement modeling; comparable historical valuation; discounted free cash flow valuation; and relational valuation. Each of the four parts begins with an opening essay, followed by multiple chapters. The biggest section, financial statement modeling, has seven chapters; the three other

parts have three chapters each. The text is book-ended by this introductory chapter as well as a concluding chapter.

As in any interconnected whole, concepts in any one chapter might arguably be better suited for inclusion in another; but that would risk ripping the fabric created by other relationships. In every chapter we begin with a discussion of the topic, including the changing currents and fast-formulating priorities that are shaping each topic as we speak.

In a first introductory chapter, we describe the real-world challenges inherent in modeling and valuation, describe the basic structure of the book, and discuss our processes.

Financial statement modeling, and most particularly income statement modeling, is the topic of the book's first section, encompassing seven chapters. A first step in the valuation process is to build an income statement—forecast from five to eight quarters out—that can incorporate company developments, industry trends, and our best estimate of what the future will hold based on past practice and experience. Anyone in the field has encountered many of volumes on valuation. Income statement modeling gets second-class status on the premise that it's all percentage-of-revenue compilation. In fact, investors cannot reliably value the asset if the financial statement model is not nuanced and comprehensive and provides all the information possible.

In practice, what we call the income statement presentation encompasses the income statement model, but it also covers the accompanying margins, ratios, segment data, and industry detail that enable more precise modeling. One feature of this book is the recognition that the mundane and atypical can distract us from the core task of valuation. Hence, in subsequent chapters we spend some time on the exceptions—modeling foreign companies, accommodating stock splits, and so on—that can disrupt the valuation process.

We wrap up this long first section by demonstrating means of calculating smoothed growth rates and normalized earnings—tools to better assess performance across the various points in the economic cycle. A key danger in the valuation process is the inability to reliably adjust for the economic cycle. Unpredictable as it is, the economic cycle at one stage or another is continually impacting companies. The last chapter in Part 1 provides some tools to accommodate these cyclical forces.

After a rigorous discussion of the modeling process, we move onto a comprehensive discussion of common—and proprietary—tools for equity valuation. In Part 2, we discuss comparables historical valuation—that is, the use of historical price-relationship data and modeled inputs to derive asset value. The historical comparables chapters also include various useful ratios, some of which figure

directly in individual asset value decision, some of which inform the industry valuation framework, and some of which subjectively influence the valuation decision.

Part 3 is devoted to our take on present value modeling, specifically the “discount to the firm” flavor of discounted free cash flow valuation. We examine the risks inherent in this method, specifically DFCF’s implicit reliance on return on equity at a time when accounting regulations and corner-office practice are degrading the very validity of stockholders’ equity. We also use this format to first discuss incorporating various inputs into determining value of the assets on a risk-adjusted basis.

In Part 4, we use the individual equity workbooks we’ve created to build and populate an industry matrix. In it we can track industry data and performance of the equity and its peer group on a simple average and weighted basis and construct various alerts to capture gains or limit losses. The industry matrix also provides a fulcrum for beginning analysis of the asset within its industry group, along with techniques for market-weighting returns.

Concluding Part 4 of the book, we address what we deem to be an industry shortfall by explaining our method for peer-group relative value, called Peer Derived Value.

In the conclusion we briefly discuss the role of modeling and valuation analysis within the analyst’s role.

## How to Best Use This Book

How good is a newborn model? About as useful in the workspace as a newly minted college graduate—which is to say that it is more likely to knock over the coffee on your desk than it is to increase sales. College may not bestow a lot of practical information to young people, but it does teach them how to learn how to learn (at least we *hope* it does). Similarly, our wet-behind-the-ears model is well-intentioned but awkward, not to mention alarmingly deficient on day one in real-world common sense. But it is structured to accommodate ever more information. A few months into the job, our recent college graduate may surprise us with fresh insights and new energy brought to a familiar task. Similarly, our model is designed to incorporate new inputs in the formulation of investment opinion and determination of investment value.

The new model must be structured to gather more data, so along the way we’ll elaborate steps to enable an ever-more-granular approach. It also must calibrate and, finally, replicate. By that I do not mean that the new model just needs

to be able to spawn like models for like (or even unlike) companies. It also must be able to add a new measurement and valuation period (typically one year, divided into quarters) without needless repetition of steps. It must be able to reflect changes in company data presentation, something that happens a lot more often than you'd think. Remember, our model lives in a world of ringing phones, urgent e-mails, tense morning squawk sessions—no ivory tower, all business.

One of the biggest challenges for analysts working in the real world is balancing the rigorous application of theory and process with shortcuts. When modeling a balance sheet, the analyst can model each account in accord with the line items in the cash flow statement—or he or she can increase all balance sheet accounts uniformly at forecast gross domestic product or the asset's historical growth rate. Whenever possible, we describe the more rigorous process as well as the shortcut. Again, our goal is not to bog you down in process or theory but to help you build the model. Sometimes, the choice of formal process versus the shortcut is related to your position in the value chain. The buy-side analyst charged with keeping an eye on entire industries and sectors may make different choices and compromises than a sell-side analyst charged with monitoring a tidy group of 12 or fewer stocks.

