

The Value of Transparency and the Cost of Complexity

Aswath Damodaran

Stern School of Business

January 2006

The Value of Transparency and the Cost of Complexity

It is clear that some firms are more forthcoming about their financial affairs than other firms, and that the financial statements of a few firms are designed to obscure rather than reveal information. While differences in accounting standards across countries was viewed as the primary culprit for this lack of transparency until recent years, the convergence in accounting standards globally has made it clear that no matter how strict accounting standards are, firms will continue to use their discretionary power to spin and manipulate the numbers that they convey to financial markets. The questions we face in valuation are significant ones. How do we reflect the transparency (or the opacity) of a firm's financial statements in its value? Should we reward firms that have simpler and more open financial statements and punish firms that have complex and difficult-to-understand financial statements? If so, which input in valuation should be the one that we adjust? This paper begins by examining the phenomenon of opacity in financial statements and why some firms choose to be opaque. It follows up by considering some of the empirical evidence on whether markets discount the value of complex firms to reflect the difficulty faced in valuing them. It closes by evaluating some of the ways in which we can adjust discounted cash flow valuation models for this difficulty.

When valuing firms, we draw on financial statements for information and trust these statements to provide us with reliable data on what a firm earns, what it owns and how much it owes. Not all financial statements, though, are created equal, and some are clearly more difficult to work with (from a valuation perspective) than others for two reasons. One is accounting malpractice, where financial statements withhold relevant and material information or provide incorrect information about the firm. The blame for misleading and incomplete financial statements does not necessarily lie with the regulatory authorities and tightening disclosure laws will not make the problem go away. The other is corporate complexity. Even with equally informative financial statements, some companies are easier to value than others simply because they are less complicated; Wal-Mart is a much more easier company to value than General Electric.

In this paper, we consider whether the complexity of a company should have an effect on its value. To answer this question, we begin by discussing why complexity might matter to investors and then examine a much thornier question: What is it that makes a company complex and how do we measure complexity? We then consider the empirical evidence on how investors deal with complexity when valuing companies. We close the paper by looking at ways in which we can incorporate complexity into both discounted cash flow and relative valuations.

An Experiment

Consider the following experiment. We are analyzing two firms with the same overall market risk exposure and the same financial leverage. Assume that both firms have the same operating earnings, similar returns on capital and that you expect the same growth rate in the operating income. Finally, assume that firm A is a firm in a single business with open and easy-to-understand financial statements whereas firm B is a firm in multiple businesses with complex and difficult-to-decipher financial statements. Given that they have the same financial fundamentals, should they trade at the same value? If not, which of these two firms should be valued more highly and why?

In conventional discounted cash flow valuation, we would attach the same value to both firms.¹ After all, the after-tax cash flow for a firm comes from its operating income and reinvestment needs, and no adjustments are made for how complex a firm is in this calculation. The discount rate is computed based upon the non-diversifiable risk in the equity of the firm and the default risk of its debt. It is true that the beta for a multi-business company will be a weighted average of the betas of the different businesses it is in, but that does not penalize a diversified firm. In fact, we often give diversified (and complicated) firms a slight advantage in discounted cash flow valuations by allowing them to carry more debt and have lower costs of capital.

In relative valuation, we are even more haphazard about how we deal with complexity. We compare firms on PE ratios or EV/EBITDA multiples and even if we adjust for differences across firms on fundamentals, these fundamentals tend to be financial (risk, growth and cash flows) and almost never relate to complexity. As with DCF valuation, when we do adjust, we give complex firms an advantage by arguing that they should trade at higher multiples of earnings or book value because they are more diversified and less risky.

In this paper, we will argue and present evidence that most investors would value the simpler firm more highly than the complex firm, thus discounting the latter firm's value for both its complexity and its opaque financial statements. Are they being irrational or are we missing an important aspect of value in valuation models? We believe it is the latter and we will present ways in which we can measure complexity and incorporate it into our valuation models.

Defining Complexity

With a transparent firm, the information that we need to value the firm is not only available and accessible on a timely basis, but is also relatively simple to interpret and

¹ Since the firms have similar risk exposure and financial leverage, they should have the same cost of capital. Since their return on capital is equal, they would also have the same reinvestment rates and free cashflows to the firm. The lack of transparency would be considered diversifiable risk and would not affect the cost of capital.

use in valuation models. If we define a complex firm as one where converting information to valuation inputs is difficult, we can already see that defining complexity is complicated. It cannot be defined in terms of the quantity of information, where transparent firms are defined as those that provide more information. After all, the information has to be credible and usable to have value. In fact, complexity in the context of valuation can be take two different forms. In the first, the information needed to value the firm is either not available or it is garbled, which is an information disclosure problem. Note that this problem can be created either by the absence of relevant information or the presence of extraneous information. In the second, the information may be available, but the firm itself is so complex (either because of its organizational structure or its business interests) that valuing it becomes difficult to do.

By separating the two complexity factors, we can already see that increasing and tightening disclosure laws may reduce the first problem, though regulators have to weigh off the benefits of requiring more disclosure against the costs of creating more complicated financial statements, but it can do little about the second. In this paper, we consider complexity from both sources, the sources for the complexity and the motivations of companies that deliberately create this complexity.

Sources of Complexity

Using the broad definition of complexity laid out in the last section, we can start looking at the sources of complexity. Some complexity can be attributed to external forces – regulatory authorities and accounting standards boards – but most can be traced back to the firm. In other words, firms with complex and difficult to use financial statements have no one to blame but themselves for most of the complexity.

Regulatory Framework

Since we defined complexity to include both the absence of relevant information and the presence of extraneous information, some of the responsibility for complexity has to be borne by the regulatory authorities governing financial disclosure. The financial statements of firms in many emerging markets are often incomplete and leave out large chunks of relevant information, largely as a consequence of lax regulatory requirements.

Berglof and Pajuste (2005) examine the financial statements of 370 Central and East European firms and find widespread non-disclosure of basic information on governance and performance.² However, they find that disclosure policies depend more upon the legal framework and practice in the country in which a company is incorporated, rather than the company's characteristics. It stands to reason that companies that operate in markets where poor disclosure policies are condoned will have little incentive to improve their practices.

Accounting Standards

Based upon the last section, it would seem that more disclosure is better than less and that requiring more information should therefore make firms more transparent. In this section, we will examine the underside of these disclosure requirements, which is more complicated and difficult-to-use financial statements. In fact, accounting standards and practices bear some of the responsibility for the increasing complexity of financial statements, especially in the United States and Europe. Some of the problems with accounting statements arise from the way in which accounting standards are written and the leeway that they provide to firms in their interpretation, and some of the problems arise from the changes that have been made to these standards, often with the best of intentions.

Inconsistency in applying accounting principles

The accounting standards that are on the books today were originally written for manufacturing firms that dominated business forty years ago, and have been amended and modified to fit the very different firms that exist in the market today. The accounting rules developed for the industrial age have not traveled well into the information age. The way in which the intangible assets of technology firms are valued in balance sheets offers some of the most visible example of the shortcomings and contradictions that bedevil current day accounting. To illustrate, a firm that buys a patent from another firm will

² Berglof, E. and A. Pajuste, 2005, Why do firms disclose and why? Enforcing Corporate Governance and Transparency in Central and Eastern Europe, SSRN Working Paper.

show the patent as an asset, whereas another firm that develops a similar patent based upon internal research will not show the patent as an asset at all.³ But there are other examples. A retail firm that borrows money and buys its store sites will show the sites as assets and the borrowing as debt, but a competing retail firm that leases these store sites will often show not show any of the leases as debt and will also report no assets.⁴

The ways in which accounting statements deal with employee options and acquisitions have also created problems for investors. Firms that use options to reward managers and employees clearly use them as management compensation. It stands to reason, therefore, that these options should be valued and treated as operating expenses in the period in which they are granted. Under current accounting standards, we ignore these options when they are granted and consider them only when they are exercised.⁵ The use of pooling and purchase accounting in acquisitions, which was permitted until 2001, allowed firms that qualify for pooling to essentially hide the cost of acquisitions from most investors.⁶

³ This is a direct consequence of the fact that money spent on research and development is expensed in the year of the expenditure, even though it is really investment for the future, i.e. capital expenditure (which should be spread out over time).

⁴ Most retail store leases are operating leases and are treated as operating expenses in the United States. Outside the United States, almost all leases are treated as operating expenses.

⁵ Even at exercise, firms use different practices to reflect the exercise of options. Some show the exercise value as expenses, while others make the adjustments to book equity in the balance sheet. There is some hope, though, that sanity will prevail. Starting in 2006, FASB 123R will require that options be valued and expensed at the time that they are granted.

⁶ With pooling, firms can add up the book values of the acquiring and acquired firm and report it as book value for the combined firm. The premium paid over book value is ignored. In purchase accounting, the premium over book value show sup as goodwill on the combined firm's balance sheet and is amortized over time.

