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DB Plans Under Siege: Can They Survive?

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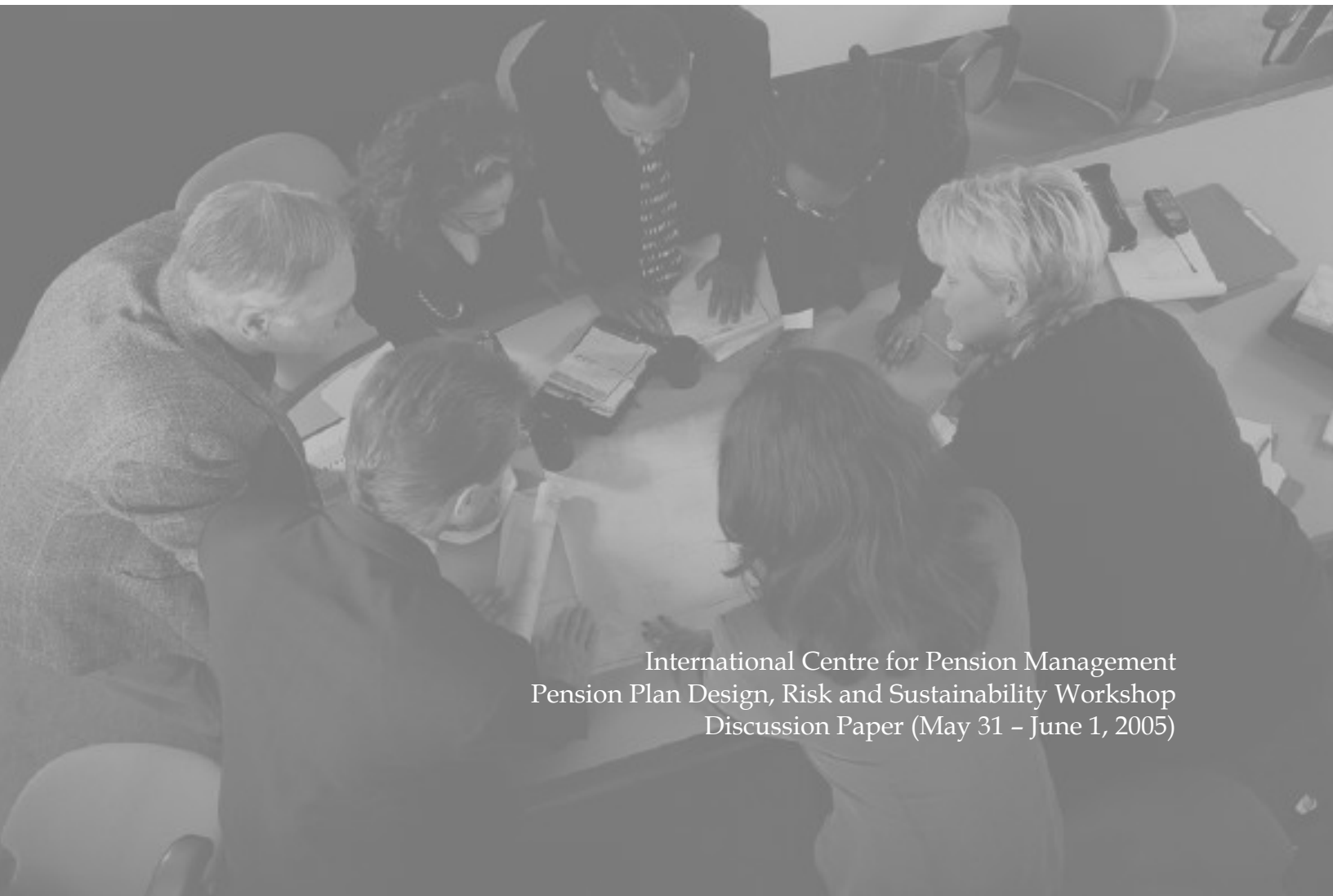

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DB Plans Under Siege: Can They Survive?

