



Windmill Fighters in Potemkin Villages

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"Look there, friend Sancho Panza, where thirty or more monstrous giants rise up, all of whom I mean to engage in battle and slay, and with whose spoils we shall begin to make our fortunes. For this is righteous warfare, and it is God's good service to sweep so evil a breed from off the face of the earth."

"What giants?" said Sancho Panza.

"Those you see there," answered his master, "with the long arms, and some have them nearly two leagues long."

"Look, your worship," said Sancho. "What we see there are not giants but windmills."

Miguel de Cervantes: Don Quixote (1605)

1. DB Plans and Their Critics

There are obvious signs of trouble with defined benefit (DB) pension plans. Numerous studies, as well as articles in international, national, and local press, report that a number of plans - large and small, public and private - are in poor financial health. There is no shortage of warnings about upcoming financial calamities caused by the burden of enormous pension costs. Many plans are looking for ways to make future pension cost more manageable; they are also seeking additional sources of funding. More and more pension plan managers have discovered that the cost of providing promised benefits is much higher than they had anticipated. More and more plans are closed to new entrants, frozen, or terminated. Authorities are trying to react to these developments and reform regulations that govern the DB system. All in all, the flow of negative publicity about DB plans is not expected to fade away anytime soon.

Even though the number of DB plans has been declining since the mid-1980s, a sharply negative attitude toward them is a relatively new phenomenon. The DB pension system as a whole was considered rather healthy as recently as in 1999. That consideration was based on accounting statements that, for many plans, exhibited reassuring surpluses at the time. A couple of years later, the same accounting statements showed troubling deficits, due, for the most part, to a combination of falling interest rates and equity prices. At that time, the situation was swiftly (perhaps, too swiftly) dubbed "the perfect storm", and the blame started to spread. More on the perfect storm and the blame game will follow in later sections.

While some lonely voices have been expressing their concerns regarding pension accounting and asset allocation for quite sometime, "the perfect storm" has prompted more people to participate in the pension debate. Economists, pension plan managers, public officials, accountants, actuaries, asset managers, and others have suddenly discovered the shortcomings of DB plans. Throughout this article, I collectively call the participants of this debate, for brevity and lack of a better term, "analysts". The number

of these analysts has been growing like a snowball down a mountain. Combined efforts of the old and new critics of DB plans have produced a flow of publications that has made a substantial contribution to the general negative sentiment toward DB plans. Virtually without a dissenting voice, the analysts have described the state of affairs in the pension system as unacceptable. The language employed in most publications has been quite pessimistic.

This debate is noteworthy for several reasons. Most analysts believe that the DB system is worth preserving. Most analysts also believe that the first step toward a better system should be a reform in pension accounting. Most analysts are in agreement about what exactly needs to be done in the area of pension accounting. Most analysts are confidently predicting that pension accounting will be reformed in the near future. Yet, few believe that the upcoming reforms will be helpful for the survival of the DB system. Moreover, some even admit that the reforms will probably accelerate the system's demise.

We are witnessing a remarkable development. A valuable part of the financial security system is rapidly disintegrating. Numerous practitioners in the areas of capital markets, financial reporting and public policy as well as academic economists have proposed new "economically proper" ways to evaluate DB plans. Yet, these proposals have failed to impress current and potential plan sponsors, who either leave the system or decline to enter it. The disconnect between the proposed solutions and the required steps to make the DB system attractive to plan sponsors is simply extraordinary.

The purpose of this article is to explain why this collective wisdom has not worked so far, even though it is based on seemingly valid and broadly accepted economic arguments. I review the existing flaws of DB plans, as perceived by the analysts, present their apparent consensus approach to fixing those flaws, expose the deficiencies of the approach, and sketch a better one.

To make this article more focused, I use two recent publications on the subject of the shortcomings of DB plans as examples of well-presented opinions written by well-intentioned well-informed impeccably credentialed practitioners. A chairman of one of the largest state pension funds and a former chairman of a powerful regulatory commission published op-ed pieces in leading newspapers.¹ Their assessment of the situation in the pension system is decisively disapproving. Their words are unmistakably alarming: "Alice in Wonderland accounting fictions", "latitude for abuse", "shell game", "shroud of mystery", and, my personal favorite, "Potemkin accounting". When a prominent expert in the field of capital markets is compelled to bring up a Russian military leader from the 18th century, something must be wrong with the economic arguments available to the debate's participants. I think the time has come for a quiet reflection on the state of this debate.

2. Legacy of Potemkin

Before we take a closer look at the problem of "Potemkin accounting", I should, in all fairness, say a few words about the man whose name is featured in this phrase.

“Potemkin accounting” refers to Grigory Potemkin (1739–1791), a high-ranking government official and one of the most powerful men in Russia in the last quarter of the 18th century. Potemkin helped bring Catherine the Great to power (eventually becoming one of her closest confidants), fought with distinction in several wars, and, as the governor-general of New Russia (southern Ukraine), played a leading role in the development of the region. In fact, the development of New Russia was so unbelievably rapid and successful, that Catherine, in order to verify abundant rumors about Grigory Potemkin, decided to inspect the region personally. If it hadn’t been for that trip, there would have been little chance for Grigory Potemkin’s name to become a catchword; it would have been even less likely for his name to appear in the debate regarding the U.S. pension system.

Catherine and her court traveled to the region largely via riverboats. While the main objective was to inspect new seaports, shipyards, arsenals, and battleships, the travelers had ample opportunities to observe villages on riverbanks. Those villages eventually became the best-known myth about Grigory Potemkin. Potemkin apparently irked one of the European envoys to Russia so much, that, after both Catherine and Potemkin passed away, the envoy started publishing wild stories and anecdotes about Potemkin.² In particular, he alleged that Potemkin built the riverbank villages for the sole purpose of camouflaging the true living conditions in the region. Even though historians consider this story absolutely worthless (as well as nearly all anecdotes about Potemkin produced by the envoy), the phrase “Potemkin villages” has come to mean a ploy to conceal the truth. Thanks to the envoy, “Potemkin” has become a synonym for deception. As a result, we have the gem of “Potemkin accounting”.³

3. Windmills of Pension Accounting

I have no intention of arguing about the appropriateness of equating “Potemkin” and “deception”. The meaning of the term “Potemkin” is well-established, and it is probably too late to ask for reconsideration. For the purposes of this article, I assume that the “Potemkin villages” story is true, and the whole set – houses, barns, windmills, etc. – was indeed built to deceive the empress.

