

Time to Change Your Investment Model

Feng Gu and Baruch Lev

Feng Gu is professor of accounting at the School of Management, State University of New York at Buffalo. Baruch Lev is professor of accounting and finance at the Stern School of Business, New York University.

We demonstrate empirically that the gains from predicting corporate earnings, or consensus hits and misses—an activity at the core of most investment methodologies—have been shrinking fast over the past 30 years. We identify the main reasons for this loss of earnings relevance and propose an improved alternative to current investment methodologies, one that focuses on the “strategic assets” of the enterprise and their contribution to maintaining the company’s competitive edge. We demonstrate this investment methodology using subscription-based companies.

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Imagine that you were offered a perfect earnings prediction model that enabled you to predict *accurately* whether any company would miss, meet, or beat next quarter’s analyst consensus estimate. No more pleading with executives for earnings guidance, no need for your proprietary earnings model and elaborate spreadsheets to forecast company performance, and no more participating in earnings calls or attending industry conferences and investor days to obtain background information. You now possess the perfect earnings prediction machine. Of course, there is no free lunch, so you will have to pay for it. How much would you be willing to pay for the exclusive use of this investment marvel?

Why predict earnings? Because earnings have been at the core of investment (security) analysis from its inception and remain paramount when evaluating a company’s growth potential. Benjamin Graham, the father of systematic investment analysis, based his unique stock-picking methodology on the prediction of corporate earnings, from which he derived expected share prices using an average price-to-earnings ratio. Graham and his coauthors (Graham, Dodd, and Cottle 1962) devoted no fewer than 277 pages of their best-selling book, *Security Analysis*, to the accounting measurement of earnings and other financial reporting data, followed by an extensive discussion of earnings prediction and earnings-based valuation models. Fast-forward half a century to current financial (security) analysis texts, which also emphasize the importance of the prediction of earnings (or return on equity [ROE], return on assets [ROA], or residual earnings) for security valuation. For example, a widely used text (Wahlen, Baginski, and Bradshaw 2010) devotes 100 pages to profitability analysis, another 100 pages to forecasting profitability, and 37 pages to earnings-based valuation models, concluding:

Reported earnings are the single most widely followed measure of firm performance. . . . Analysts often spend enormous amounts of time and effort building forecasts of firms’ upcoming quarterly and annual earnings. . . . Therefore, it is logical that accounting earnings provide a basis for valuation. (p. 1006)

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In practice, financial analysts, both sell side and buy side, actively seek earnings guidance from company executives as inputs to their elaborate valuation models, which support their earnings estimates and stock recommendations. Undoubtedly, earnings prediction is at the core of both the theory and the practice of investment analysis.

So, how much is a perfect earnings prediction model worth to you? Surprisingly, a lot less than you might expect. Would you believe *nil*, as the evidence we present in this article shows? This intriguing finding about the underwhelming usefulness of reported earnings naturally requires an explanation, which we provide. We then offer an outline and a demonstration of our proposed alternative investment analysis, which shifts the focus from a company's earnings to its value-creating strategic assets and their deployment.

The Gains from a Perfect Prediction of Consensus Beats and Misses

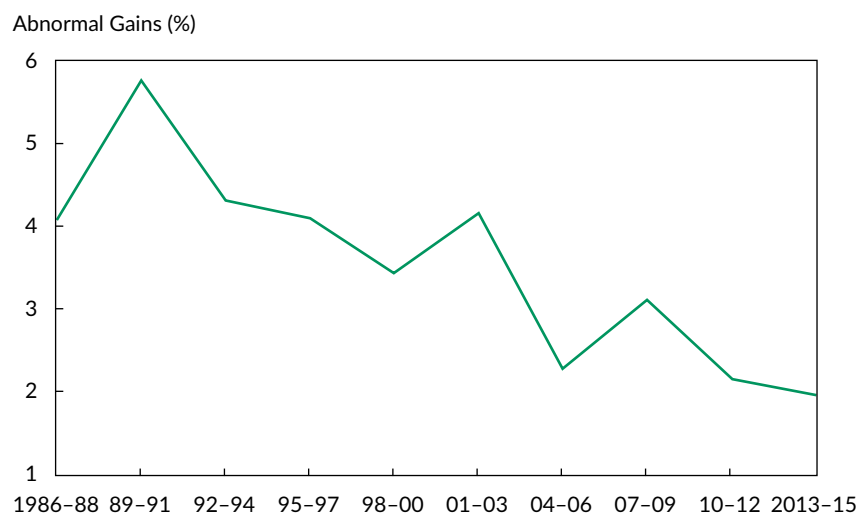
For each public company and quarter during the recent 30-year period 1986–2015, we can compute the gains from a three-month investment, starting 60 days before quarter-end and ending 30 days after quarter-end (to include the quarter's earnings release), in the companies that exactly *met* or *beat* analysts' consensus earnings estimates—as well as the gains from shorting the companies that subsequently *missed* the consensus.¹ These are, of course, the investment gains you will reap from using the perfect earnings forecaster to “pre-identify”—roughly three months before the quarterly earnings release—the companies that will meet or beat the consensus as well as those that will miss it, enabling you to invest in the former

and short the latter.² Figure 1 depicts your average gains from investing in companies that will meet or beat the consensus (the median gains portray a similar pattern). The gains are aggregated over three-year periods.