Why might this add to the complexity of financial statements? Depending upon what assets they invest in, and how they structure these investments, firms can hide assets and debt from investors. To be fair to accountants, there is usually enough information provided in the footnotes to financial statements to correct for many of the inconsistencies in the United States.⁷

Fuzzy Accounting Standards

In the last few years, we have acquired a sense of the discretionary power possessed by firms in the measurement of income and capital. During the 1990s, for instance, more aggressive firms used the leeway that was available to them in the accounting standards to report higher earnings, lower capital invested and much higher returns on capital. Consider three examples:

- *One Time Charges:* Firms have been increasingly inventive in their use of one-time and non-operating charges to move normal operating expenses below the operating income line. In fact, the appearance of these charges year after year essentially overstates operating income and can simultaneously reduce the book value of capital invested.⁸
- *Hidden Assets:* Firms have also used the wiggle room in accounting standards to move assets and debt off their books, using special purpose entities and partnerships.⁹ While some of these firms use these entities as legitimate devices to reduce their cost of debt and then provide information about their existence in their financial statements, others use them to hide their indebtedness from the public.

⁷ See my web site for a fuller discussion of how to convert operating leases to debt and R&D into capital assets.

⁸ In fact, analysts in the UK coined the term EBBS (Earnings before bad stuff) to represent the reported operating earnings of some of the more aggressive firms.

⁹ Using quirks in accounting rules, a firm can carve out some of its assets into a special purpose entity and have the entity issue debt. If the assets carved out are low risk (say receivables), the debt that is issued will often have a lower interest rate.

- *Earnings Smoothing and Management:* Firms have used a variety of techniques to smooth earnings out over periods. In the 1990s, Microsoft routinely underestimated its earnings from upgrades to both operating and applications software, building up a reserve it could draw on in those quarters where its true earnings threatened to fall short of earnings expectations. Intel reported the price appreciation on the equity investments it had in other companies as profit and used these additional earnings to meet market expectations. During the stock market boom of the 1990s, some firms reported some of their excess pension fund assets as profits.¹⁰ What harm is done by these practices? For better or worse, investors who look at earnings stability as a measure of equity risk are misled into believing that these firms (and others like them) are less risky than they truly are.

Does this mean that we should eliminate all discretionary power granted to firms? We do not believe so, since there are clearly one-time expenses and income that should be separated from operating expenses and income. Can more effective policing by auditors prevent this type of abuse? Perhaps, but we seriously doubt it. In other words, no matter how strictly an accounting rule is written, there will be some firms that are more aggressive than others in their interpretation of the rule. The irony is that tightening the rules and adding new ones only increases the gulf between aggressive companies that still find loopholes and conservative companies that follow the rules as written.

Unintended consequences of increased disclosure requirements

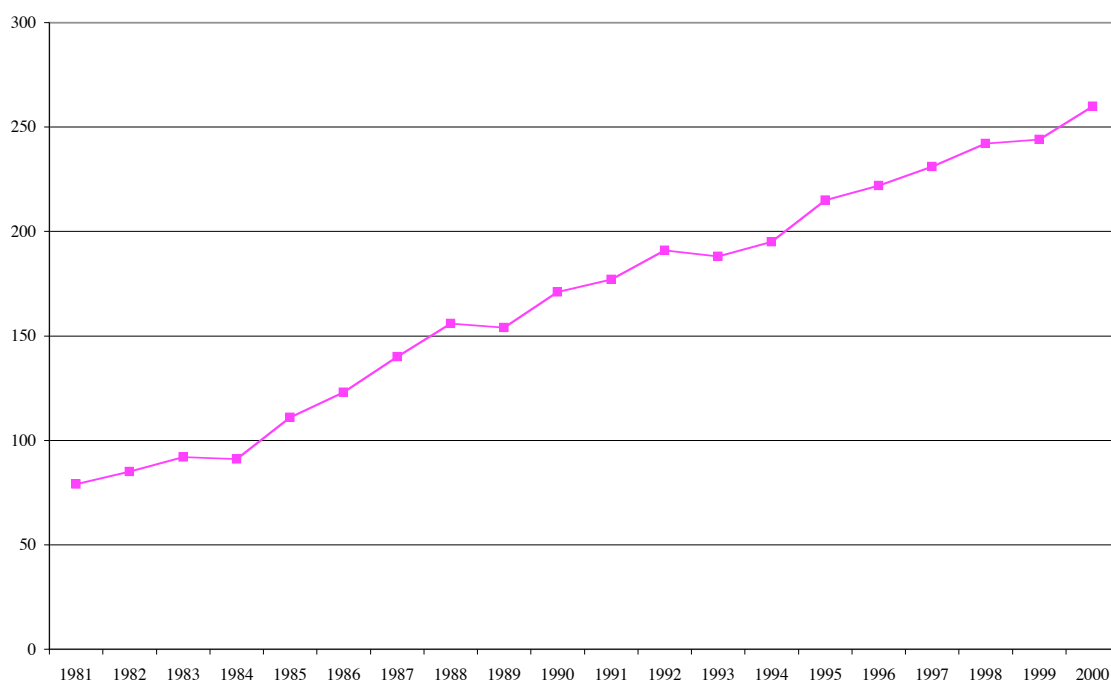
Over the last three decades, we have seen an increasing focus on information disclosure in accounting statements. While this trend has its roots in the United States, it has spread to other markets as well. While the objective of increased disclosure is noble – to provide investors with more information about the companies that they invest in – there have been unintended side consequences that are not so favorable. First, the proliferation of accounting rules and the level of detail required in reporting have made

¹⁰ With a defined benefit pension plan, an increase in the value of the pension assets (invested in stocks) can cause over funding. Note though that the reverse will happen if stock prices drop.

financial statements much longer and more complex. For example, consider the liability side of the balance sheet of a typical U.S. firm. Thirty years ago, it would have shown current liabilities (accounts payable, supplier credit and short term debt), long term debt (bank loans and corporate bonds) and shareholders' equity (paid-in capital and retained earnings). Today, you would see in addition to these three items, a host of other liabilities including unfunded pension liabilities and health care benefits and provisions for future legal liabilities. Second, the increasing level of detail both in the financial statements themselves and the footnotes that follow often obscures more important information about the firm. In other words, financial statements sometimes become data dumps that are difficult to navigate for investors.

To provide an illustration of how much accounting rules have added to the heft of financial statements, we looked at the number of pages in the 10Ks filed by Procter and Gamble, with the SEC starting in 1981 and going through 2000 in figure 1. While some of this increase can be traced to the increasing complexity of P&G's businesses, a large portion of it reflects the effects of new accounting edicts and rules.

Figure 1: Number of pages in 10K- P & G



The process continues unabated. Each accounting scandal adds to the pressure on both legislators and accounting standards boards to add new requirements on what needs to be disclosed to investors. Thus, the passage of Sarbanes-Oxley will undoubtedly generate an increase in the volume, if not quality, of financial statements in the next few years. In both Europe and the United States, the push towards “fair-value” accounting, while well intentioned, has added to the heft of financial statements and made them more difficult to work with, rather than less.

Business Mix

Some firms are more complex than others simply because they operate in multiple businesses, often with little in common. General Electric, for instance, has operations in more than 10 distinct businesses, with very different margins and risk profiles. Analyzing GE is therefore more difficult than analyzing a firm like Adobe Systems, a firm that produces and sells only software. Why do firms get into different and often unrelated businesses? In the 1960s and 1970s, the impetus came from the desire to diversify, which it was argued, would reduce risk. In the 1980s, the argument was that a well-run firm could take over poorly run firms in other businesses and use its superior management to increase value. Whether these benefits actually materialize is open to question, but the complexity added to financial statements is one potential cost.

It is not just the number of different businesses that a firm is in that generates complexity but the differences across the businesses. Manufacturing firms with financial arms (GE Capital, GMAC, Ford Capital) are particularly difficult to work with because there are huge differences in financial leverage and operating characteristics between the financial and non-financial parts of the firms.

Structuring of Business

When firms enter new markets or businesses, the way they structure these businesses can have an effect on their complexity. For instance, a firm that keeps each business separate and independent (with its own financial statements) should be easier to value than a firm that envelops all the businesses into one entity. In some cases, firms can exacerbate problems by creating subsidiaries for each of their businesses and holding less

than 100% of these subsidiaries. In the United States, for instance, a firm that owns 51% of a subsidiary will have to consolidate its statements and show minority interests as a liability.¹¹ A firm that owns only 15% of a subsidiary may show only its shares of the dividends in the subsidiary and reflect none of the assets and liabilities of the subsidiary on its balance sheet. A good example of complexity created by structuring would be Coca Cola's split-up of its bottlers in the 1980s. By making these bottlers independent entities and reducing its ownership in the bottlers below the majority threshold, Coca Cola was able to take its lowest-return assets of its books and report significantly higher returns on capital. In reality, however, the partial ownership of the bottlers obscures the true returns and financial leverage of the consolidated firm. After all, Coca Cola and its bottlers are a composite entity, with the value of one deriving from the existence of the other.

The problems with cross holdings are most visible at Asian companies, especially the older conglomerates. The complicated cross holdings at these firms reflect not just the long history of these firms as private businesses (where the intent was to report as little in earnings as profits) but the current desire on the part of the incumbent managers to control these firms with minimal holdings. In some cases, the cross holdings are in other private businesses, with little or no information provided on these businesses. Business structures that are created to enhance control often contribute to complexity. For instance, the pyramid structure (described more fully in my paper on valuing control) favored by many Asian and European firms can make financial statements less transparent, because the controlling stockholders at the top of the pyramid can move money across group companies.¹²

¹¹ Consolidation requires that 100% of the revenues, EBITDA and debt of the subsidiary be shown as part of the parent company's balance sheet. The minority interest represents the portion of the subsidiary firm that does not belong to the parent company.

