Contract Theoretic Analysis of Off–Balance Sheet Financing

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I. Introduction

This paper analyzes the reporting problems associated with off–balance sheet financing (OBSF) and explores possible resolutions to the controversy that surrounds OBSF and accounting for new types of financial instruments. In the Sections II through IV, we analyze three general issues of financial reporting that are central to an understanding of the disagreements surrounding OBSF: (1) the effect of different perspectives (representational faithfulness, decision usefulness, and contract enforcement or accountability) on financial reporting practices; (2) the duality of stocks and flows, and the attendant problems of classifying contracts for the purpose of financial reporting; and (3) the problem of reporting on statistically or contractually correlated resource flows. After addressing these three theoretical issues, we turn in Section V to examining a common form of off balance sheet financing. We conclude that formulation of intertemporally stable financial reporting standards would be facilitated if (1) contract enforcement considerations were added to the representational faithfulness and decision usefulness perspectives currently used by the Financial Accounting Standards Board (FASB), and (2) the range of financial reporting alternatives considered by the Board were expanded to include expected value reporting on one hand and reporting of contract sets on the other.

II. Financial Reporting Perspectives

Financial reporting practices can be examined from at least three different perspectives: representational faithfulness (RF), decision usefulness (DU), and contract enforcement or accountability. This section reviews the RF and DU viewpoints and provides a more extended treatment of the contracting perspective.

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Representational Faithfulness

From the representational faithfulness perspective (FASB [1980], paras. 63–71), the firm is seen as a collection of economic facts; accounting methods are evaluated by their ability to produce numbers and disclosures that approximate these facts as closely as possible. Although alternative formulations of RF are possible, the FASB has interpreted it as a rule of similarity, requiring that a complex accounting event be treated as equivalent to the one simpler event to which it is deemed to have the most in common. As such, some attributes are relied on for the purpose of choosing accounting treatments, and others are suppressed. For example, the equity component of convertible debt can vary from near zero to near one. Yet the accounting treatment of these securities depends on their debt attributes alone. In the presence of uncertainty, the RF criterion, unless further specified, provides little help on selecting a desirable representation of the relevant probability distributions for uncertain cash flows.

Decision Usefulness

The decision usefulness criterion was developed to deal with accounting under uncertainty using statistical decision theory (Churchman and Ackoff [1955]; Davidson and Trueblood [1961]; Demski [1980]; and Demski and Feltham [1976]). Decision usefulness (DU) analysis of accounting examines the value of accounting data, specified by its statistical properties, in assisting investors and managers to make better choices under uncertainty. By attributing a preference function to the decision maker, it is possible to evaluate the degree to which different accounting representations assist the decision maker in arriving at the best feasible outcome. Using the DU criterion permits accountants to assess whether the cost of obtaining and interpreting financial data can be justified by a greater benefit to the decision maker.

The FASB has considered the decision usefulness of accounting information (FASB [1978]) and discussed the trade-off between costs and benefits (FASB [1980], paras. 133–144). However, these statements ignore the fact that many proponents of the DU perspective reject the possibility of rigorously determining the greatest good for the greatest number in setting accounting standards or in any other object of social choice.[1]

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1. For example, Demski (1974) stated: "[W]e know that no robust concept of optimality exists, unless we admit to a dictatorial imposition" (p. 232).

Contract Enforcement

Under the contract enforcement perspective on accounting, a firm can be seen as a set of contracts among economic agents. Each economic agent—including employees, managers, investors, customers, vendors, government, creditors, and auditors, depending on the context of analysis—is expected to contribute resources and expects to receive resources in exchange. Agents are motivated by their respective preferences for effort, resources, consumption, or other specified factors. Accounting and control system helps implement and enforce the contract set.[2]

Implementation and enforcement of contract sets are complicated by two considerations. First, the contract set is not complete. A complete contract set would specify the rights and obligations of each agent under all contingencies. Even for a simple organization, specifying a complete set of contracts would be a formidable task, considering the large number of possible events on which such relationships may depend. Incomplete contracts necessarily depend on the expectations of participants about what might happen under various contingencies, both anticipated and unanticipated. Successful implementation of contract sets requires that the expectations of the participants are kept sufficiently aligned with one another to minimize the chances of surprise or disappointment and consequent disintegration of the set.