The most striking feature of Figure 1 is the sharply declining curve. The average gains from investing in the companies that will meet or beat the consensus estimate continuously dropped from 6% in 1989–1991 to 2% in 2013–2015: a 67% return decrease!³ Predicting consensus hits and beats was obviously a winning strategy in the 1990s and early 2000s, when you took security analysis courses and started your career—earning annualized *abnormal* gains of 20%–25%. Unbeknownst to many, however, earnings prediction has lost much of its relevance in recent years. The gains from shorting the stocks of companies that missed the consensus are even lower—1.6% in a recent period.⁴ We will elaborate on the reasons for earnings' fall from grace shortly.

Using Figure 1, a devil's advocate might argue that although the perfect earnings prediction gains have declined sharply over the past 30 years, the current 2% three-month return is not exactly chump change. True. But to obtain such gains, you do not need any intricate machinery to perfectly predict consensus beats and misses. A “dumb” *momentum investment*, which invests only in the 10% of stocks with the highest return over the past 12 months and shorts the lowest 10%, yields a similar return.⁵ Recall that the 1.6%–2.0% gains from predicting consensus beats and misses are derived from a *perfect prediction*. Because that is impossible, the actual gains from your elaborate spreadsheets and earnings prediction models are substantially smaller.

Figure 1. The Shrinking Gains from the Perfect Prediction of Consensus Hits and Beats



You might also counter our conclusion about “earnings’ fall from grace,” saying that it merely reflects the adverse consequences of the “earnings game”—whereby some companies “walk down” analyst forecasts only to beat them with the subsequent earnings release.⁶ No doubt some of this chicanery goes on in the market, though it is neither prevalent nor a new phenomenon. Yet Figure 1 clearly shows that until recently, meeting or beating the consensus was a winning strategy.

To cover all the bases, we can now abstract from analysts’ consensus estimates and the accompanying earnings games and instead focus on predicting *earnings growth*. We compute the projected abnormal gains from investing in the shares of companies that will subsequently report an *increase* in quarterly earnings relative to the same quarter the year before—similar to the computation of gains associated with beating analysts’ consensus. The 30-year pattern of the gains from the earnings growth investment strategy is depicted in **Figure 2**. Again, the deterioration of gains from perfect growth prediction is evident. Clearly, the problem lies with reported earnings, not in the way investors use them. Simply put, earnings no longer reliably reflect changes in corporate value and are thus an inadequate driver of investment analysis.⁷

Why Earnings’ Fall from Grace?

Corporate earnings used to reflect the outcome of business operations and the consequent creation or destruction of enterprise value. Earnings—measured as the difference between revenues and cost of sales, along with other recurring expenses (sales commissions, interest payments)—indicated the *value created* by the enterprise. Investments (e.g., in plant, equipment, transportation fleet, or retail outlets) generating future benefits were capitalized and thus

did not affect reported earnings, except for their periodic depreciation charges. Those were accounting’s “golden days,” when the income statement was a highly informative document and its bottom line—earnings—“moved markets.”

Enter the dramatic transformation in corporate investment and business models portrayed in **Figure 3**.⁸ Starting in the early 1980s, investment in traditional, tangible assets (structures, factories, machinery, inventory)—considered assets by accountants and reported accordingly on the balance sheet—dropped precipitously from 15% of gross added value in 1977 to 9% in 2014, a 40% drop. In contrast, the investment rate in intangible capital (R&D, patents, information systems, brands, media content, business processes)—mostly *expensed* in corporate income statements—increased continuously from 9% to 14% of added value, a 56% increase. This radical business model transformation came to be known as the *knowledge—or information—revolution*, an irreversible trend in developed economies, affecting practically every economic sector.

The ascent of intangible investments was driven by revolutionary technological change (information systems, the internet) and by waves of privatization, deregulation, and business globalization, which introduced and enhanced competition in practically every economic sector. The only way to survive and prosper in such a competitive environment was through constant product and process innovation, achieved primarily by investing in intangible assets (R&D, brands, IT, business processes).⁹ But while all this was happening, accounting regulators were—and still are—asleep at the wheel, treating the value-creating intangible investments as regular expenses.