¹² This argument is made in Johnson, Simon, Boone, Peter, Breach, Alasdair, and Fridman, Eric, 1999, *Corporate Governance in the Asian Financial Crisis, 1997-1998*, MIT Manuscript; Khanna, T. and K. Palepu, 2000, *The Future of Business Groups in Emerging Markets: Long-Run Evidence from Chile*, *Academy of Management Journal*.

Growth Strategies

Firms can grow either through acquisitions or through internal projects. As a general rule, accounting for internal projects is far simpler and more transparent than accounting for acquisitions. In fact, the discretionary choices for acquisitive firms increase on the following dimensions:

a. Type of firm acquired: The accounting effects of acquisitions can vary widely depending upon the type of firm acquired. For instance, acquiring a young high growth firm with significant intangible assets will generate far more goodwill than acquiring a mature company with tangible assets.

b. Payment method: Acquisitions can be paid for with cash, acquiring company stock or some combination of the two, and the payment mechanism can have consequences not only for how the acquisition is recorded on the financial statements but also on the tax liabilities that accrue to the firm.

c. Allocating purchase price: Since pooling is no longer allowed in acquisitions, the entire purchase price has to be recorded for all acquisitions but that purchase price is first allocated across the assets of the target firm and the balance is recorded as goodwill. While there are guidelines and restrictions on purchase price allocation to existing assets, there is enough discretion in the process that different appraisers can arrive at different estimates for asset and goodwill value.

d. Dealing with Goodwill: Once goodwill has been recorded on the books, firms are required to revisit that estimate each year and record any loss in value that may have accrued (as an impairment charge) over the prior period. Here again, there is some discretion in both the magnitude and the timing of these charges. More aggressive firms will take smaller and more delayed impairments than more conservative firms.

These choices, in turn, make financial statements more difficult to use, not just in the year of the acquisition but also in subsequent periods.

Financial Choices

Three decades ago, a firm's choices when it came to financing were straightforward. You could use common stock (equity) or bank loans/ corporate bonds (debt) and reflect the amounts raised from each on your balance sheet. As financing

choices have proliferated, and new and different ways of raising funds (convertibles, warrants and other hybrids) have come into being, the balance sheet has become more complicated. An entirely new category of funding that accountants call quasi-equity, representing hybrid securities (which are part debt and part equity) now plays a prominent role in many balance sheets. Firms have also become more inventive (with the help of investment bankers) at keeping debt off their books.

Consider one example. In the early 1990s, investment bankers created a security called trust preferred stock. These securities allowed firms to generate the tax benefits of debt but were treated as equity by the ratings agencies. This freed firms that otherwise would not have been able to borrow, because of bond ratings constraints, to use trust preferred stock for expansion and investments. While ratings agencies did catch on over time to the fact that these securities were more debt than equity, creative bankers devised newer and more complicated instruments to let companies borrow money without having the tag “debt” attached to it. The process culminated in the collapse of Enron, where the accumulated debt in hidden partnerships and entities eventually came together to destroy the firm.

In Summary

Complexity in accounting statements is a reflection of broad trends in accounting that affect all companies and conscious choices made by firms on business mixes and how they structure and present the results of their operations (accounting and financing choices). Differences in transparency across countries can be best explained by differences in accounting, regulatory and political environments, but there are also significant differences across companies within any country. These differences can be best explained by how the firm is structured, the businesses it operates in and how it exercises its discretionary power within existing accounting rules. Thus, a firm that is in a single business can end up with very complex (and difficult to understand) financial statements because it uses complex financial instruments to raise funds and is aggressive in its accounting choices. A firm with a complex business mix can work to make its financial statements transparent by going well beyond the legal requirements of disclosure.

Reasons for Complexity

Firms with complicated financial statements have to bear much of the responsibility for the complexity, no matter how strong or weak the accounting standards are. This is because accounting standards establish a floor on what has to be revealed and not a ceiling. Firms that want to reveal more to their investors can always do so. Infosys, an Indian software firm, for example, has financial statements that are more transparent than those provided by most U.S. firms, even though Indian accounting standards on disclosure are much weaker than U.S. accounting standards.¹³ In this section, we consider some of the reasons why firms may choose to make their financial statements more diffuse and difficult to understand.

Control

Many incumbent managers fear hostile takeovers, and attempt to preempt hostile acquirers by structuring a bewildering array of subsidiaries and holding companies to hide their assets, and by creating new financial securities – common stock with different voting rights, for example. How do these actions keep hostile acquirers away? First, information that is not available to investors is also unavailable to potential hostile acquirers, making it difficult for them to detect when a firm's assets are being poorly managed and under valued. Second, the complicated holding structure and financial instruments used by the firm can make it difficult to gain effective control of the firm. It should come as no surprise that firms that are transparent about their financial standing also tend to be transparent about corporate governance, whereas firms with weak corporate governance often have opaque financial statements.

As we noted in the prior section, family run firms in emerging markets have used cross holdings and pyramid structures to effectively cement control in the hands of family members. By not providing complete information on cross holdings, they make it

¹³ The incentive to provide more complete financial statements tends to be greatest for those emerging market companies that have listings in developed markets. Chinese companies listed in the UK for instance provide far more information on performance and governance than Chinese companies that are listed only in Shanghai.

difficult for stockholders who want to ask them relevant questions about the profitability and value of these investments.

As a final note, there seems to be some interplay between political connections and the transparency of financial statements. In a series of studies, Riahi-Belkaoui finds that the opacity of earnings is directly correlated to the percentage of politically connected firms in a market.¹⁴

Tax Benefits

Firms can sometimes reduce their tax burdens by creating holding structures in low-tax domiciles. For instance, it is not uncommon for firms in the United States to have subsidiaries in tax-free locales such as the Cayman Islands and Panama and to funnel income into these subsidiaries.¹⁵ Complex holding structures also allow firms to shift income from one subsidiary to another, using transfer pricing and inter-company loans. In other words, firms cannot afford to be transparent with shareholders if they prefer opacity when it comes to the tax authorities. As a general proposition, complexity in tax laws will generate complexity in financial statements. Legislators who bemoan the latter should consider their role in creating the former.

Operating and Business Concerns

For some firms, at least, there are real costs to disclosing more information to financial markets. Competitors may use the information to fine-tune their strategies and employees and customers may respond negatively to the information in financial statements, especially when the firm is in financial trouble. In fact, there is the possibility that the perception that a firm is in trouble can create a death spiral, where customers stop buying the firm's products and employees abandon ship, thus creating even more financial trouble, until it becomes a self-fulfilling prophecy.

¹⁴ Riahi-Belkaoui, A., 2003, Politically-connected firms: Are they connected to earnings opacity?, SSRN working paper.

¹⁵ There is clearly the sensitive issue of when tax avoidance becomes tax evasion. We do not have the expertise to make that legal judgment.

The potential negative effects of more disclosure (and transparency) have been examined in Almazan, Suarez and Titman (2002).¹⁶ They argue that more transparency can reduce firm value, when indirect bankruptcy costs are high. They note that for some firms, increasing transparency may result in more conservative capital structures, less reliance on external funding and a turning away of positive net present value investments. They argue technology firms, in particular, can be hurt by more transparency in financial statements. We have little sympathy for this argument, since these firms chose to access public capital markets for additional funds. In return for the access to capital, they have undertaken to provide information to investors. If they feel that the costs exceed the benefits, they can always go back to being private businesses.

Deceit

We have saved the most odious of the reasons for complexity for last. Firms sometimes create complex structures to fool investors into believing that they (the firms) are worth more than they really are or that they owe less money than they truly do. In many cases, what starts as a small evasion mushrooms over time to become a large one, and when the truth comes, as it inevitably will, there are large economic and social costs. The executives at these firms will complain mightily about the accusations of deceit, and they will usually find ways to rationalize their actions.¹⁷ Note, though, that investors and analysts should not be relieved of their responsibility when firms pull off these con games. For the deceit to work, you often need analysts who look the other way and do not ask tough questions of managers, and investors who base their investment choices on past history and little analysis.

Measuring Complexity

¹⁶ Almazan, A., J. Suarez and S. Titman, 2002, Capital Structure and Transparency, SSRN Working Paper.

¹⁷ We just took the debt of the books to reduce the interest rate that we pay, they will claim, but we did mention it in a footnote. In response, we would argue that investors should not have to troll through footnotes to find out how the firm owes.

While investors and analysts may increasingly bemoan the increasing complexity of financial statements, there is no simple or easy measure of complexity. There are some who would argue that they know complexity when they see it, but this is not a very satisfying or objective measure of complexity. In this section, we consider some ways in which we can measure the complexity of a firm's financial statements:

Volume of data in financial statement

A simplistic (but surprisingly effective) measure of complexity is the volume of data in a financial statement. For instance, the 10K filings made by firms with the Securities and Exchange Commission (SEC) range in size from less than 200 pages to in excess of 1000 pages. In table 1, we summarize the length of the filings for the 2004 financial year for ten large market capitalization firms in the United States.