Second, resources vary in the degree to which their stocks and flows can be measured, monitored, or even identified. Measurability of resource contributions and claims of various agents must be reckoned in designing an enforceable contract set. Accounting systems serve these functions—measuring resources and communicating information among the participating agents to minimize the likelihood of too great a divergence between their resource expectations and actual realizations.

When outcomes that are not specifically provided for in the contract set occur, it is useful to have resource allocation devices that will help maintain the stability of the contract set. The participating agents must believe that the *ex post* choice of resource allocation under such circumstances is proximate to what have been agreed on, if considered, *ex ante*. Otherwise the contracting set will be destabilized and may disintegrate in mutual recrimination and distrust. However, this flexibility in the contract set also provides opportunities for various agents, especially the managers who operate the contract set of the firm, to exploit the system to serve their own

2. See Ijiri (1975, Chap. 3) on accountability relation and Sunder (1987) on contract enforcement.

ends. In this respect the output of the accounting system is comparable to a public good: Every agent prefers that all other agents cooperate in minimizing the divergence in expectations, while he or she attempts to obtain a maximum allocation of resources for himself or herself. If every agent acted in such a noncooperative fashion, firms would not exist and all participants would be worse off.

The Hierarchy of Perspectives

The degree of representational faithfulness of accounting numbers is an important attribute of accounting information from the DU perspective. In turn, the optimum choice under the DU criterion constitutes steps in the contractual process among agents. These three approaches to accounting can be treated as a hierarchy in which standards development and application can be viewed alternately as a puzzle with an indeterminate solution (representational faithfulness), a game against nature (decision theory), or a game among agents (contract theory). The contracting perspective assumes that solutions to accounting problems will draw on elements from all three levels of this hierarchy.

Both the representational faithfulness and the decision usefulness criteria ignore the action-reaction sequence that occurs between accounting on the one hand and decision making on the other. When decision makers take GAAP as a given, it is often possible for them to act to take advantage of acceptable reporting methods and to make accounting choices that cast their actions in the best possible light. Such motives underlie the design of many new financial instruments and many applications of reporting standards to such instruments and transactions by extension or analogy. Accountants react to such decisions by modifying the accounting standards, or reinterpreting the standards in relationship to newer types of transactions or instruments, and thus present new opportunities for decision makers to modify their behavior. Off—balance sheet financing and financial instruments are prominent, but by no means unique, examples of this action-reaction sequence.

By assuming stationary stochastic processes rather than system evolution, the RF and DU perspectives fail to yield clues about the nature of changes in reporting equilibria. The accountability (or contract theoretic) perspective, on the other hand, approaches the analysis of accounting methods from a systemic perspective: It takes into account the response of all specified agents to the accounting system. Decisions made by various agents are affected by the statistical properties of information available to them, and these decisions in turn affect decisions of others. The questions we must

address under this perspective include not only the uncertainty of the accounting environment, and the decision usefulness of data, but also the interaction among decision makers. The contract theoretic perspective may yield accounting methods that are poor in faithfully representing any given parameter of the environment. These methods may even be dominated by other methods that provide information that is statistically more useful for some or every class of decision maker, if considered individually. However, when we consider the ability of various accounting methods to facilitate the execution of contracts among a set of individuals with diverse interests, it may be the case that the best solutions deviate from the solutions generated by the RF and DU criteria.

Having considered the different reporting perspectives, we turn to the second of the issues considered in this paper, the duality of stocks and flows. Although the issue is an old one, we believe the contracting perspective successfully rationalizes existing practices that appear contradictory from the RF viewpoint. This rationale can be extended to yield some insights into the OBSF problem.

III. The Duality of Stocks and Flows and Classification of Contracts

Contracts that constitute a firm specify conditions under which resources are exchanged. It is possible to represent each resource in the form of either a stock or a flow variable. Every stream of flows can be capitalized to its corresponding stock representation through the process of discounting or accumulation; and every stock of resources can be converted into a variety of flow representations. This duality of representation is a fundamental characteristic of all resources.

For some resources (e.g., special-purpose machinery), it is possible to measure the stock with greater accuracy or smaller cost than the corresponding flow, and, therefore, we represent them in terms of stock variables. For other resources (e.g., taxi rides, movie tickets), flow variable representation is more precise or easier to obtain. Sometimes both stock and flow representations are accessible (e.g., rental apartments); and, finally, there are resources for which neither representation is credible (e.g., underground oil reserves, customer goodwill).