In light of this assumption, here is a perception one gets from numerous publications on the subject of pension accounting. Pension accounting, as it stands at this moment, is one colossal Potemkin village built for the sole purpose of hiding the “true financial health” of real pension plans. Most analysts don’t like this village; they are demanding “to bring transparency and honesty back to pension accounting”⁴; they want to make pension accounting “accurate” and “transparent”; they want to shed light on places where the sun has never shone. The analysts look at the village and see gigantic creatures with long arms whirling silently in space – the windmills. According to analysts, those windmills – the most visible structures in the village - are evil giants. The only way to fix the village is to defeat them.

It's about time to bring up the world's most famous windmill fighter. Don Quixote of La Mancha, the old, impoverished, frenzied noble who sought adventures and the glory of knighthood, is a famous character of Miguel de Cervantes, one of the greatest Spanish writers. Don Quixote was an old-fashioned man even for his time, and that was more than four hundred years ago. He saw giants, armies, and oppressed people in places where his less romantic squire Sancho Panza observed much more prosaic objects. It's Don Quixote's creative imagination that brings him into this debate. He believed that his fight with the windmills was of great consequence.

And so do our analysts – they believe that reforming pension accounting is of great consequence. Surprisingly, virtually all analysts are in agreement about what needs to be done. They have identified two windmills in the village, a gigantic one and not-so-gigantic one, “all of whom” those analysts wish “to engage in battle and slay.”

The gigantic windmill is the poorly chosen discounting rates utilized to calculate the present value of pension commitments under existing accounting rules. Analysts want these discounting rates to be closely related (preferably, equal) to the current term structure of interest rates. The present value of the pension commitment calculated this way is a good approximation for the price of a group annuity contract with an insurance company to make all pension payments accrued up to date. This present value is also a good approximation for the price of the hypothetical matching high quality bond portfolio; this value is often called “the economic liability”. As it stands now, the relationship between discounting rates used in existing accounting statements and the current term structure of interest rates involves a certain level of “smoothing”. Changing this relationship to a better one – ideally, equal to the current term structure of interest rates – is considered to be of paramount importance by the analysts. As a telling indication of the overall attitude toward the issue of “smoothing”, a research report from one of the largest investment banks claims that the Financial Accounting Standards Board members “feel strongly that smoothing *is public enemy #1* and the real economic liability needs to be recognized”, see Latter [2005].

The not-so-gigantic windmill is various volatility-concealing (smoothing) procedures in the existing accounting statements (e.g. a “smoothed” value of assets, as opposed to the market value of assets). Even though most of these procedures are optional, their elimination is considered important as well.

As soon as we triumph over these windmills, the analysts insist, as soon as we fix the discount rates and eliminate the “smoothing” procedures, investors, taxpayers, regulators and plan participants will get everything they need to know about DB plans and “we shall begin to make our fortunes.”

Even though I agree with many points taken by these analysts, count me as a skeptic. As discussed in later sections, accounting is incapable of providing comprehensive analysis of future economic events (e.g. pension contributions). Therefore, stakeholders of DB plans have to find essential information regarding their plans outside of pension accounting. But even if we stay within the boundaries of pension accounting, as we do in

this section, the usefulness of proposed reforms is questionable. It is true that pension accounting, as it stands now, is a mess. So, by all means, let's grant today's windmill fighters all their wishes and reform pension accounting any way they wish. Let's assume the windmills have been defeated and the reforms have been implemented.

For a particular DB plan, the reformed accounting report shows the "market" value of liabilities (the price of an annuity contract with an insurance company for all benefits accrued up to date) and the market value of assets, clearly and prominently. Outside of these values, the reformed report contains little economically significant information of any kind. These values disclose whether or not the plan has enough assets to be terminated. This is a fair indicator of the plan's solvency, if we consider the plan as a stand-alone entity.

If we consider the plan as part of a larger organization, however, the reformed report contains serious problems. Let's consider this information for financially healthy and distressed organizations separately.

If the organization is financially healthy and plan termination is not an option, then the availability of assets for termination is simply of no interest. If the organization is financially healthy and termination is possible, then these market values are more informative. But in this case, there is another problem - the reformed report significantly underestimates the cost of termination. I don't think it's reasonable to believe that, for a financially healthy organization, a valuable part of an employee's compensation can be taken away without replacement and with no adverse consequences for the organization. Unless we believe that employees are ignorant about their compensation, the replacement (e.g. a new DC plan or significant improvements of the existing DC plan) must be of equal or greater perceived value. But the cost of potential replacement is not part of reformed accounting. It doesn't mean that this cost and other costs associated with any plan termination (e.g. potential loss of key employees and litigation) don't exist – they are just hidden at the moment. If the plan were terminated, pension assets and liabilities would disappear (assuming they are perfectly matched), but the cost of the replacement would pop up somewhere else in accounting statements. The impact of that cost on the overall picture is far from obvious. Clearly, for a comprehensive analysis of the organization's labor costs, we need to know much more than just the market values of assets and liabilities.

To recap, reformed accounting information for a financially healthy organization is either of little interest or insufficient for the purpose of evaluating the organization's labor costs.

For a financially distressed company, however, the plan's termination without replacement is not inconceivable. In this case, the availability of assets for termination is important and should be of great interest to the stakeholders of the organization.

I'd like to emphasize that reformed pension accounting is a big improvement over existing standards. At the same time, it is clear that the usefulness of reformed

accounting is somewhat limited. Here's the area where information provided by reformed accounting is unquestionably helpful. *Reformed pension accounting shows the availability of assets for termination of a pension plan for a financially distressed plan sponsor.*

The troubles with reformed accounting become more evident when it's used to measure the overall financial health of the pension system. To come up with one all-inclusive measurement, analysts normally just add up assets and liabilities from accounting reports of numerous pension plans. Even if all those plans utilized the same actuarial assumptions and reported on the same day - they do neither - it would still be challenging to interpret the aggregation of accounting reports in a meaningful way. Here's what the results would indicate. If all sponsors of DB plans got into financial trouble at the same time, sold all their pension assets on the same day, and immediately used the proceeds to buy annuity contracts for all benefits accrued up to date, they would collectively have a certain amount of leftover assets (as in 1999) or they would be short by a certain amount (as in 2004). Analysts seem to believe that the results of these earth-shattering hypothetical transactions are helpful in understanding the long-term health of the DB system. If all sponsors of DB plans became financially distressed at the same time – and that would include more than 300 companies from the S&P 500 – then under-funded pension plans may not be our biggest problem.