Table 1: Complexity in Financial Statements: U.S. companies

<i>Company</i>	<i>Number of pages in last 10Q</i>	<i>Number of pages in last 10K</i>
General Electric	65	410
Microsoft	63	218
Wal-mart	38	244
Exxon Mobil	86	332
Pfizer	171	460
Citigroup	252	1026
Intel	69	215
AIG	164	720
Johnson & Johnson	63	218
IBM	85	353

Using this measure, Citigroup and AIG have the most complex financial statements, whereas Microsoft, Intel and Johnson & Johnson have the least complex statements. The reason is that it is a simplistic measure, of course, is because a short 10K can reflect a simple business and financial structure or just indicate an absence of information about the firm's operations. However, looking at differences across firms on the length of the 10K does provide some interesting insights into why some companies become more complex (at least in terms of the 10K length):

- Non-financial service firms with capital arms (GE Capital, IBM) tend to have longer annual reports and financial statements than similar firms without these capital arms.

As we noted earlier, these financial subsidiaries resemble banks much more closely than they do the firms that they are attached to; GE Capital is more comparable to a large financial service firm than it is to any part of GE. Consequently, firms have to go to great lengths to separate the financial obligations and dealings of these subsidiaries from the rest of the firm to make the statements meaningful.

- Acquisitive firms tend to have longer financial statements than firms that grow through internal projects. The accounting for an acquisition is not only more complicated (with goodwill and purchase price allocation across assets) in the year of the acquisition but it continues to have ripple effects in the following years (as goodwill gets amortized or impaired).
- Firms that operate in multiple businesses and multiple countries tend to have longer financial statements than single business companies that operate only in domestic markets. Again, we are not suggesting that diversification across countries and businesses is bad but that this may be one of the costs that has to be weighed against the potential benefits of such diversification.

The Opacity Index

In the late 1990s, Price Waterhouse developed an “opacity index” to measure the transparency (or absence thereof) of financial statements in different countries. Defining opacity as the “the lack of clear, accurate, formal, easily discernible, and widely accepted practices”, Price Waterhouse looked at five factors.

$$O_i = 1/5 * [C_i + L_i + E_i + A_i + R_i],$$

where i indexes the countries and:

O refers to the composite O-Factor (the final score);

C refers to the impact of corrupt practices;

L refers to the effect of legal and judicial opacity (including shareholder rights);

E refers to economic/policy opacity;

A refers to accounting/corporate governance opacity; and

R refers to the impact of regulatory opacity and uncertainty/arbitrariness.

They based the country scores for each factor on a survey of CFOs, equity analysts, bankers and Price Waterhouse employees in 35 countries in the third and fourth quarters

of 2000. The survey responses were converted into a numerical score and weighted to arrive at each country's opacity measure. Table 2 summarizes the results for the 35 countries in 2000.

Table 2: Price Waterhouse Opacity Index - 2000

<i>Country</i>	<i>C</i>	<i>L</i>	<i>E</i>	<i>A</i>	<i>R</i>	<i>O-Factor</i>
Argentina	56	63	68	49	67	61
Brazil	53	59	68	63	62	61
Chile	30	32	52	28	36	36
China	62	100	87	86	100	87
Colombia	48	66	77	55	55	60
Czech Republic	57	97	62	77	62	71
Ecuador	60	72	78	68	62	68
Egypt	33	52	73	68	64	58
Greece	49	51	76	49	62	57
Guatemala	59	49	80	71	66	65
Hong Kong	25	55	49	53	42	45
Hungary	37	48	53	65	47	50
India	55	68	59	79	58	64
Indonesia	70	86	82	68	69	75
Israel	18	61	70	62	51	53
Italy	28	57	73	26	56	48
Japan	22	72	72	81	53	60
Kenya	60	72	78	72	63	69
Lithuania	46	50	71	59	66	58
Mexico	42	58	57	29	52	48
Pakistan	48	66	81	62	54	62
Peru	46	58	65	61	57	58
Poland	56	61	77	55	72	64
Romania	61	68	77	78	73	71
Russia	78	84	90	81	84	84
Singapore	13	32	42	38	23	29
South Africa	45	53	68	82	50	60
South Korea	48	79	76	90	73	73
Taiwan	45	70	71	56	61	61
Thailand	55	65	70	78	66	67
Turkey	51	72	87	80	81	74
UK	15	40	53	45	38	38
Uruguay	44	56	61	56	49	53
USA	25	37	42	25	48	36
Venezuela	53	68	80	50	67	63

Based on this measure, Singapore has the least opacity whereas China and Russia have the most opacity in their financial statements. Note that this measure is a composite

measure that includes, in addition to accounting transparency, other factors such as corruption and legal practices. The survey questions that directly relate to accounting opacity do provide an interesting perspective on what the survey participants view as the key accounting issues and problems in each country. Among the most common problems noted were:

- a. *Failure to disclose related party transactions*, where there are potential conflicts of interests between officers of the company and its stockholders. (Numerous emerging markets)
- b. *Reliability of exhibits*: Exhibits backing up the financial statements either are missing or do not include important information. (China, Russia)
- c. *Inflation accounting*: In many cases, attempts to do inflation accounting resulted in more complicated financial statements and not more informative ones. (Chile, Colombia)
- d. *Inconsistent rules on consolidation and treatment of goodwill* (U.S., U.K., Singapore and South Africa)
- e. *Dual bookkeeping*: Firms maintain different financial statements for different authorities, leading to confusion about a firm's true financial standing.

In recent years, the Kurtzman group, a global consulting firm, has refined and extended the opacity index to incorporate 65 variables. In their survey in 2004, Finland and the UK ranked highest for transparency while Venezuela, Lebanon and Indonesia were at the bottom of the rankings. In general, they find that poorer countries score worse on the opacity index than wealthier countries.¹⁸

Governance and Disclosure Indices

The accounting scandals that engulfed Enron, Tyco and Worldcom, and the ensuing anxiety among investors about accounting manipulation led to numerous services offering measures of how fully firms were disclosing information. Standard and Poor's, for instance, created a new governance information and analytical service which looked at the corporate disclosure patterns of more than 1500 companies listed globally on three dimensions – ownership structure, financial information and board/management

¹⁸ Kurtzman, J, G. Yago and T. Phumiwasana, 2004, The Global Costs of Opacity, MIT Sloan

structure.¹⁹ Appendix 1 summarizes the questions that they asked in coming up with disclosure scores on each dimension and the scores across regions on each dimension are summarized in table 3 (for 2002):

Table 3: Transparency and Disclosure Rankings of Companies by Region

	<i>Composite</i>	<i>Ownership Structure & Investor Rights</i>	<i>Financial Transparency</i>	<i>Board Process & Structure</i>	<i>Number of Companies</i>
U.K.	70	54	81	70	124
Rest of Europe	51	41	69	41	227
U.S.(Annual Report)	42	25	66	31	500
U.S. (All financial filings)	70	52	77	78	500
Japan	61	70	76	37	150
Asia-Pacific	48	41	60	42	99
Latin America	31	28	58	18	89
Emerging Asia	40	39	54	27	253

Note that there are two scores reported for the US companies, one based upon just the annual report (which is not very informative on a composite basis) and one based upon all financial filings with the SEC (which is much more informative). On a composite score basis, the UK and the US companies scored highest and Latin American companies scored the lowest.

In 2002, S&P also provided individual rankings for the firms in the S&P 500 on each of the dimensions, and concluded that while firms did a good job of disclosing financial information, they fell short in providing information on ownership structure, investor rights and board and management structure. The six items that they highlighted as lacking were as follows:

Management Review.

¹⁹ Patel, S.A. and G. Dallas, 2002, *Transparency and Disclosure: Overview and Methodology and Study Results – United States*, Standard and Poor's Publication.

- Any discussion of, or reference to, a corporate governance charter or code of best practices
- The text of a corporate governance charter or code of best practices
- A listing of the companies' top three shareholders
- The form in which directors' salaries are paid (cash, shares, etc.)
- The date on which each director joined the board
- The names of the directors on the nomination committee

It should be noted that the S&P composite score is as much a governance index as it is an information disclosure index, though the financial transparency component of the index is a more direct measure of information disclosure.

An Information Based Index

Neither the S&P index nor the Price Waterhouse Opacity index is designed to measure complexity from the perspective of someone doing valuation. One way to think about complexity is to begin with the inputs that go into the value of a company and consider all those factors that may make deriving those inputs more difficult in coming up a measure of complexity. For instance, one of the inputs you need to value a firm is risk. It is more difficult to estimate risk parameters for firms that are in multiple businesses than it is for firms that are in a single business for two reasons – different businesses can have different risk profiles and changes in the mix can change the overall firm's risk profile. It becomes even more difficult if the multi-business firm provides incomplete or misleading information on the profitability of each of its businesses.

Breaking down the valuation inputs into their main components, we can identify the factors that determine complexity: Table 4 represents an attempt (undoubtedly incomplete) to list out these factors. The contributions made by each of the factors to complexity vary, with some factors (such as volatile effective tax rates) being less important than others (substantial cross holdings in private companies). With the former, we always have the alternative of using the marginal tax rate as a substitute whereas there is no easy alternative measure for the latter. The weight attached to each factor will depend upon how much of the value is attributable to it, and whether it makes estimation more difficult or impossible. To illustrate, operating leases and R&D expenses

undoubtedly skew financial statements, resulting in misstated earnings and meaningless book values, but there is enough information usually available in financial statements for analysts to correct the problems. In contrast, we cannot easily adjust for extraordinary earnings that are not clearly identified as non-operating or one-time earnings.