Resources for which stock representation is convenient are often said to be "owned" by the firm. The label of ownership is only a shorthand expression for two attributes: The specified agent has certain contractual rights to some resources, and these resources have a convenient stock representation. Besides being a label for these attributes, ownership itself has

no other implications about the characteristic of resources. Because rights to resources are always contingent on fulfillment of certain conditions, there is no such thing as outright ownership of a resource. The "ownership" of my house, car, and clothes, for example, is simply an expression of certain rights I can expect to enjoy provided that I comply with the mortgage contract with my banker, rules of traffic, and conditions of decency expected by my neighbors.

Given this tentative nature of "ownership," whether or not a resource is recognized in financial statements cannot be determined by asking the question: Does the firm own the resource? To do so would be to beg the question.

Under our current system of financial reporting, articulation between stocks on the balance sheet and flows on the statements of income and changes in cash flow is both incomplete and imperfect; the unavoidable lapses in articulation are critical to understanding the OBSF problem. If we did not require articulation of financial statements, the balance sheet would consist of stock representations of rights and obligations pertaining to resources that can be accurately, conveniently, and promptly measured. Similarly, the income statement would incorporate those resource flows that can be easily and reliably measured. There is no guarantee that the sets of resources whose stocks and flows can be so measured would be identical. In fact, the decades of debate over deferred taxes, replacement cost depreciation, and the income effects of foreign subsidiary translation suggest that we can expect little agreement as to a set of resources whose stocks and flows can readily be represented on financial statements.

Under extant accounting practice, not all resources are recognized as either stocks or flows. Further, some resources are measured as stocks without corresponding flows (e.g., land and pre-1970 goodwill), whereas some flows are measured without related stocks (e.g., research and development outlays and nonfactory wages). Additionally, we attempt to maintain the semblance of articulation by constructing the flow (stock) equivalents of measurable stock (flow) variables (e.g., depreciation of long-term assets in the income statement and capitalization of leases and prepaid costs on the balance sheet). How to construct correspondent variables, and under what conditions it is appropriate to abandon the task of articulation, are questions that lie at the heart of major problems in standardizing accounting practice including OBSF.

In current financial reporting practice, resources included in the financial statements must meet a judgmental threshold of measurability in either their stock or their flow representation. Once a resource enters the balance sheet or the income statement, we try to create a correspondent variable for the other statement through capitalization or amortization. Again, construction

of such correspondent variables (e.g., capitalized leases, depreciation) requires that they also meet a judgmental threshold, albeit a lower one, of measurability. In its various pronouncements, the FASB has attempted to use these judgmental thresholds of uncertainty that must exist for application of various accounting treatments. Judgmental thresholds create discontinuities and offer incentives for managers either to alter their judgments about the uncertainty associated with the resource measurement or to redesign contracts to cross the judgmental threshold in the desired direction. For example, a lessor who wishes to recognize the transaction as a sale may understate the risk of default by the lessee. Similarly, a lessee who does not wish to have a liability for lease obligations appear on the balance sheet may adjust the estimated useful life of the leased asset in order to ensure that the lease term is less than the 75 percent threshold. Such efforts to redesign contracts are unlikely to be mitigated by rule makers through adjustments in judgmental thresholds.

We can see two different possibilities for dealing with this problem. Abandonment of articulation between stock and flow statements will solve only the part of the problem that concerns the choice of correspondent variables that depend on judgments about the degree of uncertainty. Moreover, articulation of stock and flow statements is too deeply embedded in the system of double entry bookkeeping to easily be given up now. It may also create more problems than it solves by reducing constraints on managerial behavior.

A second, and more promising, possibility is to abandon the judgmental threshold approach to reporting uncertain events and move toward reporting statistical constructs such as expected values, variances, and correlations. The judgmental threshold approach results in all-or-nothing; the statistical approach will eliminate this discontinuity because small changes in the judgments about uncertainty of a resource flow will result in only small changes in the expected value of the resource. The statistical approach will therefore remove the large incentives that now exist for making even small changes in judgmental uncertainties. On the other hand, a disadvantage of the statistical approach would be that probabilistic judgments will affect *all* resources reported in the financial statements. We return to a discussion of this question in the context of the problem of reporting on correlated resource flows.