Given all these shortcomings of reformed accounting, it's fair to ask if we can do any better. The answer is no and yes. If we stay in the area of traditional pension accounting, I believe the proposed reforms are, for the most part, as good as it gets. At the same time, I believe that we can do much better. But to do so, we will have to expand the concepts of pension accounting, or, even better, leave pension accounting behind altogether. The problem is traditional accounting is particularly unfriendly to any kind of forward-looking analysis, but that is exactly what DB plans need. We have to look for a place where forward-looking analysis of DB plans can find a better home.

As it stands now, all that analysts care about is pension accounting. This perspective creates what I call an *accounting bias*. A recent collective outcry about “the perfect storm” is a clear sign of the accounting bias and a good example of an over-reaction to accounting deficits.

Was there a storm? Absolutely. In the nineties, many sponsors expanded their pension benefits without realizing their costs. Investment risk had gone under-appreciated until the capital markets stopped being accommodating. In particular, equity prices declined significantly between 2000 and 2002. That's the storm.

But was the storm “perfect”? Absolutely not. Among several other mitigating factors, the storm had three major “imperfections”.

1. There are numerous broadly recognized benefits of low interest rates and inflation for the economy. In a low interest rate environment, it is harder to terminate a DB plan, but it's easier to generate earnings sufficient to fund future benefits.

2. Most plans had a significant portion of their assets invested in nominal bonds that did well in a declining interest rates environment.
3. Pension commitments for most plans are, to some extent, linked to inflation.⁵
Declining inflation means lower future payouts without lower future living standards.

Rising interest rates with no end in sight would have been much worse for the economy in general and the pension system in particular, although accounting reports would have probably looked satisfactory.

While it can be plausibly argued that there was “the perfect storm” in pension accounting, we should recognize that the pension system is much bigger than pension accounting. Low interest rates and inflation have a strong negative impact on pension accounting reports, but they are good for almost everything else. Just as accounting reports in the late nineties were overly optimistic and saw no storm ahead, the picture we see in today’s accounting reports is probably undeservedly pessimistic for many sponsors. This is the accounting bias in action.

The confines of traditional pension accounting force analysts to operate in a purified world of risk-free assets and cash flows. In this environment, analysts should be prepared to be surprised, pleasantly or unpleasantly, about the financial condition of DB plans over and over again. Their attitude toward DB plans is bound to jump from despair to euphoria and back to despair – all according to movements of the yield curve. As far as pension plans are concerned, analysts would view falling inflation and interest rates as a “storm”, while almost everyone else would be happy; analysts would view raising inflation and interest rates as a positive development, while almost everyone else would be concerned. This perspective may put the analysts at odds with many others whose worldview is not tainted by an accounting bias.⁶

4. Whose Fault Is It?

In general, blaming someone for some undesirable developments isn’t a terribly valuable activity. Unfortunately, many analysts are happy to point at certain groups of individuals whose alleged lack of professionalism has caused this adverse situation in the DB system to transpire. My approach in this article is to go along with what the analysts want to do and see where it gets us. For that reason, if the analysts wish to be engaged in the process of finding those responsible for this situation, let’s look into this issue.

According to the analysts, the biggest facilitators of “Potemkin accounting” are actuaries. It has become fashionable these days to blame actuaries for a lack of education in the area of financial economics, for ignoring “real-world economic assumptions” and other wrongdoings. According to some analysts, pension actuarial science has failed to incorporate principles of financial economics.⁷ A common theme in numerous publications is if actuaries had just been better educated in modern financial economics, the situation in the DB system would have been much better.

As a matter of fact, this is a misrepresentation of the role actuaries play in the U.S pension system. Actuaries are responsible for neither pension plan risk management, nor prudent allocation of pension assets, nor solvency of the DB system as a whole. The job of the overwhelming majority of pension actuaries is to certify compliance with relevant regulations, that's all. Those regulations utilize a small and outdated segment of actuarial science. Most actuaries are well-aware of the numerous shortcomings of the regulations in their field. Obviously, actuaries could have done a better job suggesting and promoting better regulations, but the same is true for economists, accountants, public officials, pension plan managers, and many others. Actuarial firms also could have come up with better products, services and analytical tools, but the same is true for investment banks, rating agencies, academic institutions, software vendors, and many others.

Another group of practitioners that often finds itself on the receiving end of the blame game are investment consultants. Like actuaries, the investment consultants have allegedly utilized inferior methodologies and models as well as failed to promote "accuracy", "transparency", "real-world economic assumptions", and principles of financial economics.

The case of investment consultants is much more interesting. After all, the regulations in the area of asset-liability analysis of pension plans that investment consultants provide are considerably less onerous than the ones governing annual actuarial valuations of pension plans. The asset-liability models investment consultants utilize must comply with the principles of several scientific disciplines and common sense, but not numerous sections of the Internal Revenue Code. Unlike conventional pension actuaries, investment consultants do recommend asset allocation decisions. Compared to actuaries, investment consultants have more room to tailor their services to the needs of their clients. These clients, by and large, want to know how their financial statements will look in the future. Therefore, investment consultants use pension forecasting models to show the ranges of values of various components of those financial statements under different economic scenarios. Even though the forecasting models have numerous deficiencies,⁸ pension forecasting is popular and broadly accepted, and it's informative to understand why.