Once we have identified the factors that determine complexity, and categorize them based upon their importance, we can construct complexity scores for firms. These complexity scores should allow us to distinguish between more complex and less complex firms, and to adjust value for complexity (if necessary). Appendix 2 contains one such attempt to come up with a complexity score.

Table 4: Complexity Factors and Valuation Inputs

Valuation Input	Complexity Factors	Reasons
Operating Income	<ol style="list-style-type: none"> 1. Multiple Businesses 2. One-time income and expenses 3. Income from unspecified sources 4. Items in income statement that are volatile 	<p>Makes it difficult to trace source of operating income</p> <p>Makes forecasting of future income difficult</p> <p>Makes forecasting of future income difficult</p> <p>Makes forecasting of future income difficult</p>
Tax Rate	<ol style="list-style-type: none"> 1. Income from multiple locales 2. Different tax and reporting books 3. Headquarters in tax havens 4. Volatile effective tax rate 	<p>Different tax rates in different locales</p> <p>Effective tax rate is meaningless</p> <p>Maneuvers to reduce taxes can lead to complexity</p> <p>Forecasting tax rate becomes difficult</p>
Capital Expenditures	<ol style="list-style-type: none"> 1. Volatile capital expenditures 2. Frequent and large acquisitions 3. Stock payment for acquisitions and investments 	<p>Forecasting becomes difficult</p> <p>Requires normalization over several years</p> <p>Difficult to figure out how much acquisitions cost</p>
Working capital	<ol style="list-style-type: none"> 1. Unspecified current assets and current liabilities 2. Volatile working capital items 	<p>Becomes repository for miscellaneous assets</p> <p>Forecasting working capital needs is difficult.</p>
Expected Growth rate	<ol style="list-style-type: none"> 1. Off-balance sheet assets and liabilities (operating leases and R&D) 2. History of stock buybacks 3. Restructuring charges 4. Acquisitions and Goodwill 4. Changing return on capital over time 	<p>Makes measuring capital invested difficult</p> <p>Pushes down book value of equity and increases returns</p> <p>Pushes down book value of equity and increases returns</p> <p>Measuring return on capital is difficult</p> <p>Makes forecasting returns more difficult</p>
Cost of capital	<ol style="list-style-type: none"> 1. Multiple businesses 2. Operations in emerging markets 3. No market traded debt 4. No bond rating 	<p>As business mix changes, the beta will change</p> <p>Different risk premiums for different markets</p> <p>You have to estimate market value of debt</p> <p>Estimating default spread becomes difficult</p>

	5. Off-balance sheet debt	Debt ratio difficult to estimate
Cross Holdings	1. Holdings in publicly traded firms 2. Holdings in private companies 3. Holdings in other entities	Requires that these companies be valued Impossible to get information on private company holdings Used to hide assets, debt and other unpleasant facts
Employee options	1. Options granted in the past 2. Continuing option grants	Insufficient information to value options Difficult to estimate expected earnings in future periods

Consequences of Complexity

When financial statements are not transparent, we cannot estimate the fundamental inputs that we need to examine to value a firm. For instance, a firm's expected growth should be a function of how much it reinvests (reinvestment rate) and how well it reinvests (its return on capital). If firms funnel their investments through holding companies that are hidden from investors, we cannot assess either of these inputs. To evaluate a firm's cost of capital, we need to know how much debt is owed by the firm, as well as the cost of this debt. For firms that hide a significant portion of their debt, we will underestimate the default risk that the firm is exposed to, and consequently, its cost of capital.

Does this mean that the value of a complex firm is more difficult to estimate than the value of a simple firm? The answer is yes, but it does not necessarily follow that investors will discount the value of complex firms because of this uncertainty. In fact, companies like General Electric, IBM and Tyco prospered in the 1990s, even as they became more complex. While some would argue that the increase in value came in spite of their complexity, there are others who would present the case that it was because of it. In this section, we consider some of the empirical evidence on the relationship between firm value and complexity.

The Cost of Opacity

In the last section, we referred to the opacity index developed by Price Waterhouse to measure the opacity of transparency of financial statements in 35 countries. In an interesting extension, Price Waterhouse also attempted to examine the impact of the opacity index on two variables that have direct consequences for value. The first was a "tax-equivalent" cost, where the opacity measure was converted into an equivalent tax rate. As they note in their report, an increase in the opacity index from the Singapore level (which is the most transparent) to the Chinese level is the equivalent of an increase in the tax rate of 46%. Table 5 summarizes their findings:

Table 5: Economic Cost of Opacity: "Tax-Equivalent" Estimates

<i>Country</i>	<i>O-Factor</i>	<i>Tax-equivalent (%)</i>
Argentina	61	25

Brazil	62	25
Chile	36	5
China	87	46
Colombia	60	25
Czech Republic	71	33
Ecuador	68	31
Egypt	58	23
Greece	57	22
Guatemala	65	28
Hong Kong	45	12
Hungary	50	17
India	64	28
Indonesia	75	37
Israel	53	19
Italy	48	15
Japan	60	25
Kenya	69	32
Lithuania	58	23
Mexico	48	15
Pakistan	62	26
Peru	58	23
Poland	64	28
Romania	71	34
Russia	84	43
Singapore	29	0*
South Africa	60	24
South Korea	73	35
Taiwan	61	25
Thailand	67	30
Turkey	74	36
United Kingdom	38	7
United States	36	5
Uruguay	53	19
Venezuela	63	27

In an alternate measure of the cost of complexity, Price Waterhouse measured the default spread on sovereign bonds issued by countries over the U.S. treasury and argued that this was a cost of complexity, since more complex companies tended to have much lower bond ratings. The Kurtzman Group quantifies the opacity effect as a premium or a discount, relative to doing business in the United States. In their 2004 survey, for instance, they conclude that the additional opacity of doing business in Indonesia would require an annual premium of 8.54%.

As further evidence that transparency does matter, Gelos and Wei (2003) note that

institutional investors invest less in companies that operate in less transparent countries and that they flee investments in these countries far more during crises.²⁰

The Conglomerate Discount

In the last two decades, evidence has steadily mounted that markets discount the value of conglomerates, relative to single-business (or pure play) firms. In a study in 1999, Villalonga compared the ratio of market value to replacement cost (Tobin's Q) for diversified firms and specialized firms and reported that the former traded at a discount of about 8% on the latter.²¹ Similar results were reported in earlier studies.²²

The reasons for the discount have been widely debated, with many attributing it to the lack of focus in these firms and the inefficiencies that follow. Another possible reason for the discount, though, may be the complexity that gets added to financial statements as firms enter multiple businesses. Even the best efforts of these firms to be more transparent often cannot overcome this problem. First, conglomerates inevitably consolidate costs for some functions – after all, one reason for creating conglomerates is to create economies of scale – and these consolidated costs then have to be allocated to the multiple divisions (businesses) that the firm is in. These allocations are subjective and investors may be dubious about the resulting bottom-line numbers. Second, the absence of market prices for the individual divisions makes it difficult for investors to see the value of each division and consider the market reactions to actions taken by that division.

How can we differentiate between discounts attributable to management inefficiencies and those caused by accounting complexity? We can look at market reactions to conglomerates that do break up to create independent entities run by

²⁰ R.G. Gelos and S. Wei, 2003, Transparency and International Investor Behavior, SSRN Working paper.

²¹ Villalonga, B., 1999, Does diversification cause the diversification discount?, Working paper, University of California, Los Angeles.

²² See Berger, Philip G., and Eli Ofek, 1995, Diversification's effect on firm value, *Journal of Financial Economics* 37, 39–65; Lang, Larry H.P., and René M. Stulz, 1994, Tobin's *q*, corporate diversification, and firm performance, *Journal of Political Economy* 102, 1248–1280; Wernerfelt, Birger and Cynthia A. Montgomery, 1988, Tobin's *q* and the importance of focus in firm performance, *American Economic Review*, 78: 246–250.

incumbent management. If the reason for the discount is accounting complexity alone, splitting the firm into independent businesses, with their own financial statements (and perhaps their own tracking stock) while preserving incumbent management control of the overall entity should eliminate the discount. If, on the other hand, it is management inefficiency that is the problem, we should expect to see the discount persist even after the split-up, since only divestitures will eliminate the underlying problem of poor management. The positive reactions associated with spin-offs, split-offs and divestitures can also be viewed as indirect evidence that market reward transparency. Linn and Rozeff (1984) examined the price reaction to announcements of divestitures by firms and reported an average excess return of 1.45% for 77 divestitures between 1977 and 1982.²³ They also noted an interesting contrast between firms that announce the sale price and motive for the divestiture at the time of the divestiture, and those that do not: in general, markets react much more positively to the first group than to the second, as shown in Table 6. The market clearly seems to be rewarding transparency at least about this specific action.