IV. Statistical Representation of Correlated Cash Flows

The firm consists of contracts that are interrelated in complex ways. The accounting process deliberately decomposes the complex web of contracts by separately defining small clusters of resource rights and obligations

into discrete events. These events are then treated as though they were independent of all others. Complete independence is rarely obtained, but in most cases dependence is sufficiently weak to be ignored for the sake of developing a simple and feasible system of reporting. The problem of accounting for correlated resource flows and of deciding when their collinearity should be recognized in the accounting system is the third basic issue that lies at the root of OBSF.

OBSF as well as defeasance issues can be restated in statistical terms as problems that arise from negative correlation among streams of resources. If correlations were perfect (i.e., if there were no uncertainty), it would be easy to justify OBSF or defeasance.[3] This extreme condition is fulfilled in few cases. The case of zero correlation between resource flows is also easy to handle—record each stream of cash flows separately. How can or should the accountant handle the vast number of cases in which resource streams are significantly but less than perfectly correlated?

In the point-estimation system of financial reporting currently in use, correlation of resource streams may appear to be irrelevant. Since the expected value of the sum or the difference of any two random variables is equal to the sum or difference of their expected values, independent of their correlation, a concern with correlations may appear to be misplaced. Lenders and shareholders, however, are concerned not only with the expected value, but also with the risk of their investments. Since the variance of the sum of random variables depends on their correlation, they play a crucial role in defining the riskiness of investments.

Consider two incremental cash flows represented by random variables x and y. Suppose a firm has existing cash flow z and must decide how to account for these two incremental flows. If x and y have equal expected values and variances and are perfectly negatively correlated, they will cancel each other out under every possible circumstance. Under such conditions, nothing would be gained by supplementing reports of z by reports of x and y. This condition provides the conceptual basis for nonrecognition or defeasance of assets and liabilities. At the other extreme, if x and y had perfect positive correlation, they could be usefully aggregated into one item for the purpose of reporting. Finally, cash flows that are uncorrelated could appear as separate line items in the financial reports. It is possible to create a statistical rationale for such a practice. For example, let us assume that, in the absence of any other information, the readers of financial statements treat the cash flows from each line item in financial statements as essentially independent of one another. The extent of under- or overestimation of the

3. In this instance, perfect correlation is perfectly negative.

variance of the sum of the cash flows would be minimized by aggregating cash flows that are highly correlated with one another. Aggregation of positively correlated cash flows will amount to adding them together; aggregation of highly negatively correlated cash flows amounts to netting them out against each other and thus taking them off the balance sheet. The cut-off point for the absolute value of correlation beyond which the items are aggregated could be determined by an appropriately chosen objective function.

The use of classified financial statements provides an approximate solution to the problem of relating cash flows with nonzero correlations. We reinterpret the traditional categories, such as current versus noncurrent assets or selling versus administrative expenses, as qualitative approximations of factors or principal components. Items within a single category presumably would load highest on the same factor. Extending the analogy, ratio analysis can be seen as a search for simple structure, in which moderately correlated resources such as cash, receivables, and inventory are added to form a single numerator. However, the utility of such aggregations is limited since they fail to distinguish common from account-specific variance.

In this section we have examined financial statement recognition and classification from the point of view of correlation between resource flows. From this viewpoint, the joint recognition/classification decision communicates to statement users the expected variance of the resource flows of the firm. Aggregating independent flows and separately reporting highly positively or negatively correlated flows results in a divergence between the expected variance of resources allocated to agents and the actual variance of their realized returns. As discussed in Section II, differences between expectations and realizations attributable to measurement error can destabilize the contract set and may lead to its disintegration.

V. Accounting for Leases

We now apply the insights obtained from the discussion of reporting perspectives, duality of resources, and correlation of resource flows to examine the development and evolution of a perennial OBSF issue—lease accounting. The leasing problem is usually framed as a dichotomous choice between classification of the transaction as a short-term rental or as the purchase of a capital asset. In the RF perspective, choice between these options must be made on the basis of whether the measured stocks and flows of resources correspond closely to the actual quantities. The DU approach considers this choice to be important to the extent specific economic decisions may be influenced by the capitalization/expense decision. From the

contracting perspective, the basic issue is the effect of the capitalization/expense decision on the behavior of various agents, including any action-reaction sequences that are likely to arise and any consequential effects on allocation of the firm's resources.