In the case of a corporate pension plan, the sponsor undoubtedly cares, among other things, about how equity analysts and rating agencies that cover the sponsor, as well as regulators and many others, perceive the plan. If, for example, a rating agency concentrates on a particular accounting statement, the sponsor wants this statement to look as good as possible, even if the statement is an outrageous demonstration of "Potemkin accounting". Naturally, the sponsor wants to know what the statement will show next year and beyond. To satisfy the client's demand, the investment consultant assists the client in developing economic assumptions for the statement and runs the forecasting model that replicates the procedures of "Potemkin accounting" under numerous scenarios including the ones that some would call "Alice in Wonderland accounting fictions". As a result of this exercise, the consultant may recommend a policy portfolio that, due to the existence of numerous risk-concealing accounting "fictions", looks less risky than it actually is.

Many analysts would blame the consultant for taking advantage of “Potemkin accounting”, but the blame is misplaced. Imagine that the rating agency, instead of slavishly accepting the bottom line figures as they appear in the statement, recalculates them in an “un-smoothed” way using “real-world economic assumptions” (which may require some work, but it is not terribly difficult). Imagine also that the agency makes no secret of its methodology. Understandably, the consultant stops using “Potemkin accounting” and starts using the rating agency’s “real-world” economics. In that case, many analysts may even decide that the consultant is not a crook after all, but a great professional and a wonderful humanitarian.

Clearly, the consultant’s actions are driven by the demands of the marketplace. “Potemkin accounting” may be bad, but there are certain entities that utilize it. Some of these entities may be very important to the well-being of the sponsor (rating agencies, equity analysts, regulators, etc.), so their demands can’t be easily dismissed.

Inadvertently, I’ve just identified a new player in the blame game. It is the all-important entities that insist on the inviolability of accounting figures regardless of their economic value. However, I wouldn’t necessarily recognize this development as a clear cause for celebration.

These all-important entities may have valid arguments in their defense as well. A rating agency, for example, may say that it would love to use some advanced forward-looking analysis, but little has been available outside of flawed accounting statements so far. Even if some forward-looking analysis were available, it would depend on a set of forward-looking assumptions. Different rating agencies, equity analysts, and everyone else may utilize different sets of assumptions and come up with different results. Expect neither conventional “accuracy” nor “transparency” from these activities.

So, whose fault is it? I think we’ve had enough of these arguments. The blame game should stop. Obviously, it serves no useful purpose.

5. Compulsory Accounting vs. Flexible Accounting

The discussion in the previous section touched on a very important question. Is it absolutely necessary for all stakeholders to be in perfect agreement about “bottom line” accounting figures?

To look at this problem from a different angle, imagine that 10% is used as the long-term return on assets in the pension expense calculation for the purposes of a certain pension accounting statement. Some analysts may vociferously accuse the plan sponsor and its consultant for not using “real-world economic assumptions”, but they can do much better than that. Analysts may simply ignore the pension expense calculated under the 10% assumption. As long as the report provides all other components of the pension expense, any analyst is free to input her own assumptions into a simple worksheet and get her own pension expense figure right away. Chances are these analysts do not buy and sell pension plans; therefore, different valuations do not create arbitrage opportunities.

To look at the same problem from yet another angle, imagine that the pension commitment (the stream of benefit payments promised to the plan participants) is readily available to the analysts. If the sponsor used a “smoothed” discounting procedure to calculate the present value of the commitment, some analysts may, once again, vociferously accuse the plan sponsor and its consultant for not using “real-world economic assumptions”, but they can, once again, do much better than that. Analysts may simply ignore this present value, apply their own discounting procedures and come up with their own present values “marked” to any “market” these analysts want this present value to be “marked” to.

In reality, these “marked-to-market” values are not hard to get even without the proposed accounting reforms. Fairly modest efforts are required to “un-smooth” the values reported in existing accounting statements. Getting the “marked-to-market” values may present a certain level of inconvenience and require additional resources. Different analysts may come up with somewhat different estimates (all pension accounting values are estimates anyway), but the fact remains the “marked-to-market” values are available to those who need them. So, what are we really discussing - financial deceptions or acceptable levels of inconvenience for analysts?

These observations emphasize fundamental structural problems with existing accounting principles. Few believe the complexities of today’s business practices can be accurately described by a handful of bottom line figures. Financial arrangements that involve contingent future cash flows of uncertain timing and magnitude (like non-tradable non-transferable pensions or employee stock options) are hard to squeeze into the Procrustean bed of existing accounting concepts. Different analysts should be able to value those financial arrangements differently.

We are facing two fundamentally different types of accounting. As far as accounting information about past events is concerned, both types are absolutely identical. The differences between them become evident when there is an attempt to “account” for uncertain cash flows in the future.

The first type – I call it “compulsory accounting” - allows no deviations from its results. All values are final - everyone must agree with every single reported value. There’s only one economically proper set of assumptions, a.k.a. “real-world economic assumptions”. The proponents of compulsory accounting believe that accounting reports can present future economic events accurately and transparently.

The second type – I call it “flexible accounting” – provides the same components and “bottom line” figures as compulsory accounting. However, the components of accounting reports may be presented under different economic scenarios. For example, the pension expense can be calculated using both 10% and 5% as the long-term return on assets. Liabilities can be calculated using several discounting procedures - today’s Treasury yield curve, the sponsor’s cost of capital, single discount rates from 5% to 10%, or anything else. In other words, flexible accounting provides a collection of building

blocks for the calculation of bottom line figures and leaves the final calculation to analysts. The reported bottom line figures are just examples of proper applications of accounting rules. For example, if you don't like the liability used in the calculation of a certain bottom line figure, use your own liability, be a mensch.

Flexible accounting is every bit as proper as compulsory accounting – both types present audited financial information prepared by a certified professional. However, the proponents of flexible accounting exhibit an entirely different attitude toward future events. They believe that we live in a risky world, and everyone has a right to have unique risk tolerance characteristics and apply them to come up with unique valuations of future events. The proponents of compulsory accounting believe that the future can be “transparent”. In contrast, proponents of flexible accounting humbly acknowledge that *we don't know what will happen in the future* and act accordingly.

Today's windmill fighters can function only within the boundaries of compulsory accounting. Their rightful indignation wouldn't impress anyone in the flexible accounting environment. If an analyst doesn't like a figure that is based on a 10% assumption for the long-term return on assets, a figure that is based on the assumption of 5% is right next to it. If the analyst doesn't like the utilization of the market-related (a.k.a. “smoothed”) value of assets, the fair value of assets is right below it. If the analyst doesn't like the discounting procedure used in the calculation of the liability, the analyst should be at liberty to use any discounting procedure that serves the analyst's objective. If the analyst doesn't like the accounting pension “income”, the analyst should be at liberty to ignore the “income” altogether or apply any (positive or negative) P/E multiple to this “income”. Once again, different objectives may require different valuations.