DISCUSSION PAPER ABSTRACT
By Keith Ambachtsheer

Most of the discussions we hear and read on the ongoing 'DB vs. DC' debate start with the pre-conception that these two types of pension arrangements are fully articulated, fully understood, and unchangeable. So the debates are simply framed in a DB/DC 'pros and cons/either or' context. The three essays that follow break with this tradition.

Essay #1 asks why people don't just maximize the utility of lifetime consumption by laying out their own optimal lifetime savings-investment plan and then simply executing it. Research suggests most people face two formidable barriers to successfully devising and implementing such a plan. First, creating and executing the plan is a complex undertaking, well outside the bounds of technical and psychological competence of most mortals. Second, employing expert agents to overcome this competence barrier leads to potential agency costs causing people to 'pay too much for too little'.

Essay #2 lays out the *efficient personal pension accumulation model (EPPAM),* which addresses both kinds of barriers. The knowledge/behavioral barrier is addressed by an 'auto-pilot' savings, investment, and annuitization protocol. This protocol aligns income replacement targets with target savings rates and optimal investment/annuitization policies. The agency costs barrier is addressed through the establishment of single purpose expert pension 'co-ops' of sufficient scale to be able to operate these 'auto-pilot' savings/investment protocols at low unit costs. Under reasonable assumptions, *EPPAM*-based pension arrangements will produce materially higher (e.g., twice) the pensions produced by today's typical DC plan.

Essay #3 asks, if relative to this *EPPAM* standard, pension arrangements based on shared risk formulas (e.g., DB plans) can in any way deemed to be superior. There is indeed a theoretical case to be made. Relative to *EPPAM*-based pension arrangements, DB plans offer the additional potential of providing intergenerational investment risk insurance, where the beneficiaries of high investment return eras give up some of their gains to the less-lucky plan participants who happen to retire in low return eras. However, there is a question whether this theoretical welfare gain can ever be realized in practice. A game theory-based decision model would predict that the high investment return era beneficiaries will appropriate the balance sheet gains to themselves in the form of higher benefits and lower contributions. On the other hand, less-lucky low investment return era plan participants will try to push the economic pain of their shortfalls on to the next generation of plan participants. These game theory-based predictions square with actual DB plan stakeholder behavior over the course of the last 10 years.

So maybe DB plan survival is not the right question. Maybe the right question is under what conditions DB plans should be permitted to survive. Intergenerational fairness should surely be one of those conditions.

Essay # I

HUMAN FOIBLES AND AGENCY DYSFUNCTION:

BUILDING PENSION PLANS FOR THE REAL WORLD

"Underlying this global movement towards participant choice is an implicit assumption about behavior: That the employee-citizen is a well-informed economic agent who acts rationally to maximize self-interest."

Olivia Mitchell and Stephen Utkus
quoted from their book "Pension Design and Structure"

Getting the Questions Right First

Much has been spoken and written about pension design. Discussions usually revolve around the relative merits of 'DC vs. DB'. In other words, is it somehow better to define a contribution rate, invest the money, and see what pension it ends up buying 35 years later? Or is it better to define a target pension level 35 years hence, estimate what target contribution rate is needed to finance it, and then continue to adjust actual contributions over time until the target pension is eventually financed? Of course, anybody who knows pensions knows the answer to these questions: it depends.

Our goal in the next series of essays is to take this Question & Answer approach about pension design to a much higher level. Thus we intend to go well beyond such standard DC vs. DB juxta-positioning as:

- DB helps retain key long-service employees
- DC offers employees better portability
- DB offers greater pension benefit certainty
- DC is less risky for employers
- DB can be run as a profit center by employers
- DC benefits are more tangible, and hence valued more by employees

While these are all valid observations, they don't really go to the heart of the matter. A much more fundamental approach must start with questions such as: What should a pension arrangement attempt to accomplish? What critical considerations need to be taken into account in the design of an ideal pension arrangement? What does the resulting ideal design look like? How does this ideal design compare with the designs of today's 'real world' DC and DB pension plans? What barriers stand between 'actual' and moving to the 'ideal'? Can they be overcome? How?