The Committee on Accounting Procedure was the first authoritative body to consider the issue of the accounting treatment for lease contracts that were installment purchases in all material respects (AICPA [1949]). Transfer of ownership at the end of the lease term and the existence of bargain purchase options were identified by the Committee as conditions that create a presumption of purchase equivalence. The cash flows associated with these leased assets were perfectly positively correlated with traditionally acquired fixed assets; the related obligations were equally well correlated with the corresponding long-term debt. Since the RF perspective treats transactions as being either perfectly correlated with, or else completely independent of, all other transactions, it provided adequate guidance for classifying such leases.

As the leasing industry evolved, contracts containing increasingly complex rules for determining resource inputs and allocations proliferated. To some degree this evolution reflected an action-reaction sequence in which managers sought the most advantageous (to them) contracts obtainable under the prevailing accounting rules. Standardized lease contracts were replaced by leases that were increasingly tailored to the unique needs of individual lessors and lessees. As lease contracts proliferated to populate the continuum from full to minimal transfer of property rights, the RF perspective no longer yielded a categorization that captured the differences in statistical correlation between financial leases and purchases. Economic agents (particularly debtors and shareholders) could no longer form reasonably precise expectations as to the expected variance of resource flows. This diffusion of expectations represents a disintegrative force promoting hostile gaming among economic agents.

The DU perspective provided the rationale for the increasingly complex leasing standards issued by the Accounting Principles Board following ARB 38 in 1949. To reflect the inadequacy of dichotomous classification, APB Opinions 5, 7, and 31 (AICPA [1964, 1966, 1973]) stressed appropriate disclosures to inform users of the distortions imposed by the traditional taxonomy and thereby improve signal fineness. The use of multiple objective tests for purchase equivalence embodied in SFAS 13 (FASB [1976]) can be viewed as a DU-based attempt to reduce the noisiness of lease reporting.

These standards paid little attention to the potential responses of the agents whose attempts to maximize their own welfare started the leasing

game. Noncooperative behavior has dominated the evolution of lease accounting, and some standards encourage such behavior. Managers have attempted, apparently with some success, to classify financial leases as operating rentals. From the shareholders' and bondholders' point of view, such attempts lead to a divergence between expected and actual resource allocations. In reaction, share and bond prices may be bid down to reflect the diffusion in expectations created by self-serving management; compensation plans may be rewritten to place bounds on the compensation effects of managerial discretion; or more auditing may be demanded. Any of these outcomes can lead to a weakening of the contracting set that we call the firm. Such a result is ultimately inferior for managers as well as for other participating agents.

The tailing off of new lease standards appears to be due to the FASB's having imposed sufficient costs on avoiding capitalization as to exceed marginal benefits. This solution imposes costs on practically all agents. However, it appears that innovative management has recouped lost momentum by shifting to other types of financial instruments or inventing new ones.

The contracting perspective suggests a simple conceptual solution to the spiral in which each new standard creates new loopholes. If the motives of, and opportunities available to, managers can be inferred *ex ante*, we could construct a standards-setting process that anticipates self-interested accounting choice. A major weakness of current accounting for financial instruments is the all-or-nothing approach to classification. As long as leases are dichotomously categorized as assets or expenses, self-serving choice will be encouraged. The existence of arbitrary break points, such as the 90 percent rule, exacerbate the problem. Even if the rule is applied by disinterested parties, it can lead to dramatically different treatments of transactions that have only minute differences in the neighborhood of break points (such as 90 percent value or 75 percent service life).

For example, consider two firms (A and B) each with $100 of debt and equity (exclusive of capitalized lease obligations). Both have a debt-equity ratio (D/E) of 1. If A enters into a capital lease valued at 80 percent of the leased asset's FMV of $100, A's D/E will remain unchanged. If B enters into a similar lease except that the guaranteed payments are equal to 90 percent of FMV, B's new D/E will be 1.9. Unsurprisingly, different means (1.45 versus 1.85) are obtained depending on whether the SFAS 13 criterion or expected value rules are applied. Of greater interest is the difference in variance. SFAS 13 yields a variance of 0.5, whereas the variance based on expected value is 0.005. If we assume a more reasonable distribution of

expected values (e.g., D/E increasing in intervals of 0.05 from 0.55 to 1.0 for ten firms.), the differences in variance remains at over 100 percent (0.048 as opposed to 0.023).[4]

Thus, the discontinuity of results can be reduced (with corresponding reduction in the incentives for manipulation) by reporting expected values instead. However, reporting of expected values may induce managers to engage in a different kind of manipulation—the manipulation of subjective probabilities. Further investigation would be necessary to determine whether such substitution is a dominant solution.