Hard to believe, but all the heavy corporate investments in internally generated intangibles (\$350

Figure 2. The Shrinking Gains from the Perfect Prediction of Earnings Growth

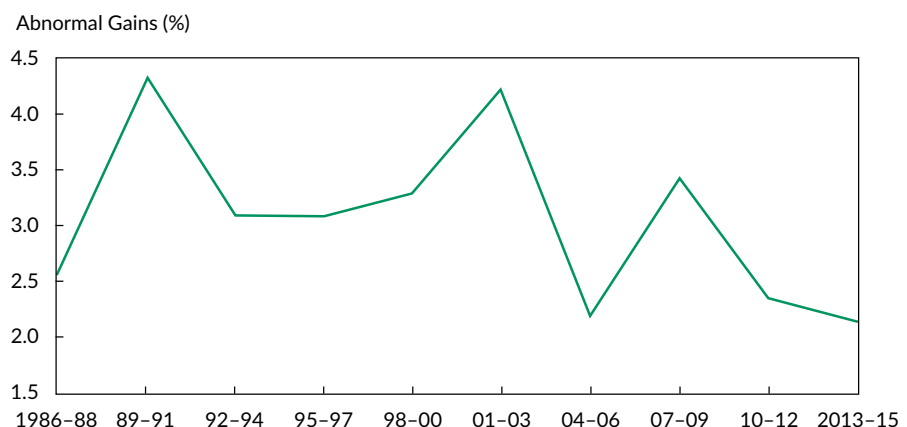
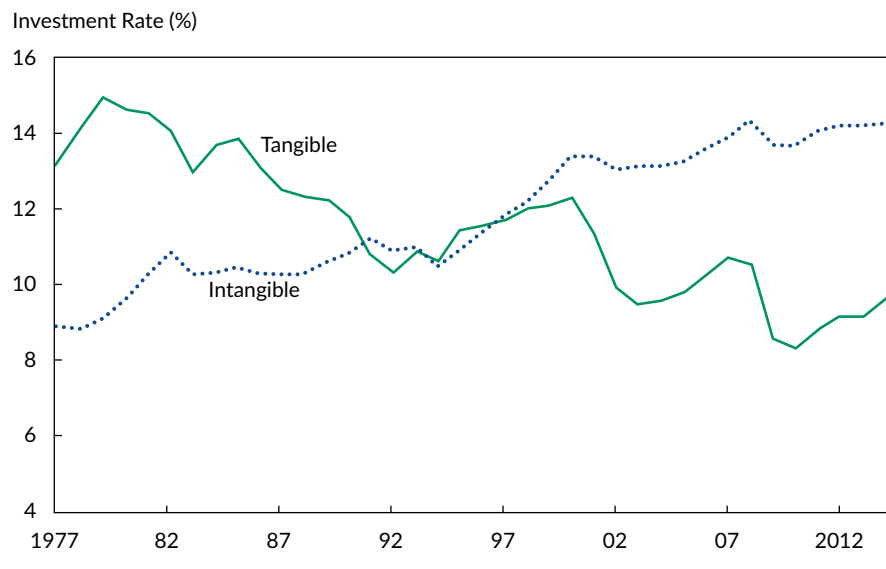


Figure 3. Intangible Investment Rises While Tangible Investment Falls



Source: We thank Professors Carol Corrado and Charles Hulten for providing us with this figure.

billion annually in R&D alone) are required to be expensed immediately, as are such regular expenses as salaries, rent, and interest, thus burdening reported earnings with the cost of the most valuable corporate investments in innovation and future growth (customer acquisition, R&D, internet content, software).¹⁰ Consequently, corporate income statements now mix expenses and substantial investments, stripping earnings of their most valuable use: an indicator of value creation. The depressed, often negative reported earnings of an R&D-intensive biotech company, of an internet or telecom enterprise building its customer franchise, or of a consumer goods company investing heavily in brand development obviously do not signal the periodic value created by, or the future growth of, such enterprises—and vice versa for companies with inflated reported earnings owing to decreasing investments in intangibles. For example, Juno Therapeutics, hailed by the *Economist* as being “on the forefront of the most promising area of cancer treatment in decades: immuno-oncology,”¹¹ reported R&D-driven losses of hundreds of millions of dollars since going public (2016 R&D: \$264 million). Is Juno a great innovator with a bright future, or is it a failing enterprise?