Table 6: Market Reaction to Divestiture Announcements

<i>Price Announced</i>	<i>Motive Announced</i>	
	Yes	No
Yes	3.92%	2.30%
No	0.70%	0.37%

Cost of Capital

If investors perceive firms that disclose less information to be more risky, it stands to reason that they will attach higher costs of capital and lower values to these firms. Diamond and Verrecchia (1991) use this rationale to argue that it is in the best interests of firms to disclose as much information as they can rather than hold back information.²⁴ In their model, firms that reveal more information to markets improve future liquidity and lower their costs of capital. In later papers, evidence is presented for the following phenomena:

²³ Linn, Scott C. and Michael S. Rozeff. *The Effect Of Voluntary Spin-Offs On Stock Prices: The Synergy Hypothesis*, Advances in Financial Planning and Forecasting, 1984, v1(1), 265-292.

²⁴ Diamond, D.W., and R.E. Verrecchia. 1991. Disclosure, liquidity and the cost of capital. *Journal of*

- More informative financial statements lead to lower bid-ask spreads for individual companies (thus adding to the liquidity argument).²⁵ Looking across markets, trading volume tends to be lower in markets with less information disclosure.
- Better disclosure reduces both the cost of equity²⁶ and the cost of debt²⁷ for firms, although the magnitude of the impact is debatable. The S&P study on transparency and disclosure referenced earlier also finds evidence, albeit weak, that companies with more transparent financial statements have lower costs of capital.
- Stocks in markets with poorer disclosure tend to move together far more, thus reducing the advantages to diversification and increasing exposure to market risk (and the risks of market crashes) across the board.²⁸

We would hasten to add that much of the evidence is ambiguous and the it is difficult to prove that better disclosure, by itself, is the cause for the lower cost of capital. After all, firms that disclose more information have other characteristics such as better corporate governance and operating performance that may also explain the lower costs of capital.

Market Reaction to Changing Disclosure Policy

The most direct test of whether markets value more information disclosure is to look at how markets react to changes in disclosure practice. These changes can either be

Finance 46 (4): 1325-1359.

²⁵ Welker, M. 1995. Disclosure policy, information asymmetry, and liquidity in equity markets, *Contemporary Accounting Research* 11(2): 801-827.

²⁶ Botosan, C.A. 1997. Disclosure level and the cost of equity capital. *The Accounting Review* 72 (3): 323-349.

²⁷ Sengupta, P. 1998. Corporate disclosure quality and the cost of debt. *The Accounting Review* 73(4): 459-474; Yu, F., 2003, Accounting Transparency and the Term Structure of Credit Spreads, Working Paper. The former presents evidence that the cost of debt is lower for firms with more transparent accounting statements whereas the latter shows that the effect is greater on short term debt than on long term debt.

²⁸ Jin, L. an S.C. Myers, 2005, R² around the world: New Theory and New Tests, SSRN Working Paper.

forced by regulatory shifts (from less disclosure to more disclosure) or voluntary, where a firm chooses to increase the amount of information it makes available to markets.

- Emerging markets that change their accounting standards to increase transparency usually report strong positive reactions to these changes, with investors being willing to pay more for stocks in these markets.
- When firms in emerging markets have depository receipts (ADR) listed on the U.S. market, their stock prices react positively. While there are a number of possible explanations for this phenomenon, one is that these firms often have to restate their financial statements using generally accepted accounting principles in the United States.

As with the other evidence presented on complexity, we are cautious in interpreting these results because there are other factors at play as well. For instance, emerging markets that change disclosure requirements also often change corporate governance practices at the same time, and companies that list ADRs also see a post-listing increase in liquidity.

Dealing with Complexity

Reviewing the last few sections, we can now state the three basic questions that we have to address in dealing with transparency in valuation:

- a. What do we use as a measure of complexity in valuation?
- b. Should we reflect this complexity in value?
- c. If we decide to incorporate complexity into value, how do we value complexity (or transparency)?

In prior sections, we have established that while measures of complexity exist, the ultimate test is a subjective one, and that the more complex a financial statement becomes, the more difficult it is to get basic information you need to complete a valuation. We have also shown some evidence, though none of it is conclusive, that complexity does affect value negatively. In this section, we begin by looking at why some or many analysts do not consider the complexity of firms when valuing them and why this may lead to biased valuations. We then consider ways of incorporating complexity into firm value.

A Case for ignoring Complexity

Conventional valuation models have generally ignored complexity on the simple premise that what we do not know about firms cannot hurt is in the aggregate because it can be diversified away. In other words, we trust the managers of the firm to tell us the truth what they earn, what they own and what they owe. Why would they do this? If managers are long-term investors in the company, it is argued, they would not risk their long term credibility and value for the sake of a short term price gain (obtained by providing misleading information). While there might be information that is not available to investors about these invisible assets, the risk should be diversifiable and thus should not have an effect on value.²⁹

This view of the world is not irrational but it does run into two fundamental problems. First, managers can take substantial short term profits by manipulating the numbers (and then exercising options and selling their stock) which may well overwhelm whatever concerns they have about long term value and credibility. Second, even managers who are concerned about long term value may delude themselves into believing their own forecasts, optimistic though they might be. It is not surprising, therefore, that firms become sloppy during periods of sustained economic growth. Secure in the notion that there will never be another recession (at least not in the near future), they adopt aggressive accounting practices that overstate earnings. Investors, lulled by the rewards that they generate by investing in stocks during these periods, accept these practices with few questions.

The downside of trusting managers is obvious. If managers are not trustworthy and firms manipulate earnings, investors who buy stock in complex companies are more likely to be confronted with negative surprises than positive ones. This is because managers who hide information deliberately from investors are more likely to hide bad

²⁹ This follows from the assumption that managers are being honest. If this is the case, the information that is not available to investors has an equal chance of being good news and bad news. Thus, for every complex company that uncovers information that reduces its value, there should be another complex company where the information that comes out will increase value. In a diversified portfolio, these effects should average out to zero.

news than good news. While these negative surprises can occur at any time, they are more likely to occur when overall economic growth slows (a recession!) and are often precipitated by a shock. In early 2002, the fall of Enron and the exposé of its accounting practices had a domino effect on the stock prices of Tyco, Williams Energy and even GE, all viewed as complex companies.³⁰

Ways of adjusting value for complexity

Can we value assets in complex companies while considering the potential for managers to mislead markets? In this section, we will present four practical ways in which we can adjust a discounted cash flow valuation for the complexity of financial statements. They are not necessarily mutually exclusive and represent solutions to different types of disclosure problems.

Adjust the cash flows

The simplest way to deal with complexity is to adjust the cashflows of firms for the complexity of their financial statements. In simple terms, we apply a discount to the expected cashflows, with the magnitude of the discount increasing for more complex companies. This process, called “haircutting the cashflows”, is very common both in capital budgeting and valuation, though the discounts applied tend to be both arbitrary and reflect factors other than complexity (such as risk).³¹ To make this a little more objective, we would suggest the following steps:

- a. Identify how much of the earnings of the firm come from assets that are invisible or not clearly identified. In particular, focus on earnings from holdings in

³⁰ The concerns about accounting practices were global. Post-Enron, European firms with opaque financial statements such as Siemens found themselves confronted with demands for more openness from their stockholders as did Asian companies like Samsung.

³¹ Adjusting cashflows for risk can be dangerous because of the double counting that can occur when discount rates are also adjusted for risk.

private businesses (or special purpose entities) as well as other non-operating income (such as income from pension funds and non-recurring transactions)

b. Assign a probability that management of the firm can be trusted with their forecasts. This is difficult to do, but it should reflect both objective and subjective factors. Among the objective factors is the history of the firm – past accounting restatements or errors will weigh against the management – and the quality of corporate governance – firms with strong and independent boards should be more likely to be telling the truth. The subjective factors come from our experiences with the management of the firm, though some managers can be likeable and persuasive, even when they are misrepresenting the facts.

In fact, the conversion of opacity into an implicit tax by Price Waterhouse represents a discounting of the cashflows. We could increase the tax rate for complex firms and estimate the cashflows for the firm with the higher tax rate. The lower expected cashflows will result in lower value. This approach is most appropriate when we are unsure about the current earnings of the firm (as stated in their financial statements) and feel that they might be overstated.

An alternative approach that may be simpler is to replace the inputs for the firm with more sustainable numbers. Thus, we would change the operating margin of the firm from its reported value to the industry average and the effective tax rate to the marginal tax rate. The management of the firm will complain mightily that we are being unfair in our valuation, but the onus should be on management to provide the information that allows us to believe that they can sustain higher margins and lower tax rates.