Reflections of compulsory accounting are everywhere. Proponents of flexible accounting are few and hard to find.⁹

6. Example of Flexible Accounting

To demonstrate the advantages of flexible accounting, I sketch out an example of how to “account” for the long-term economic cost of running a pension plan in that framework. I define the long-term cost in a somewhat qualitative manner.¹⁰ Here are the essential steps in the calculation.

1. *Benefit Stream.* Calculate the stream of benefit payments that, according to the plan's benefit package, will be paid to plan participants. This calculation is based on the existing demographic characteristics of the plan including the active and inactive population data as well as rates of mortality, turnover, retirement, and disability. This stream represents total benefits to be paid to plan participants – it is based on past and future service. It should be emphasized that the benefit stream is a series of volatile contingent future cash flows.
2. *Payroll Stream.* Calculate the stream of payroll values for the existing active population. Similar to the benefit stream, this calculation is also based on the demographic characteristics of the plan including the existing active population data

as well as rates of mortality, turnover, retirement, and disability. This stream is a series of volatile contingent values as well.

3. *Present Values.* Calculate present values of the benefit and payroll streams. The discounting procedure is based on the returns produced by the existing policy portfolio. In the simplest case, the streams are discounted using compounded independent observations of the policy portfolio returns. In other words, for discounting purposes, we use a series of independent identically distributed random variables that have the same distribution as the return of the existing policy portfolio. The distributions of both the present value of future benefits (PVFB) and the present value of future payroll (PVFP) “know” something about the riskiness of the policy portfolio, the volatility of benefit payments and payroll, and the demographic and benefit characteristics of the plan.
4. *Long-Term Cost.* Finally, the long-term cost as a fixed percentage of payroll is defined as the difference between the present value of future benefits and market value of assets divided by the present value of future payroll: $Cost = \frac{PVFB - MVA}{PVFP}$, but not less than zero.¹¹

The distribution of the long-term cost should be of great interest to all stakeholders of the plan. In particular, various percentiles of the long-term cost may provide valuable insights into the risks associated with running a pension plan. Some analysts may use the median cost for the purposes of determining the “pension expense” in their valuation models; some others may use the 70th percentile of the cost; more conservative analysts may use even higher percentiles. An “accounting” report containing this kind of information can be useful for analysts with various levels of risk tolerance. This is flexible accounting in action – a set of outcomes of future economic events is presented to stakeholders, and everyone is at liberty to pick a value that fits her level of risk tolerance.

This approach may generate serious objections from the proponents of compulsory accounting. The calculations of long-term cost involve future service – the benefits plan participants will accrue after the statement’s valuation date. The principles of accounting may not allow accounting for benefits that have not yet been earned. My response to this argument is “that is correct”, but only seemingly so. The calculations of long-term cost presented above amortize the cost of “not-yet-funded” future benefits over the course of future active service. The calculations utilize the rates of mortality, turnover, retirement, and disability. In reality, the utilization of these rates and the principle of amortization “over the course of future active service” have been vital components of pension accounting since its inception in the mid-eighties. These rates play a direct role in the calculations of traditional accounting liabilities – ABO and PBO. Traditional accounting rules have always allowed experience gains/losses to be amortized over the course of future active service, which is currently calculated in a very simplistic manner. In that respect, the long-term cost calculations present nothing conceptually new compared to existing accounting methods.

Another objection may be that accounting statements are not the right place to express one's risk tolerance. My response to this argument is "that is correct" as well. If traditional accounting reports can not accommodate the long-term economic cost of running a pension plan, stakeholders will have to get this information from other sources.

The proponents of compulsory accounting may also say that if anyone could just pick any number as the "pension expense", there would be no transparency in accounting statements. My response to this argument is "that is correct" as well. The future is not transparent, period.

I'd like to make it clear that information about the long-term economic cost should be used in conjunction with the short-term "marked-to market" assets and liabilities provided by reformed accounting. Depending on the conditions of a particular plan, the short-term or long-term considerations would be of higher significance.

7. Potemkin Village Remains

The concept of flexible accounting may appear to create serious difficulties for the general public. After all, if one believes that pension accounting is confusing, the multitude of versions of pension accounting statements available in a flexible accounting environment may create even more confusion. However, the general public has no problem dealing with this "confusion" in other areas. If the general public needs information about future uncertain events, the marketplace usually produces information to satisfy those needs. As we all know, uncertainty breeds creativity. For example, for investors who try to predict future movements of stock prices, there are numerous research reports that provide investors with all kinds of forward-looking information, including estimates of future earnings per share and target prices. While researchers use the same accounting reports, their interpretations, conclusions, and recommendations can be noticeably different.

As another example, think of an individual buying a car. Obviously, the individual wants to know how the car will perform in the future. For this purpose, there are multiple sources of information that include the cost of maintenance and price depreciation statistics (backward-looking analysis) as well as expectations of the car's safety (forward-looking analysis). While consumer reports do not guarantee future results, they are considered to be valuable and reliable sources of information.

This observation brings up arguably the most important message of this article. One of the biggest problems of the DB system is that forward-looking information is mostly unavailable to stakeholders of DB plans. Such information should include the long-term economic cost of running a plan for a given policy portfolio as well as the safety of the accrued and projected benefits. The availability of this information to plan participants would drastically change the situation in the DB system. When plan participants are well-informed, it makes little sense for plan sponsors to have poorly funded pension plans. The participants of a poorly funded plan have no appreciation for the plan and demand other forms of compensation as if there were no pension plan. On the other

hand, the participants of a well-funded plan would have a valuable sense of security that goes beyond asset and liability values in accounting reports. Proper funding of pension plans should come from the forces of labor markets, not from government regulations.