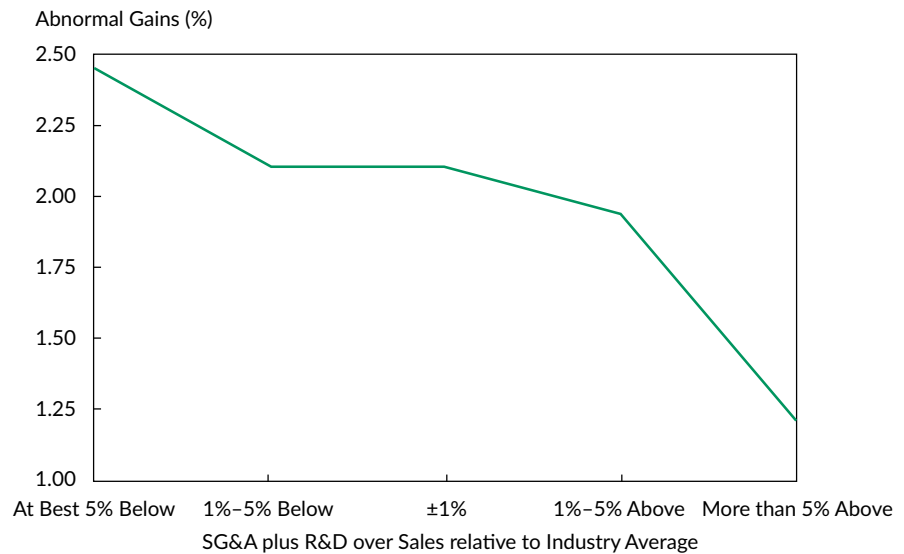
Worse yet, accounting for intangibles is not even consistent. Internally generated intangibles are expensed, whereas the same intangibles (say, patents or brands)—if acquired—are capitalized (a global practice). Thus, a company pursuing an innovation strategy based on acquisitions will appear more profitable and

asset rich than a similar enterprise developing its innovations internally. Consequently, reported earnings, assets, and market multiples (P/E, book-to-market ratio) cannot be compared within industries, and earnings definitely do not reflect intrinsic value creation.

To demonstrate the adverse impact of the expensing of intangibles on earnings’ usefulness, we can replicate the computation of the mean abnormal gains from a perfect prediction of consensus meets and beats (Figure 1) but with one change: We now classify the sample companies into five groups by *ascending* investment in intangibles, as measured by the ratio of R&D + SG&A to sales. Because most intangible investments are not reported separately in financial statements, we approximate these investments by the two items on the income statement that contain the most intangibles: R&D, reflecting the periodic investment in developing patents, trademarks, and new products and services; and SG&A (sales, general, and administrative expenses), reflecting investment in information technology, brands (advertising and promotion), customer acquisition, employee training, and the development of unique business processes (including payments to business and systems consultants).¹² Figure 4 depicts the gains from perfectly predicting consensus meets and beats (over 2011–2015) for companies with increasing investment in intangible assets.¹³

The fast-decreasing curve in Figure 4 makes it clear that as companies’ investment in intangibles

Figure 4. Gains from Beating the Consensus Decrease with Intangible Intensity



increases (from left to right on the x-axis), the gains from an earnings-based investment model fall rapidly. Stated differently, earnings' usefulness to investors declines sharply for companies that increasingly rely on intangible, value-creating assets. This intangibles-driven impact is not restricted to high-tech companies; the deterioration of earnings' usefulness is common to all companies engaged in process or product innovation worldwide.

While the ascent of intangible investments in companies' business models went unnoticed by accounting regulators, they were hard at work increasing exponentially the number and impact of subjective managerial estimates in the income statement. Accounting rules mandating the marking to market of both assets and liabilities, even those without market values ("It's not marked to market but, rather, marked to myth," quipped Warren Buffett), and rules requiring the writing off of impaired assets and goodwill are examples of recent accounting regulations that require substantial managerial estimates. These estimates, often unreliable and sometimes manipulated, significantly exacerbate the noise and inconsistency in reported earnings, burdening them with a host of one-time items (e.g., goodwill write-offs, restructuring charges) that have no bearing on future performance and growth.¹⁴

Is it any wonder that in recent decades, reported earnings have lost so much of their usefulness to investors, as clearly shown in Figures 1 and 2, that even a perfect earnings prediction model is no longer of much use? So, what is an investor to do? Change

the earnings-based investment model, of course. But in which direction?

An Alternative Investment Model

Consider a pharmaceutical or biotech company that beats the consensus estimate and/or reports sales growth but has a thin "product pipeline" (drugs or medical devices under development), with no drugs in advanced development, clearly indicating that the good earnings/sales news will be short-lived. Similarly, an oil and gas company that reports increasing revenues but fails to replace its oil reserves is bound to experience a revenue growth reversal. In contrast, an internet services or telecom company with disappointing earnings whose customer churn trends down, or with declining subscriber acquisition costs, will soon improve its profitability. Therefore, focusing investment analysis on past and current *consequences* of the company's business model—sales and earnings—often ignores fundamental business developments that affect future performance. An effective investment analysis should thus shift the focus from earnings (operating consequences) to the value creators of the enterprise—its "strategic assets"—and their deployment in value creation. This is the essence of our proposed investment analysis.