Modelers need to respond to new real-time information inputs; the model is built to accommodate company information as it is issued. For instance, a company typically may report its results 20 days after quarter end and use a somewhat amended or modified income statement. Sometime later, within a 45-day window, it will issue its formal quarterly financial results within the 10-Q format, and this income statement may be more detailed and nuanced. But if you wait for this later input, you'll be lagging a market that has already digested and moved on from the real-time information issued on day 20.

Once you've completed a full company modeling, don't admire it too much: the company has a fair chance of changing its reporting style. This may reflect maturation of a one-time growth company, appointment of a new chief financial officer's competitive concerns, or a response to changes mandated by the U.S. Securities and Exchange Commission. As much as possible, we build the overall valuation model to seamlessly accommodate such changes, which typically occur within the Income Statement Presentation. In these situations, our approach is to keep a copy of the old model so informational content is not lost while moving forward with the new model.

A lot of times in this book I'll tell you what to do with a fair amount of exactitude. I apologize in advance for the knee-jerk imperative. It's not that I assume my approach is superior to the many other paths to the dollar value of the asset. Given the organic nature of the process I've built, it works well in its totality but is

unreliable in its bits and pieces. And I can't put *please* or *kindly* before every command; all that wheedling would eventually get on your nerves too.

This book sets out to accomplish much, and to get it all done, we need to stay on task. The operative metaphor I'll sometimes use in this process is the cattle drive. Yes, I'll pause to spin some stories along the way. I could argue the merits of every financial theory we encounter until the campfire goes out. But the imperative is to push those cattle a little farther down the trail every day.

Sticking with the western theme, old analysts can come to resemble old cowboys left too long in the sun: similarly grizzled and at risk for turning crusty, curmudgeonly, and cynical (and we're not even out of the C's). Despite the inevitable crankiness that sets in with too much time in the Wall Street sun, I'll try to keep my rants to a minimum and mainly stay on topic.

Within every financial writer lives the soul of a frustrated novelist. Long before learning the basics of finance, such writers learn the basics of three-act drama and story arc: the setup, the "backstory," the denouement, and so on. Central to delivering an effective and satisfying conclusion at story's end is the resolution of those themes identified within the dramatic exposition. These backstory elements can turn the early going into a tough slog, but they can equally make the climactic wrap-up all the more compelling and satisfying.

In this book, the income statement serves as a species of dramatic exposition, and valuation technique as the story arc. I'll begin to weave all the strands in the discussion of "Industry Matrix." And with "Peer Derived Value," we reach a climax as all the elements of our prior work coalesce to enable a new and proprietary valuation technique. I offer final thoughts on "Dollar Value of the Asset" as a postscript. If you keep that in mind, the detailed slog through the income statement with which I begin the book may not seem so arduous.

## The Uses of Modeling

If you've already plunked down money for this book, it's a bit late to ask this question, but I'll ask it anyway: why model? It may seem like needless trouble in an era in which historical and forecast data is widely available. I'd suggest that if you haven't run this data through your fingers, it can be more misleading and dangerous than no data at all.

I've tried to create a concise and sufficiently compact model that with time you'll be able to build and populate in little more than a day. While even that may seem like too much of a commitment in your busy life, the asset manager often finds that key names—Kimberly-Clark, or IBM, or Emerson—will be bought

and sold numerous times in the course of your investing life. Doing the modeling process yourself rather than relying on outside sources makes you better able to wring value from what you read in the 10-K or 10-Q. Throughout this book, I'll draw on my extensive modeling experience in the communications technology space while straying now and again into semiconductors, manufacturing, and other industries. I always try to use illustrations with bearing across the entire universe of investable equities (banks excluded; their income statement presentations warrant their own book).

Modeling will fine-tune your BS detector. Time and again you will hear CFOs and CEOs promise millions of dollars in savings from this or that restructuring initiative. With the market's short memory, management is rarely held accountable for failure to deliver on these promises. Investors are too busy chasing the next carrot of operating cost reduction down the road to notice when they are whacked with the stick of earnings shortfall. But the careful modeler will have the quarterly operating cost totals before his or her eyes; and they're visceral, because he or she has typed them in.

The financial models referenced in this book were built over years and in some cases decades. The mature models tend to be hundreds of columns wide and hundreds of rows deep. Presenting these models "as is" is simply impractical on the page. The book includes upward of 65 figures or examples that represent snapshots or snippets in each case of a living model. In constructing the examples, I faced a choice: freeze the snippets to include the original column and row references; or use the column and row references created in the scaled-down snippets. Had I used the first choice, an income statement example might have referenced cells within columns BF through BJ, and rows 167 through 174. I felt this would be needlessly confusing. Accordingly, throughout the text I use column and row references created within the snippets. Because putting column and row headers on the snippets would give a false impression of the size and scale of the actual models, I have eliminated column and row headers from the figures. As much as possible I have indicated truncation within the models by the use of dark shading. Light shading is used to highlight rows, columns, or cells of interest.

Finally, a word on nomenclature, or specifically the pronouns, that are employed throughout this book. As you may have noticed, I'll variously use *I* or *we*. This is not as random as it may at first appear. The word *I* refers to the author, Jim Kelleher, and generally relates to my anecdotal experiences in some area. The word *we* refers to the legions of analysts, investors, students, and others who have directly and indirectly contributed to this process; to them I am eternally grateful.



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