Just as these questions go to the heart of the pension design matter, we believe that you will find the answers to them that follow do so as well.

Back to First Principles

A genuine new look at pension design requires going back to first principles. What should a pension design attempt to accomplish? Classical economic theory offers a good starting answer. The life-cycle model of individual economic behavior suggests people should try to optimize consumption over their lifetimes. For most, this means going into debt to acquire an education, shelter and consumer durables in early adulthood, paying down that debt and building up financial assets in mid-life, and turning those

financial assets into a stable stream of consumption expenditures during the retirement years.

This sensible life-cycle savings/consumption theory would be the end of it, except for the problem that real world people are generally not very good at turning this life-cycle savings/consumption theory into practice. Research suggests that there are two fundamental problems:

1. People have trouble living up to the rational life-time utility maximizer standard that economists and their theories have set for them; and,
2. Principal-agent and informational asymmetry problems combine to create a large potential intermediation wedge between individual savers and their money.

Taken together, research convincingly suggests that these two problems are serious enough to make a mockery of the proposition that classical life cycle savings/consumption theory offers the complete answer to the pension design question.

Human Foibles

The fact is that most people are not very good at solving the retirement savings problem on their own. People have difficulty keeping track of too many moving parts. Even rational experts have difficulty estimating their actual pattern of lifetime earnings, asset returns, taxes, longevity, and then deriving the optimal savings rate and investment policy from these projections. In addition, beyond these complex computational challenges lie important behavioral issues.

In their book *Pension Design and Structure*, Olivia Mitchell and Stephen Utkus (Oxford University Press, 2004) list six such issues:

1. Lack of Self-Control: Many people rationally understand the need to save for retirement, but are incapable of following through on their intention. So they constantly over-consume today and under-save for tomorrow. Why is this? One theory is that pro-active decision-making for most adults requires both cerebral and emotional elements, and that for most people a far-off event like retirement lacks the necessary emotional stimulus for immediate action.
2. Lack of Firm Preferences: Research shows that many people will answer the same question differently, depending on how it is asked. For example, enrolment in voluntary DC plans is much higher if employees are automatically enrolled with an option to opt out, than if they have to make a positive election to opt in.
3. Inertia and Procrastination: People tend to follow the path of least resistance in their decision-making. For example, after investment education seminars, a high proportion of participants say they are going to change their fund and asset allocations, but only a small proportion actually do.
4. Choice Overload: Research suggests that there is a negative relationship between the number of investment choices offered in DC plans and the plan participation rate. So ironically, plans that offer 10, 20 or even more investment choices do not serve their members as well as those that offer three clearly articulated, optimized choices.
5. Improper Inferences and/or Overconfidence: People tend to see patterns in random data, or simply rely on readily available data, rather than the right data. For example, fund or asset mix shifts are often made based on just a few years of good or bad historical performance.
6. Loss Aversion: Faced with the realization of a certain loss, many people will double-up in an attempt to recoup their investment. This aversion to realizing losses may explain why life annuities are so unpopular with many DC plan participants: they may die early and lose their bet with the insurer!

Clearly, many people are not the rational utility maximizers that classic economic theory assumes them to be.

Agency Issues

Adolph Berle and Gardiner Means set out the principal-agent problem clearly in their classic 1933 book *The Modern Corporation and Private Property*. Their fundamental question was *what happens to capitalism when you interpose a small group of agents i.e. management between the corporation and its owners i.e. a large group of diverse, remote shareholders?* Their answer was that these agents have the potential to extract significant rents from shareholders. Media reports tell us that what was true in 1933 continues to be true today. Without the active, countervailing force of good governance i.e., a knowledgeable, independent board of directors, many corporate managements continue to extract significant rents from their shareholders to this day.