Strategic Assets. Our analysis derives from the ultimate, long-term objective of a business enterprise: achieving and maintaining a *sustained competitive advantage*—that is, being able to survive and

prosper in a competitive environment over the long haul. Companies with a sustained competitive advantage are the ones to invest in. And how is a competitive advantage gained and sustained? Primarily by having and successfully deploying *strategic assets*, which share the following three attributes:

- *They generate net benefits* (e.g., a growing customer base or retail outlets with increasing same-store sales).
- *They are rare*, in limited supply (e.g., wireless spectrum or airline landing rights).
- *They are difficult to imitate* by competitors (e.g., patents underlying leading drugs or key oil and gas properties).

Erosion of strategic assets, often hidden from investors, inevitably leads to loss of competitive advantage, even though reported earnings and sales typically rise for a while. Recall Dell: Its main strategic asset—the originally unique “build-to-order” business model, which differentiated Dell from its competitors and led to its prominence in the 1990s—was gradually imitated by its competitors. Failing to generate or acquire new strategic assets, Dell lost its competitive advantage in the early 2000s while still reporting increasing earnings (until 2005).¹⁵ When investors finally realized Dell’s loss of competitiveness, they naturally dumped the stock, leading to a collapse of market value in 2005–2006. Kodak, BlackBerry, and Sears exemplify similar tales of competitive advantage lost because of serious damage to their strategic assets.

To be sure, investors and analysts do not ignore strategic assets and competitive forces. Netflix’s rising market share and growing subscriber base fuel its share price, whereas Gap’s meandering strategy and execution weigh heavily on its stock. But the consideration of certain strategic assets in much of today’s security analysis is aimed primarily at predicting future earnings (or ROE or EBITDA [earnings before interest, taxes, depreciation, and amortization]), which is often the focus of analysts. Having raised serious doubts about the usefulness of earnings prediction earlier in the article, we now focus on the existence and deployment of strategic assets in order to assess the enterprise’s ability to sustain its competitive advantage. Such an *integrated* and *comprehensive* competitive analysis, rarely done by investors, involves the following:

1. *Taking inventory of strategic assets*: Compiling a list of the major strategic assets of the

enterprise; distinguishing between operating and dormant assets (e.g., patents under development or licensed out versus abandoned patents), active brands (enabling the charging of a premium product price) and brands in name only, or producing oil and gas properties and those under exploration versus inactive properties. Such inventory taking establishes the foundation—active strategic assets—of the company’s competitive advantage.

2. *Enhancing strategic assets*: Without continued investment and replenishment, even highly productive assets will wither on the vine (recall Dell). You should ask, Is the spending on R&D, technology purchases, customer acquisition, brand support, and employee training sufficient to maintain and grow the business? Cutting R&D or employee training to “make the numbers” clearly bodes ill for future growth.¹⁶
3. *Defending strategic assets*: These assets are vulnerable to competition (from similar products), infringement, and technological disruption, raising the question of whether the company’s assets are adequately protected by continuous innovation, patent defensive walls, and litigation.¹⁷ A continuous loss of market share clearly indicates a failure to protect assets.
4. *Asset deployment and value creation*: Are the strategic assets, along with other company resources, optimally deployed to create value (e.g., retail outlets with increasing same-store sales)? And what is this value? Note that in our analysis, the measurement of the periodic value created is a *byproduct* rather than the focus of the analysis. We prefer to measure value created by cash flows to avoid the multiple managerial estimates embedded in earnings. In contrast to the cash flows generally used by analysts (EBITDA), however, we *add* to cash flows the company’s investments in value-creating strategic assets, such as R&D, IT, and unusual brand creation expenditures, which are not really *operating* cash outflows.

This comprehensive competitive analysis is depicted in **Figure 5** and demonstrated in the following subsection.

Competitive Analysis of Subscription-Based Enterprises. Telecom, internet, media, and insurance companies, as well as software producers, provide their products and services on a

Figure 5. A Strategic Competitive Analysis



subscription basis, which ensures a stable cash flow at low distribution costs. The subscription model is expanding fast, even to traditional businesses. For example, Procter & Gamble recently launched an online, direct-to-customer subscription offer for its Tide PODS products. The major strategic asset of subscription-based companies (SBCs) is their *customer franchise* (Peter Drucker used to say that the aim of a business is to create a customer), supported by other assets, such as streaming content (Netflix's series) and patents and trademarks on key services. Many SBCs provide non-GAAP data on their customer franchise, enabling a thorough, forward-looking analysis of competitive advantage as well as the calculation of the value of their prime asset, *customer equity*. Using a hypothetical SBC, we conduct a competitive analysis of the customer franchise.