Adjust the Discount Rate

Earlier in this paper, we pointed to evidence that more complex companies tend to have higher costs of debt, equity and capital. Following up on this evidence, we can adjust the discount rate – the costs of equity and capital – that we use to discount the cash flows for complexity. In practical terms, we will increase the costs of equity and capital for firms with more complex financial statements, relative to firms with more transparent statements. There are three ways in which we can make this adjustment:

- a. Estimate the historical risk premium attached to complex firms by comparing the returns we would have made on a portfolio of complex firms historically to the returns we would have earned on a market index. For instance, if we would have earned 18.3% over the last 20 years investing in complex firms and only 14.1% investing in the S&P 500 index, the risk premium associated with complex firms is 4.2%. We can add this directly to the cost of equity of complex firms. The problems with this approach are two-fold. First, classifying firms into complex and simple firms is both difficult and subjective. Second, as firms change over time, we can have simple firms become complex (or vice versa), making it difficult to keep the portfolios intact.
- b. Adjust the betas of complex firms for the lack of the transparency. If we trust markets, it is possible that the betas of complex firms will be higher than the betas of simple firms.³² Going back to the bottom-up beta approach, this would add an additional step to the estimation process. After we estimate the bottom-up beta for a firm, based upon the business or businesses it is in, we would attach a complexity premium or a transparency discount to the beta, depending upon whether the firm we are analyzing is more complex or transparent than the firms in the sector.
- c. Relate the adjustment of the discount rate to a complexity score. In the earlier section, we presented the S&P disclosure score and an alternative complexity score based upon valuation inputs. It may be feasible to tie the adjustment to the discount rate to the complexity score. For instance, the S&P study concluded that the most complex firms in the S&P 500 (top 20%) had, on average, a 1% higher cost of capital than the most transparent firms (bottom 20%).
- d. If the complexity is not in the asset side of the balance sheet but on the liability side – significant off-balance sheet borrowing that is not footnoted or is referenced obliquely, for instance – we could adjust the debt to equity ratio to reflect the true leverage of the firm (including the off-balance sheet debt). This would result in a higher levered beta

³² This will occur only if there is a link between the negative returns associated with opacity and market returns. History suggests that there should be such a link. In fact, the problems with opaque companies seem to come to the surface in down markets and not bullish ones.

(and cost of equity) and a higher assessment of default risk (resulting in a higher cost of debt).

Adjusting the discount rate to reflect complexity makes the most sense for firms where the complexity is obscuring the riskiness of the businesses that the firm is involved in and/or the financial leverage of the firm.

Adjust Expected Growth / Length of the Growth Period

In valuing any firm, two key inputs that determine value are the length of the growth period and the expected growth rate during the period. More fundamentally, it is the assumptions about excess returns on new investments made by the firm during the period that drive value. What is the relationship between complexity and these inputs? Since we derive our estimates of return on capital and excess returns from existing financial statements, we would argue that it is more difficult to both estimate the return on capital at complex firms and to make judgments on whether these returns can be maintained. One way to adjust the value of complex companies then is to assume a lower return on capital on future investments and assume that these excess returns will fade much more quickly. In practical terms, the lower expected growth rate and shorter growth period that emerge will result in a lower value for the firm.

Apply a Complexity Discount

We could do a conventional valuation of a firm, using unadjusted cashflows, growth rates and discount rates, and then apply a discount to this value to reflect the complexity of its financial statements. But how would we quantify this complexity discount? There are several options:

1. One is to develop a rule of thumb, similar to those used by analysts who value private companies to estimate the effect of illiquidity. The problem with these rules of thumb is that they are not only arbitrary but that the same discount is applied to all complex firms.
2. A slightly more sophisticated option is to use a complexity scoring system, similar the one described in appendix 2 to measure the complexity of a firm's financial statements and to relate the complexity score to the size of the discount.

3. We could compare the valuations of complex firms to the valuation of simple firms in the same business, and estimate the discount being applied by markets for complexity. Since it is difficult to find otherwise similar firms, we can estimate this discount by looking at a large sample of traded firms and relating a standard multiple of value (say price to book ratios) to financial fundamentals (such as risk, growth and cashflows) and some measure of complexity (such as the complexity score). We did this on a limited basis for the hundred largest market capitalization firms and related price earnings ratios to expected growth rates, betas, payout ratios and number of pages in the 10K for each of these firms (as a measure of complexity). The regression is summarized below:

$$PBV = 0.65 + 15.31 \text{ ROE} - 0.55 \text{ Beta} + 3.04 \text{ Expected growth rate} - 0.003 \# \text{ Pages in 10K}$$

Thus, a firm with a 15% return on equity, a beta of 1.15, and expected growth rate of 10% and 350 pages in the 10K would have a price to book ratio of

$$PBV = 0.65 + 15.31 (.15) - 0.55 (1.20) + 3.04 (.10) - .003 (350) = 1.54$$

Relative Valuation

Most analysts value companies using multiples and comparable firms. How can this approach be modified to consider firms that are complex? While it is more difficult to assess the effect of complexity on relative value, we should consider the following options:

- a. If a firm is in multiple businesses, we could value each business using a separate relative valuation and different comparable firms, rather than trying to attach one multiple to the entire company. If the firm reports revenues or earnings from unspecified businesses (where information is not provided or is withheld), our estimate of relative value for these businesses should be conservative. For instance, we could treat these earnings as both risky and low growth and apply a low multiple to estimate value.
- b. As in the case of discounted cashflow valuation, we could do a conventional relative valuation (with no adjustment for complexity) and then discount the

relative value for the complexity of the firm. The adjustment process would mirror that used for the discounted cashflow value.

As firms become more complex, relative valuation becomes much more difficult across the board since we need comparable firms with market prices to estimate the appropriate multiples. After all, what firm is truly comparable to GE or Citigroup?

Cures for Complexity

To preserve the integrity of financial markets, we must push to make the financial statements of firms both truthful and transparent. In this section, we will consider some of the ways in which we can make this a reality.

Legislation

In the aftermath of accounting scandals in the United States, legislation has inevitably followed. After the great depression and evidence of financial skullduggery, the Glass-Steagall Act was passed, restricting banks from investment activity, and the Securities Exchange Commission was created to regulate the trading of securities. In the aftermath of the collapse of the savings and loans in the 1980s, we saw increased regulation of financial service firms in general. The latest crisis in accounting, precipitated by the implosion of Enron, has resulted in new laws designed to prevent a recurrence.

While the motivation for legislation is usually noble, laws are blunt instruments that often create new problems in the process of solving old ones. Restrictions on the granting of options to employees may prevent their abuse in compensation systems but they also undercut attempts to make managers have a stake in the company's success in financial markets. Restrictions on special purpose entities may take away legitimate avenues for firms to reduce their cost of borrowing.

Auditing and Accounting Integrity

Accounting standards and rules are usually rewritten in response to corporate failures. No matter how strict accounting standards are, financial statements will be reflections of a firm's true standing only if accounting principles are strictly adhered to

and auditors monitor this adherence. There are three things that we can do to do to make this happen:

- a. Conflicts of interest created when auditors receive income for other services provided to the firm (consulting, for instance) undercut their objectivity. Consequently, auditing firms should either spin off or divest their consulting arms. If they choose not to do so, firms should not use the same accounting firm for both auditing and consulting services.³³
- b. Accounting rules should be streamlined and discretionary choices should be reduced. In other words, we should have fewer and clearer rules, resulting in less voluminous but more informative financial filings. While this may seem to reduce disclosure, it will increase relevant disclosure and eliminate the fog created by the disclosure of minor facts.
- c. Firms should not be allowed to maintain different books for tax and reporting purposes. The different rules followed in the two sets of books for depreciation, inventory valuation and expensing adds to the complexity of the statements and make it more difficult to value firms.
- d. Firms in multiple businesses should be required to report the reinvestment - – capital expenditures, depreciation and working capital - they made in each business each year, in addition to what is already reported (revenues and operating income). Some firms already do this voluntarily but all firms should provide this information.
- e. Firms with capital arms – GE and the automobile companies come to mind – should be required to have a separate and full financial statements for these divisions. The intermingling of what is essentially a financial service firm (GE Capital, Ford Capital) with a conventional manufacturing or service firm makes it very difficult to value these firms.³⁴

³³ It is a little unfair to pick on accountants alone in this regard. Investment bankers who design the special purpose entities for firms have their own conflicts of interest that skew the advice they offer to corporations.

³⁴ As a very simple example of the confusion created by the mixing of capital and manufacturing divisions, the debt reported by these companies is often large (reflecting the debt of the capital arm).

Skeptical Analysts and proactive investors

Equity research analysts have always been cautious about downgrading firms that they follow³⁵ and they have become far too accepting of management claims and promises in the last decade. The rising stock market during the 1990s explains part of the reticence to ask questions but the other reason is the overlap between investment banking and equity research. Analysts have had to worry more and more about the consequences of downgrades and sell recommendations on investment banking revenues, and thus have become cheerleaders for firms rather than questioning analysts.

It is the responsibility of analysts to demand information that they feel is critical in assessing the value of the firms they follow. For instance, analysts following a firm with substantial cross holdings are right to demand enough information about these cross holdings to value them. If the information is not forthcoming, they have to be willing to highlight this failure and use it as a justification for downgrading the firm. Clearly, if enough analysts demanded the information, the firm would find a way to provide it or risk serious punishment in the market.³⁶

As investors, it is easy to blame loose laws, incompetent auditors and snoozing analysts for complex companies that turn into investment disasters. However, we should recognize that we bear a substantial responsibility for our failures, since we do not have to buy stocks that analysts recommend. If, as investors, we refused to buy stock in companies with complex financial statements (hence discounting value for complexity), we are providing the ultimate incentive for firms to eliminate or at least reduce complexity.

Stronger Corporate Governance

³⁵ Note that this is a far weaker test than issuing sell recommendations. Analysts are reluctant to lower firms from a strong buy to a weak buy.

³⁶ Chang, J.J., T. Khanna and K. Palepu, 2003, *Analyst Activity around the World*, Harvard Business School Working Paper. They find that analyst activity contributes to making financial statements more transparent, even in complex firms.