We are nowhere close to this situation. Plan participants, for the most part, are not properly informed about the financial health of their pension plans. Current accounting reports are messy, confusing, and user-unfriendly. On top of it, today's windmill fighters, under the banner of "transparency", wish to purge all forward-looking information from these reports. Obviously, more transparency is desirable, and if numerous analysts wish to see certain accounting values clearly "marked-to-market", there's no reason to oppose the reform that grants their wishes. But no matter how we reform it, pension accounting is unlikely to emerge as the ultimate source of vital forward-looking information about pension plans. *Pension accounting is a mess not because it gives bad answers, but because it answers the wrong questions.*

Numerous stakeholders of on-going DB plans need reasonable estimates of the resources required to fund promised benefits. Pension accounting is of little use to them – it deals with the ability of the sponsor to *terminate* the plan, but provides nothing about the ability of the sponsor to *fund* promised benefits. In reality, plan sponsors would greatly appreciate the ability to grasp how their pension decisions impact their long-term financial health. Pension accounting does nothing of the sort, even if we assume the windmills have been defeated and everything is "marked-to-market".

Let's take a closer look at what we need to know for prudent pension plan management and whether or not pension accounting can be helpful. There are three major areas of great interests to the stakeholders of on-going DB plans in which traditional (compulsory) pension accounting – reformed or not – provides little help.

1. *Benefit Levels.* Plan participants (as well as shareholders and taxpayers) need to plan for their retirement and estimate their pensions at retirement. Such estimates require utilization of future benefit accruals – a concept unknown in traditional pension accounting.
2. *Future Contributions and Payments.* For an on-going plan, the biggest concern is the plan's cost. Stakeholders need to know now how much money needs to be contributed to the plan to fund the promised benefits, and they need this information at the present. Since future pension contributions are contingent cash flows of uncertain timing and magnitude, their present value has volatility. Future benefit payments of on-going pension plans are also volatile – they may depend, among other things, on future wage inflation in a particular state and/or industry. The "market" values from reformed accounting statements are of little use for the purposes of managing the volatility of the present value of future contributions and payments.
3. *Policy Portfolio.* Stakeholders want to be able to control the long-term cost and safety of benefits promised to plan participants by means of prudent policy portfolio selection. But reformed accounting assumes that the assets are invested in the matching high-quality bond portfolio; it has nothing to do with the plan's existing

policy portfolio. As far as pension accounting is concerned, the policy portfolio is irrelevant - \$100 of stocks is the same as \$100 of bonds.

As we see, information about benefit levels and future contributions as well as the impact of asset allocation will not be available to the users of traditional accounting statements. In particular, pension accounting completely conceals the riskiness of the actual policy portfolio and future benefit payments. To get help in these areas, the stakeholders of pension plans will have to find some other source of information outside of traditional accounting statements. That's why traditional pension accounting will continue to be a Potemkin village to many stakeholders of on-going plans.

8. Realities of DB plans

As it has been demonstrated in prior sections, stakeholders must look beyond pension accounting in order to get vital information about on-going DB plans. Unfortunately, those who do try to look beyond pension accounting discover that little information is available at this point. Moreover, it is unclear where to look, what to request and what to expect to see. Most publications don't even acknowledge that there is life outside of pension accounting. The confusion runs so deep, that, in order to take the first steps toward asking the right questions, we have to go all the way back to the basics of DB plans. In this section, I discuss several important concepts that are often misrepresented and need clarification.

1. *What is a Pension Plan?* Most publications on the subject assume that a pension plan is a financial instrument without realizing that this assumption has far-reaching consequences. I don't believe that this is a good assumption for most plans – pension plans are not tradable assets. A pension plan is a human resource management tool, and should be analyzed as such. Methodologies for the analysis of financial instruments may not necessarily be applicable to pension plans.
2. *Pension Commitment.* The core business of a pension plan is to make benefit payments. The plan's demographic characteristics and benefit package determine the pension commitment – a stream of benefit payments to the plans participants. I'd like to emphasize that the pension commitment is not a number, but a series of contingent future payments.
3. *Pension Liability.* I believe that the term “liability” has been misrepresented and misused in numerous publications. This term has an amazing ability to obfuscate relationships between important components of the DB system. The word “liability” means different things to different people, and it usually creates a great deal of confusion every time it's used. This term should simply be avoided. But if someone insists on using it, the true liability of a pension plan is the series of payments promised to plan participants – the pension commitment.
4. *Accounting Value vs. Economic Value.* In general, we measure, or value, objects of our interest not for the sake of measuring, but to achieve a certain objective. Different objectives may require different measurements. When some analysts claim that the price of termination is the only economically proper measurement of a pension plan and call it “the economic liability”, they're essentially saying that

termination is the only “economically proper” objective for a pension plan. The backward-looking nature of traditional accounting allows only one type of valuation – the price of termination. But on-going plans have other legitimate objectives and measurements. For example, there are numerous measurements associated with the existing policy portfolio and its relationship with the pension commitment. Thus, there is a multitude of economic values associated with a pension plan. The accounting value is one of them. In some cases, this value is the most important measurement. In some other cases, this value is simply irrelevant.

5. *Pricing vs. Funding.* There is a fundamental difference between pricing a cash flow and funding a cash flow. Authors of numerous publications assume that a pension plan is a financial instrument and attempt to price it. The objectives of pricing and funding are different, and, therefore, may require different methodologies and measurements of the cash flow. The goal of most plan sponsors is to fund the pension commitment, not to price it.
6. *The Matching Asset.* The matching asset for a pension commitment is defined as a portfolio of tradable securities that has the same payouts – in terms of timing, magnitude, and probability – as the pension commitment. Authors of numerous publications routinely assume that the matching asset (usually, a bond portfolio) exists for every DB plan out there. Of course, it would be nice to have a benchmark that has real meaning. Unfortunately, the existence of such a benchmark is highly questionable - in reality, matching assets for on-going plans rarely exist. If the matching asset for an on-going plan existed, it would have to contain bonds indexed to wage inflation in a particular state and/or in a particular industry; these bonds would have to have maturity of fifty years or more. The existence of a matching asset is another accounting fantasy.
7. *Risk Management vs. Risk Hedging.* Many publications on the subject of risk management of pension plans imply that pension risks must be hedged away at any cost for any sponsor. This “one-size-fits-all” solution is an unnecessary simplification of the problem. Risk management is much bigger than risk hedging. For some plan sponsors, effective risk management in the pension area can create value for shareholders/taxpayers and plan participants. For some others, pension risks may be too much to bear and should be minimized. In any case, the methods of broadly defined asset-liability management should be applied to pension plans individually.