The fundamentals required for analyzing SBCs are presented in **Exhibit 1**. Most SBCs provide many—some even provide all—of these non-GAAP measures in materials that accompany earnings calls and investor days.¹⁸ A competitive analysis of the customer franchise—typically accounting for 50%–60% of market value (Bonacchi, Kolev, and Lev 2015)—starts with an examination of trends and across-peer differences in

- periodic customer additions,
- churn (deactivation) rates (e.g., policy renewals for insurance companies), and
- market share and penetration rates (e.g., radio listening in cars),

as detailed in the first column of Exhibit 1. Obviously, an increasing market share and decreasing churn rate bode well for sustained competitive advantage.

Key to developing the customer franchise and maintaining current customers (low churn) are investments in developing the franchise (second column in Exhibit 1): customer acquisition (advertising, promotion), content creation (Sirius XM Radio's unique programs streamed to car radios), design and engineering (Amazon's customer recommendation algorithms), brand development (GEICO's ads), and R&D (developing plug-in car devices used by insurance companies to monitor drivers). Periodic customer acquisition costs—often a substantial expenditure, particularly for early-stage SBCs—deserve special attention. Decreasing customer acquisition costs per user, coupled with an increasing subscriber base, indicate a growing brand value and competitiveness. The data provided by SBCs often enable the computation of the return on investment (ROI) in customers

Exhibit 1. Customer Franchise Fundamentals

Customer Status	Periodic Investments	Customer Value	Market Valuation
Subscribers, beginning	Customer acquisition costs	Average duration (1/Churn)	Price to customer value
Additions			
Deletions			
Subscribers, ending		×	
Market share	Content	Gross margin ^a	
		×	
	Design, engineering, and development	Subscribers, ending	
	Brand development		
	R&D		

^aGross margin = ARPU (average revenue per user) minus average operating costs per user, net of expensed investments in strategic assets (R&D, customer acquisition costs, etc.) per user.

by relating the periodic outlay for acquiring customers (CAC, or customer acquisition costs) to the newly created customer value: New customers $\times$ Average customer duration (1/Churn rate) $\times$ Gross margin per customer. The ROI for customer acquisition sheds light on the effectiveness of the company's strategy to acquire new customers (e.g., Sirius XM's drive to install its service in new and used cars), as well as on the company's competitiveness (a low or decreasing ROI for customer acquisition indicates a weakening of the competitive position).

Finally, to enable time-series and across-peer comparisons, we bring together the major attributes of the customer franchise in the form of the *total customer lifetime value*, which is the product of average customer duration, customer contribution, and the ending number of customers, with the following definitions:

1. Average customer duration = 1/Churn rate.
2. Customer contribution = Adjusted gross margin—namely, ARPU minus real expenses per user (GAAP expenses, excluding expensed investments in strategic assets, such as customer acquisition, content creation, and R&D).¹⁹

An example of customer value computation as applied to Sirius XM (fourth quarter, 2016): Average customer duration (1 over monthly churn of 0.019) = 52.6 months $\times$ Monthly customer margin (\$5.49; \$13.16 ARPU – \$7.67 investment-free expenses) $\times$ 31.3 million customers at quarter-end yields a total customer value of \$9.04 billion, amounting to roughly 50% of Sirius XM's market capitalization.²⁰ An increasing customer value indicates enhanced competitiveness and future growth.

Importantly, the ratio of share price to customer value per share is an insightful market valuation parameter that suggests, by comparison with peers, over- or undervaluation of shares. This indicator of the market's valuation of the company's major asset—customer value—is clearly more meaningful than the conventional market-to-book ratio, because the book value of SBCs does not include the major value creators in these companies (customer franchise, brands, and unique business systems).

Aren't Analysts Already Doing This? Is our proposed SBC competitive analysis *new*, or is it already being performed by analysts? To answer this question, we examined 10 reports on subscription-based companies issued by different analysts and

published in 2016–2017. Our examination indicated that analysts do consider some of our fundamentals (e.g., subscriber growth and churn rate) but with a different objective: generally, the prediction of short-term (next-quarter, full-year) EBITDA. In contrast, we consider these fundamentals, among others, to gauge the performance of the company's major strategic assets in order to evaluate its competitive edge. This analysis is conducted primarily by bringing together the major value drivers of SBCs to form a composite measure—total customer value—that allows for tracking the value of SBCs' major asset and computing market multiples (price to customer value) for valuation purposes. We saw no explicit total customer value calculations in the analyst reports we examined. Nor did we see in analyst reports the proposed adjustment of cash flows (or EBITDA) for the expensed investments in strategic assets (R&D, customer acquisition, etc.). Distinguishing between expenses and value-creating investments is crucial for adequate performance measurement and growth assessment. Finally, we did not see in analyst reports an explicit computation of the ROI for customer acquisition costs, useful for evaluating a company's customer acquisition strategy. Our competitive analysis is indeed very different from analysts' methodologies in both objective and process—and probably in inferences drawn.