The key lesson of the Enron debacle should be that a strong and independent board is the best defense against firms manipulating earnings and hiding relevant facts from the market. It should force institutional investors who have been on the sidelines of this debate to be much more activist and push for changes in corporate governance. In particular, they should push for smaller boards with more outside directors, selected not by the CEO but by an independent group representing stockholders. The number of directorships that an individual can hold should be restricted and directors should have no other business relationship to the firm. Finally, audit committees should include members with enough accounting expertise to ask tough questions about the firm's accounting choices.³⁷

The issue of executive compensation has to be examined in conjunction with corporate governance. A significant factor behind complexity remains the incentives of managers to cook the books in the short term, leaving others to clean up the mess in the long term. We continue to believe that providing managers with equity stakes in the firms they manage plays an important role in reducing the conflicts between managers and stockholders, but the granting of executive options to accomplish this has created significant side costs.

Conclusion

Are complex firms worth less than otherwise similar simple firms? In some cases, they are and we have examined both the sources of complexity in financial statements and the appropriate responses in valuation. Complexity is the result of business decisions made by the firm (you can diversify and make your business mix more complex), structuring decisions on how the firm is organized (holding structures and consolidation) and disclosure decisions (on how to reveal information to financial markets). Thus, firms can have complex financial statements even if they are in simple businesses because of

³⁷ A.J. Felo, S. Krishnamurthy and S.A. Solieri, 2003, Audit Committee Characteristics and the Perceived Quality of Financial Reporting: An Empirical Analysis, SSRN Working Paper. They find that audit committees with a higher percentage of members with accounting expertise improve the quality of financial reports.

accounting decisions they make. We developed a number of potential measures of complexity, ranging from a measure of opacity (developed by Price Waterhouse) to our complexity score (developed by asking a series of questions about companies).

If we trust managers to be unbiased in what information they reveal to markets and when they reveal this information, we could argue that complexity by itself is not a problem since the additional uncertainty created is essentially firm-specific and diversifiable. If, on the other hand, managers are more likely to use complexity to hide unpleasant or bad news (losses or debt), complexity will result in more negative surprises than positive ones. In this case, it is appropriate to discount value for complexity. The discounting can occur in one of the inputs to a discounted cashflow value – cashflows, growth rates or discount rates – or can take the form of a complexity discount on conventional (unadjusted) value.

It is quite clear that firms should avoid unnecessary complexity but the way to ensure this is often not new legislation or more accounting rules, since they have unintended side consequences. Instead, investors and analysts need to become more demanding of firms. If we consistently discounted the value of complex firms, we will create an incentive for simpler holding structures and more transparent financial statements.

Appendix 1: S&P's Transparency and Disclosure Index: Key Questions

Ownership Structure and Investor Rights

Transparency of ownership

- Provide a description of share classes?
- Provide a review of shareholders by type?
- Provide the number of issued and authorized but non-issued ordinary shares? (2)
- Provide the par value of issued and authorized but non-issued ordinary shares? (2)
- Provide the number of issued and authorized but non-issued shares of preferred, nonvoting, and other classes? (2)
- Provide the par value of issued and authorized but non-issued shares of preferred, non-voting, and other classes? (2)
- Does the company disclose the voting rights for each class of shares?

Concentration of ownership

- Top 1, 3, 5, or 10 shareholders disclosed? (4)
- Shareholders owning more than 10, 5, or 3 percent is disclosed? (3)
- Does the company disclose percentage of cross-ownership?

Voting and shareholder meeting procedures

- Is there a calendar of important shareholder dates?
- Review of shareholder meetings (could be minutes)?
- Describe procedure for proposals at shareholder meetings?
- How shareholders convene an extraordinary general meeting?
- How shareholders nominate directors to board?
- Describe the process of putting inquiry to board?
- Does the annual report refer to or publish Corporate Governance Charter or Code of Best Practice? (2)
- Are the Articles of Association or Charter Articles of Incorporation published?

Financial Transparency and Information Disclosure

Business focus

- Is there a discussion of corporate strategy?
- Report details of the kind of business it is in?
- Does the company give an overview of trends in its industry?
- Report details of the products or services produced/provided?
- Provide a segment analysis, broken down by business line?
- Does the company disclose its market share for any or all of its businesses?
- Does the company report basic earnings forecast of any kind? In detail? (2)
- Disclose output in physical terms?
- Does the company give an output forecast of any kind?
- Does the company give characteristics of assets employed?
- Does the company provide efficiency indicators (ROA, ROE, etc.)?
- Does the company provide any industry-specific ratios?
- Does the company disclose its plans for investment in the coming years?
- Does the company disclose details of its investment plans in the coming years?

Accounting policy review

- Provide financial information on a quarterly basis?
 - Does the company discuss its accounting policy?
 - Does the company disclose accounting standards it uses for its accounts?
- Does the company provide accounts according to the local accounting standards?
- Does the company provide accounts in alternate internationally recognized accounting method? Does the company provide each of the balance sheet, income statement, and cash-flow statement by internationally recognized methods? (4)
 - Does the company provide a reconciliation of its domestic accounts to internationally recognized methods?

Accounting policy details

- Does the company disclose methods of asset valuation?
- Does the company disclose information on method of fixed assets depreciation?

- Does the company produce consolidated financial statements?

Related party structure and transactions

- Provide a list of affiliates in which it holds a minority stake?
- Does the company disclose the ownership structure of affiliates?
- Is there a list/register of related party transactions?
- Is there a list/register of group transactions?

Information on auditors

- Does the company disclose the name of its auditing firm?
- Does the company reproduce the auditors' report?
- Disclose how much it pays in audit fees to the auditor?
- Disclose any non-audit fees paid to auditor?

Board Structure and Process

Board structure and composition

- Is there a chairman listed?
- Detail about the chairman (other than name/title)?
- Is there a list of board members (names)?
- Are there details about directors (other than name/title)?
- Details about current employment/position of directors provided?
- Are details about previous employment/positions provided?
- Disclose when each of the directors joined the board?
- Classifies directors as an executive or an outside director?

Role of the Board

- Details about role of the board of directors at the company?
- Is there disclosed a list of matters reserved for the board?
- Is there a list of board committees?
- Review last board meeting (could be minutes)?
- Is there an audit committee?
- Disclosure of names on audit committee?
- Is there a remuneration/compensation committee?
- Names on remuneration/compensation committee)?
- Is there a nomination committee?
- Disclosure of names on nomination committee?
- Other internal audit function besides audit committee?
- Is there a strategy/investment/finance committee?

Director training and compensation

- Disclose whether they provide director training?
- Disclose the number of shares in the company held by directors?
- Discuss decision-making process of directors' pay?
- Are specifics of directors' salaries disclosed (numbers)?
- Form of directors' salaries disclosed (cash, shares, etc.)?
- Specifics disclosed on performance-related pay for directors?

Executive compensation and evaluation

- List of the senior managers (not on the board of directors)?
- Backgrounds of senior managers disclosed?
- Number of shares held by the senior managers disclosed?
- Disclose the number of shares held in other affiliated companies by managers?
- Discuss the decision-making of managers' (not board) pay?
- Numbers of managers' (not on board) salaries disclosed?
- Form of managers' (not on board) salaries disclosed?
- Specifics disclosed on performance-related pay for managers?
- Details of the CEO's contract disclosed?

Appendix 16.2: Measuring Complexity with a Score – An Example

Item	Factors	Follow-up Question	Answer	Weighting factor	Complexity score
Operating Income	1. Multiple Businesses	Number of businesses (with more than 10% of revenues) =	2	2.00	4
	2. One-time income and expenses	Percent of operating income =	20%	10.00	2
	3. Income from unspecified sources	Percent of operating income =	15%	10.00	1.5
	4. Items in income statement that are volatile	Percent of operating income =	5%	5.00	0.25
Tax Rate	1. Income from multiple locales	Percent of revenues from non-domestic locales =	100%	3.00	3
	2. Different tax and reporting books	Yes or No	Yes	Yes=3	3
	3. Headquarters in tax havens	Yes or No	Yes	Yes=3	3
	4. Volatile effective tax rate	Yes or No	Yes	Yes=2	2
Capital Expenditures	1. Volatile capital expenditures	Yes or No	Yes	Yes=2	2
	2. Frequent and large acquisitions	Yes or No	Yes	Yes=4	4
	3. Stock payment for acquisitions and investments	Yes or No	Yes	Yes=4	4
Working capital	1. Unspecified current assets and current liabilities	Yes or No	Yes	Yes=3	3
	2. Volatile working capital items	Yes or No	Yes	Yes=2	2

Expected Growth rate	1. Off-balance sheet assets and liabilities (operating leases and R&D)	Yes or No	Yes	Yes=3	3
	2. Substantial stock buybacks	Yes or No	Yes	Yes=3	3
	3. Changing return on capital over time	Is your return on capital volatile?	Yes	Yes=5	5
	4. Unsustainably high return	Is your firm's ROC much higher than industry average?	Yes	Yes=5	5
Cost of capital	1. Multiple businesses	Number of businesses (more than 10% of revenues) =	2	1.00	2
	2. Operations in emerging markets	Percent of revenues=	30%	5.00	1.5
	3. Is the debt market traded?	Yes or No	Yes	No=2	0
	4. Does the company have a rating?	Yes or No	Yes	No=2	0
	5. Does the company have off-balance sheet debt?	Yes or No	No	Yes=5	0
		Complexity Score =			53.25