Recognition of these realities would be a good step in the right direction and a foundation for a debate that is more balanced and comprehensive than the one we’ve had so far.

9. Termination Driven Investing

The subject of asset allocation is the main theme of most publications about the DB system. Directly or indirectly, the arguments presented in these publications have significant implications in the asset allocation area. In this section, I attempt to present the latest trends in this area in light of the realities of the DB system discussed in previous sections.

There is a consensus that the asset allocation decision is the main factor determining financial performance of a DB plan. Yet, there’s no consensus about what constitutes an optimal policy portfolio for a DB plan. In order to design a proper policy portfolio for a DB plan, the plan managers have to deal with numerous risks the plan faces. These risks include, but are not limited to, contribution risk, insufficient assets risk, low returns risk, financial statements risk, and insolvency risk. Each risk may imply a set of efficient policies designed for the management of this particular risk. Consequently, plan managers face a difficult task of prioritizing their goals and developing a sensible compromise between them.

But many analysts do not acknowledge the complexity of this task. While correctly criticizing investing and optimizing in the “asset-only” space, they essentially assert that the problem of risk classification for DB plans has been solved. The solution is that pension investments should be driven by “marked-to-market” accounting liabilities. Therefore, pension assets should be invested in bonds and bond-like assets. Unfortunately, few analysts bother to justify this logic. The table below presents my best attempt to describe the major steps in this logic, along with my critique of the logic.

Logic in Favor of Total Bond Allocation

Flaws of the Logic

Step 1.

The principles of financial economics lead to the requirement of valuing pension commitments on a termination basis for the purposes of pension accounting. The price of termination is the only measurement of the plan that deserves to be called a “liability” in accounting statements.

There is life outside of financial statements. For an on-going DB plan, financial statement risk is important, but it is not the only risk. The presence of other risks may require plan managers to consider measurements other than the price of termination (e.g. the present value of future contributions).

Step 2.

Since regulators recognize only one measurement of DB plans (the price of termination), all other measurements are less important or not important at all.

Pension assets should be invested in the best interests of plan participants and shareholders/taxpayers, not regulators and accountants. If plan managers believe, for example, that concerns about the present value of future contributions have a higher priority than financial statement risk, they may view the measurements related to these concerns as more important than the price of termination.

Step 3.

Assets and accounting liabilities should be matched. Therefore, assets should be invested in financial instruments the prices of

The purpose of pension assets is to fund the pension commitment. Plan managers may want to consider a policy portfolio that provides the highest probability that the commitment will be

which behave like the price of termination.

Step 4.

Since the accounting liability behaves like the price of a bond portfolio, the assets also should behave like the price of a bond portfolio. The price of what financial instrument behaves like the price of a bond portfolio? Even actuaries and investment consultants know the answer – it’s a bond portfolio. Therefore, the principles of financial economics require pension assets to be invested in bonds.¹³

Step 5.

Interest rate risk is by far the most important risk for any DB plan. Both theoretical methods and sophisticated investment products to manage that risk are readily available. One of the most straightforward methods of controlling interest rate risk is duration matching. Since the duration of the “liability” is usually higher than the duration of conventional bond indexes, pension plans should invest in long bonds or utilize synthetic methods of duration extension.

funded at a given level of assets.¹² This type of asset-liability matching is more appropriate for the world of risky assets.

As we discussed in the prior section, there’s a fundamental difference between pricing and funding. To “price” the pension commitment, accountants assume the existence of a matching “risk-free” asset and report its price. Since the matching “risk-free” asset doesn’t exist for most on-going plans, any policy portfolio implies a certain level of risk. At some risk levels, a bond portfolio would be the most efficient portfolio; at other risk levels, a well-diversified portfolio would serve the plan participants and shareholders/taxpayers much better than a bond portfolio.

If plan managers do not consider financial statement risk as the most important risk, then interest rate risk is not the most important risk as well. The desire to match durations of assets and “liabilities” makes little sense if the goal is not to control financial statement risk. As a practical matter, the pension commitment for most on-going plans is volatile, and, therefore, doesn’t have a fixed duration to match. Also, prices of most assets outside of bonds do not react predictably to movements of interest rates. As a result, the duration in a traditional sense for those assets can not be determined. Overall, there are great tools out there to control interest rate risk, but managers of on-going plans would be well-advised to be exceedingly cautious before utilizing them.

There is another argument in favor of the total bond allocation. As Fischer Black and other economists noted, the total bond allocation is tax-efficient, see Black [1980]. This argument has been revisited and recommended for implementation in several publications lately. Fortunately, there is no need for me to respond to this argument. No one can respond to the tax arbitrage argument better than one of its creators. Fischer Black revisited the issue of asset allocation for pension plans in Black [1995]. To Fischer Black circa 1995, the plan sponsor’s goal is not to take advantage of the bond tax arbitrage, but to minimize the present value of future contributions – a quintessential forward-looking concept. Unfortunately, most analysts have ignored Black [1995].

The left column in the table above and the tax arbitrage argument present the “financial economics” foundation of so-called “liability driven investing” (LDI) – a new investment product that is gaining popularity in Europe. Plan sponsors in the U.S. have been more deliberate so far, but the product seems to be attracting attention and getting some traction in the U.S. as well.

As we see from this discussion, the foundations of LDI products for on-going plans are shaky at best. LDI products are more appropriate for terminated plans, and should be called “termination driven investing” (TDI). Analysts concerned about the accuracy and transparency of financial information should support this clarification. Or so I’d like to believe.

10. Problems in the DB System

So far, solutions produced by the collective wisdom of numerous analysts have failed to halt the demise of the DB system. I believe that this failure is due to the fact that analysts have not acknowledged fundamental problems in the system and have focused primarily on ways to produce better accounting statements instead. In this section, I attempt to identify the major problems in the DB system.