Conclusion

Our message is twofold:

- GAAP-based reported earnings no longer reflect the periodic value changes (growth) of most business enterprises, and thus conventional earnings-based security analysis has lost much of its usefulness for investors in recent years.²¹ We support this assertion with both empirical evidence, showing that even a perfect prediction of corporate earnings no longer yields substantial gains for investors, and an articulation of the reasons for earnings' lost relevance.
- We assert that a shift of focus for security analysis and valuation is called for—from the prediction of earnings or related accounting measures to a comprehensive evaluation of an enterprise's competitive advantage through a careful consideration of its operating strategic assets and their deployment. In calling for a change in investment methodology, we offer an outline of our proposed competitive analysis and demonstrate its key aspects for subscription-based companies.²²

Generalizing our approach from SBCs, for each sector/industry, the core strategic assets should be identified (e.g., the product development pipeline and the in-line products of pharma/biotech companies or the asset portfolio—explored and unexplored—of oil and gas companies) and summary measures, akin to the total customer value of SBCs, developed (e.g., the value of oil and gas reserves or airlines' capacity and utilization). Such a systematic evaluation of strategic assets will enable investors to draw inferences about enterprises' competitive advantage and, by using market multiples, to assess over- or undervaluation of shares.

Although much of the information needed to perform this competitive analysis is not disclosed in GAAP-based financial reports, it can generally be found in materials accompanying earnings calls and investor days (and sometimes in the MD&A report). Aware of the serious shortcomings of financial reports, managers disclose a considerable amount of strategic information, albeit in a haphazard and inconsistent manner. Missing pieces can sometimes be obtained directly from management, but even a partial competitive evaluation would be an important addition to conventional security analysis. Certain items required for our proposed analysis, such as customer churn rate, are not audited and may be deemed somewhat less reliable than the GAAP-based audited numbers. But many of these items are fact based and thus less noisy than the GAAP-based numbers, which are derived mostly from managerial subjective estimates.

Finally, we realize that changing the focus of security analysis and valuation from earnings to a broader, long-term competitive analysis, based primarily on non-GAAP data, is not easy. In addition to the retooling of analysts, it requires a shift away from the deeply rooted primacy of an earnings "state of mind." We believe, however, that the time is ripe for our proposed change. The disappointing returns on managed funds in recent years should raise doubts about the continued usefulness of conventional security analysis. Our extensive empirical evidence on the loss of relevance of GAAP numbers, in both this article and our recent book, confirms these doubts. Certain major investors have already departed from the status quo. A front-page article in the *Wall Street Journal* recently reported that in the wake of protracted disappointing performance, "BlackRock Inc. [the world's largest asset manager] has started a shakeup of its stock-picking business, relying more on robots rather than humans to make decisions on what to buy and sell. . . . Many other firms that specialize in handpicking stocks are also struggling with low returns."²³ We propose a different course: Rather than replace analysts with robots, substitute an improved investment methodology for an outdated one.

Editor's Note:

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Notes

1. In our study, we determined whether a company missed, met, or beat the consensus by comparing its reported quarterly EPS with the most recent consensus estimate. We used the I/B/E/S database to derive both the consensus and the actual earnings numbers as well as the earnings release dates. We used all the companies with the required data on I/B/E/S. In some cases, the earnings surprises (actual earnings minus consensus) were obviously outliers. Therefore, we deleted the cases in which the prediction error (actual earnings minus consensus, divided by actual) was more than 100%.
2. In our study, we focused on abnormal, or excess, gains, subtracting from the raw returns the average contemporaneous returns on the stocks of companies of similar size ("size-adjusted returns")—that is, the excess gains over investing in all companies of similar size, irrespective of earnings performance.
3. The gains in the first period of Figure 1 (1986–1988) were lower than 6% but are based on a smaller sample; analysts' earnings forecasts were still not prevalent in the early 1980s.
4. In Chapter 2 of our book *The End of Accounting and the Path Forward for Investors and Managers* (2016), we provide corroborating evidence: (1) The gains from a perfect prediction (not just beating the consensus) of one-year-ahead annual earnings have historically been substantially higher than those from predicting cash flows; in recent years, however, earnings predictions have lost their advantage over cash flow predictions. (2) For 2012–2014, the average three-day gain from beating the consensus was a mere 0.5%, whereas the loss from missing the consensus was 1.5%. This evidence clearly indicates that in recent years, reported earnings have ceased to "move markets."
5. The evidence on gains from "momentum investing" is extensive and long-standing; see, for example, Jegadeesh and Titman (1993).
6. For more on this argument, see Wilmot (2016).