VI. Conclusions

OBSF may be described generally as netting out a pair of negatively correlated resources against each other to omit both from a firm's balance sheet. Such treatment would be fully justified if the negative correlation were perfect. In practice, perfect correlation is rarely achieved and justification for off–balance sheet treatment depends on the degree of imperfection. Since the off–balance sheet threshold is essentially a subjective judgment about negative correlation, the current regulatory stance offers managers an opportunity to push this threshold toward zero.

We have considered three major issues concerning off–balance sheet financing. Three perspectives on financial reporting—representative faithfulness, decision usefulness, and contract theoretic—have a hierarchical relationship to one another. Consideration of RF enters into individual decisions and individual decisions in turn constitute moves in a game among economic agents. The FASB appears to have stopped short of taking this last step in setting accounting standards. The history of leasing and lease accounting is an example of the instability that results from a failure to recognize the gaming nature of the accounting environment.

If intertemporal stability of accounting standards were regarded as a desirable attribute of the accounting environment, contract theory suggests that the regulators might want to strive for accounting rules that define a game whose Nash equilibrium is acceptable to them as an outcome. Nash equilibrium of a game describes those set(s) of individual strategies or decision rules that, if followed by all participants, yield outcome(s) that cannot be improved on by any one of the participants through unilateral defection. Empirical work in game theory suggests that outcomes of most

4. This distribution is arrived at by assuming that all firms have $100 of debt and $200 of equity exclusive of lease activity. The calculated variances are obtained by assuming that the leases have expected values ranging from $10 to $100 in $10 increments.

games can be predicted accurately by assuming that agents choose Nash decision rules. In other words, Nash equilibrium is a good descriptive model of how people behave in interactive economic environments. Investors, managers, auditors, and other agents play a financial reporting game whose rules are defined, in part, by the Securities and Exchange Commission and the FASB. In order to assess the consequences of proposed regulatory actions, it is reasonable for them to assume that outcomes will lie with the set of Nash equilibria of the game.

We have no algorithm for determining Nash equilibria for the complex game of financial reporting. But then, there is no general algorithm for arriving at accounting rules that fulfill the RF and DU criteria either. Yet the consideration of these criteria helps regulators frame the debate and narrow down the range of choices. The concept of Nash equilibrium still provides a useful guideline for the rule makers to inform themselves of the consequences of their proposed actions. If an accounting standard is based on assuming a behavior on the part of some individuals that does not appear to be in the best interest of the individuals, there is a good chance that such an assessment of consequences may prove to be incorrect.

It may be fruitful to undertake the exercise of constructing action-reaction sequences for proposed rules. Accounting rules that fulfill the RF or DU criteria can be the starting points of such exercises. We may end up adopting accounting rules that are not the best by RF and DU standards but that constitute achievable, enforceable, and stable solutions in our imperfect world.

After considering the duality of stocks and flows, we conclude that it is not possible to construct perfectly articulated balance sheet and income/cash flow statements. Perfect articulation would force inclusion of highly uncertain correspondent variables in financial statements. On the other hand, abandoning articulation completely is not feasible either. As firms enter into increasingly complex contractual arrangements, a feasible solution is to begin to experiment with extended disclosure of terms of contracts in the financial reports. The cost of this move–more pages and fine print—is not welcome in itself. But that is the choice made—not by accountants, but by the managers who design complex contracts.

Finally, a consideration of the statistical attributes of resource flows and of contracts (off–balance sheet financing as well as other financial instruments) leads us to suggest that the rule makers might consider proposing (1) explicitly probabilistic reporting of financial estimates in instances where frequency data from the past can be used to support such reports and (2) explicit statistical criteria for recognition and defeasance of assets and liabilities under such circumstances. Under the current system, all probabilities

(with the exception with respect to estimated liabilities) as well as correlations must be reduced to either zero or one. This practice encourages game playing on the part of managers because small changes in the terms of contracts in the neighborhood threshold values can have large effects on the appearance of financial statements. Expected value reporting will eliminate this discontinuity, so that small changes in the terms of contracts will have only small effects on the appearances of financial statements and will thus discourage the sort of behavior that has created the crisis of accounting for off–balance sheet financing and financial instruments.

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