1. *Pension Regulations and Pension Accounting.* The problems in these areas have been extensively covered in numerous publications. I expect a new regulatory environment to be in place in the near future. At this point, it’s hard to predict how sponsors of well-funded plans will react to the new environment, but it is clear that the survival of the DB system will depend on their reaction.
2. *Forward-looking analysis.* Most sponsors fund their pension commitments by means of investing in non-matching risky assets. The lack of information regarding the long-term impact of benefit design and asset allocation decisions is a major problem. Obviously, this impact is uncertain, but similar uncertainties are measured and managed in many other areas. Theoretical concepts and analytical tools for dealing with uncertain economic events are readily available. As an example of such a tool, consider mean-variance optimization. By definition, portfolios of risky assets generate uncertain returns. Mean-variance optimization provides measurements of this uncertainty and a methodology to manage it. If we believe that the value of a particular measurement of a portfolio of risky assets (e.g. standard deviation of return) is too high, we can re-design the portfolio. Clearly, the identification of appropriate measurements of uncertain objects is crucial to the process of risk management. In order to manage DB plans prudently, we need comprehensive forward-looking measurements of the plans’ financial health. As a step in that direction, Fischer Black noted more than ten years ago that one of the most important objects of a plan sponsor’s interest is the present value of future contributions (see Black [1995]). While initial steps in the stochastic analysis of that object, including valuation and optimization, have been taken, a thorough review of this subject is outside of the scope of this article.¹⁴
3. *Crisis of confidence.* By far, the biggest problem in the DB system is the crisis of confidence in the notion that providing safe retirements is of value to plan

participants and shareholders/taxpayers. To appreciate DB plans more, plan participants should be much better educated about them. To appreciate the value pension plan managers create, shareholders/taxpayers need clear measurements of the managers' performance as related to the core business of DB plans – funding pension commitments. Overall, plan participants and shareholders/taxpayers must be well-informed about the realities of DB plans. At this point, a successful resolution of this situation is a real challenge.

Pretending that these problems can be solved by reforming accounting rules and implementing investment products designed for terminated plans is a financial deception in its own right.

11. Conclusion

This article is dedicated to numerous “analysts” - economists, pension plan managers, public officials, accountants, actuaries, asset managers, and others - that have promoted better accounting rules as a panacea for the problems the DB system has. There is no doubt in my mind that these analysts have a good point - new accounting rules are better than the old ones and should be adopted. A statement that is “marked” to a real market is better than the one marked to “Alice in Wonderland accounting fictions”. However, if that “real market” is chosen arbitrarily and has little to do with the fundamental problems in the DB system, we are not much closer to finding the solutions the system needs.

For that reason, there is no doubt in my mind that the usefulness of the new accounting reforms is greatly exaggerated. As far as the survival of the DB system is concerned, those windmills are only of marginal importance. After defeating the windmills, the windmill fighters may very well discover that they have accomplished very little. Accounting is about the past; pensions are about the future; no accounting reform can resolve this conflict. Most importantly, there is no doubt in my mind that the new accounting rules will do little to halt the demise of the DB system. At some point, the windmill fighters may design a perfect accounting statement for DB plans and discover that it applies to no one.

At the moment, it is hard to determine the odds of the system's survival. But to give the system a fighting chance, the system's stakeholders have to make significant progress in the areas of risk management, communications and education. It remains to be seen if we are up to this challenge.

The analysts have spoken, loud and clear. Dear plan sponsors, we want you to run your plans as on-going, but value them as terminated. We also want you to know that if, at some point, we find your pension assets insufficient to terminate your plans, the punishment will be swift and harsh. So far, the sponsors' response has been loud and clear as well. We're not interested, thank you very much.

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¹ See Kramer [2006] and Levitt [2005]. Orin Kramer is the Chairman of the New Jersey State Investment Council. Arthur Levitt, Jr. is a former Chairman of the Security and Exchange Commission.

² Georg von Helbig, a Saxon envoy to Russia, published a biography of Potemkin sometime around 1800.

³ Potemkin is also remembered for an unrelated reason. More than hundred years after his death, a new battleship was named after "the father of the Black Sea Fleet" – Grigory Potemkin. An uprising of the battleship's sailors against their officers became legendary and attracted global attention in 1905. Twenty years later, Sergei Eisenstein made a movie about the uprising. That movie - *Battleship Potemkin* - is one of the most distinguished films in the history of motion pictures.

⁴ Quoted from Levitt [2005]. From this quote, one may get an impression that pension accounting had both "transparency and honesty" in the good old days, but, somehow, those commendable qualities were maliciously replaced by, I guess, ambiguity and dishonesty. In reality, today's pension accounting is as "transparent" and "honest" as it has always been.

⁵ For plans with pay-related benefit formula, actual pensions are linked to the wage inflation. For flat benefit formulas, the benefits are usually adjusted for inflation on an ad-hoc basis, but accounting reports do not incorporate these future adjustments. Many public plans adjust post-retirement benefits for inflation, although most corporate plans do not.

⁶ For more details on the accounting bias (a.k.a. "FAS87 bias"), see Mindlin [2005].

⁷ For a recent discussion about the relationship between financial economics and pension actuarial science, see Bader-Gold [2003] and Mindlin [2005].

⁸ In particular, as far as their math is concerned, these models are internally inconsistent. For more details, see Mindlin [2005].

⁹ Similar views are presented in Klieber [2003]. A glimpse of the flexible accounting also appears in Arnott [2003]. Speaking about stock options, the author declares “If the Financial Accounting Standards Board will not require expensing options, investment managers owe it to their clients to state the net-of-options earning of a company.” I wouldn’t expect these analysts to come up with identical valuations.

¹⁰ For more technical details, see Mindlin, D. Introduction to Asset-Liability Valuation, Part 2, to be published.

¹¹ Readers familiar with the traditional theory of pension funding may recognize this cost as the normal cost in the “stochastic” aggregate funding method.

¹² As Peter Bernstein put it, “The policy is to provide the investor with the highest probability of being able to pay for the groceries when the time comes”, see Bernstein [2003].

¹³ The next logical step is to conclude that those who oppose total bond allocations are against principles of financial economics (here’s another group to blame). It should also be mentioned that the tax arbitrage and some other arguments have led at least one economist to propose making equity investments illegal for corporate DB plans, see Bader [2004].

¹⁴ For initial steps in that direction, see Mindlin, D. The Role of the Policy Portfolio, Wilshire Associates Incorporated, May 17, 2005.