7. For the naysayers, we considered three additional explanations for our evidence on the diminishing gains from a perfect prediction of earnings: (1) "The average yield from investment in all stocks fell during recent decades, irrespective of earnings' relevance." Not so. The S&P 500 Index increased continuously (with some temporary drops) over 1986–2015, and the monthly value-weighted return on all stocks also showed no decreasing pattern. (2) "Earnings announcements are increasingly coupled with downcast guidance, depressing investors' reaction to the announcements." When we eliminated from our sample all quarterly earnings announcements coupled with forward-looking guidance, the results were virtually identical to those in Figure 1 (2010–2015). (3) "Reported earnings are affected by multiple one-time items that are excluded by analysts." True, but Figures 1 and 2 are based on I/B/E/S earnings ("Street Earnings"), which adjust earnings for one-time items.
8. For the original data and analysis (up to 2007), see Corrado and Hulten (2010).
9. Caterpillar bucked the intangibles drive by investing \$10 billion in plant and equipment in 2010–2013 and doubling the number of its plants in China. When markets subsequently slowed down, the increased capacity turned into a heavy burden for Caterpillar's financial results and stock price, leading to its CEO's resignation. According to a Caterpillar spokesperson, "The company has learned a lot of lessons on how you drive more capacity without spending on capex." See Tita (2016).
10. The immediate expensing of internally generated intangibles is mandated by US GAAP. The international accounting standards (IFRS), followed by many countries, deviate from the US practice by requiring the capitalization (asset recognition) of the development portion of R&D, under strict conditions. The costs of the research phase are universally expensed.
11. "The Trials of Juno," *Economist* (20 October 2016): 57.
12. SG&A is a noisy measure of investment in intangibles because it includes regular expenses, such as sales commissions. It is, however, the closest financial statement proxy for non-R&D intangible investment and is so used by researchers (e.g., Srivastava 2014).
13. We measure the ratio of R&D + SG&A to sales of each company *relative* to its industry mean ratio (abnormal investments). For example, "at best 5% below" (left group on the x-axis in Figure 4) includes all the companies whose ratio of R&D + SG&A to sales is 5% or more *below* their industry mean ratio—namely, companies with the lowest intensity of intangible investment.
14. Analysts and certain data vendors often adjust reported earnings by eliminating one-time charges, but this adjustment is incomplete. Various components of one-time items (e.g., restructuring costs, asset impairments) are embedded in cost of sales and SG&A expenses and are thus hidden from investors. For example, Tesco (Europe's largest supermarket chain) disclosed in its 2016 annual report that of £408 million in asset impairment charges, £299 million were included in cost of sales. Few companies, however, provide a complete disclosure of one-time items.
15. Over 2001–2005, Dell's R&D-to-sales ratio—indicating the creation of strategic assets—was a paltry 0.9%, compared with 6.0%, 5.1%, and 16.8% for Apple, IBM, and Microsoft, respectively. Tellingly, Dell's failure to innovate did not seem to bother investors until 2005, when earnings finally gave up.
16. For supporting evidence regarding earnings-boosting R&D cuts, see Shon and Yan (2015).
17. In 2011, Google acquired Motorola Mobility for \$12.5 billion, primarily for Motorola's thousands of patents, which, according to CEO Larry Page, the company would "continue to use to defend the entire Android ecosystem." See Guglielmo (2014).
18. A recent National Investor Relations Institute survey of investors reported that 88% of respondents found the "earnings deck" very valuable. See Corbin Advisors (2016).
19. Strictly speaking, the excluded investments should be replaced with amortization charges for finite-life assets.
20. For convenience, we abstract the customer value computation from expected customer growth and the discounting of future revenues. This analysis is intended to be illustrative only and does not consider all the factors that would be involved in a full valuation of the company.
21. This finding is probably a contributing factor in the generally declining performance of most managed portfolios and hedge funds in recent years.
22. We apply this comprehensive competitive analysis to four leading sectors—media and entertainment, oil and gas, insurance, and pharma/biotech—in Chapters 11–15 of our recent book (Lev and Gu 2016).
23. See "How BlackRock Is Bringing Its New Quant Funds to the Masses" (30 March 2017): <https://blogs.wsj.com/moneybeat/2017/03/30/how-blackrock-is-bringing-its-new-quant-funds-to-the-masses/>.

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