Organizations which collect and invest the publics' retirement savings are not immune from the potential misalignment of interests between the managements of such organizations and their customers/beneficiaries. The mutual fund industry offers a classic example. It is largely made up of for-profit organizations selling the hope of good performance, packaged in many imaginative ways, to millions of individual investors around the world. These individual investors do not realize, nor are they told by the mutual fund industry, that there is an adding-up problem. Namely, that collectively, they will only earn market returns less costs. Unfortunately these costs can easily add up to 2.5% of assets annually i.e., sales costs, management costs, excess trading costs. Research shows that -2.5% is also a good estimate of the average annual amount by which mutual funds underperform their benchmarks. Prospectively, a 2.5% cost level probably exceeds any risk premium mutual fund investors could reasonably expect to earn in the future. While individual investors take the risk, the mutual fund industry gets the reward.

The client-adverse economics in the for-profit sector of organizations managing retirement savings contrast sharply with the client economics in the buyers' co-op sector. For example, the benchmarking firm *Cost Effectiveness Measurement Inc. (CEM)* has been collecting return and cost data on a large sample of DC pension plans of large American corporations (80 funds, median size $2 billion). The database shows a median total cost of 0.4% i.e., including both management and administrative fees/cost allocations. Further, the median benchmark-relative 5-year gross excess return for the sample was a positive 0.5%. Thus, in fact, plan participants as whole in this group of DC plans attained their benchmark performance for free over the 1999-2003 period.

Why do participants in the DC plans of large American corporations do so much better than the customers of the mutual fund industry? Because the executives managing DC plans and those managing mutual fund management companies have different objectives. There is a natural alignment between the interests of DC plan executives i.e., the agents, and DC plan members i.e., the principals: both the principals and the agents value good DC plan cost-effectiveness. This is not so in the mutual fund case. Here the managers have a (legal) option to extract wealth from their clients for their own benefit due to the informational asymmetry between them. In other words, mutual fund managers know more about what they are selling than their clients know about what they are buying. Mutual fund performance results suggest that many for-profit retirement savings managers choose to exercise this wealth-extraction option.

Implications for Pension Design

Can something be done to counteract this listing of human financial foibles and agency-related dysfunction? Of course! The observed human foibles can be counteracted by these three actions:

1. Exploit Inertia, Procrastination and Lack of Decision-Making Willpower: Automatically enroll all employees in the pension plan, and automatically set contribution rates at high-enough levels to produce reasonable income replacement rates on retirement.
2. Design a Simplified Investment Choice Menu: A complex menu of investment choices creates choice overload, leading to choice paralysis. Research suggests that choices should be limited to only three or four at most. Even here, an auto-pilot design is desirable. That is, the default option should be a small number of diversified, age-based portfolios, with risk exposures decreasing as age increases. Each of these portfolio choices could be dynamically managed through time to maximize net reward per unit of risk.
3. Emphasize the Reality of Longevity Risk after Retirement: Make annuitization the default choice on retirement, rather than the lump-sum withdrawal of the accumulated assets in the retirement savings account, as is currently the case. The auto-pilot default investment option could begin to acquire deferred annuities even before retirement.

What about agency-related dysfunction? Can it also be diffused? Yes, it can. Three specific strategies are (1) organize pension plans as arms-length co-ops managed solely in the best interests of plan participants, (2) emphasize good organization governance and management, and (3) build economies of scale to achieve low unit costs.

More to Come

The next section in the redesigning pension plans story will elaborate on how these three strategies can jointly neutralize the negative organizational effects of agency issues. From there, we will link the three auto-pilot savings/investment rules set out above, and the three agency effects-neutralization strategies into a new, integrated pension model that we will call the *Efficient Personal Pension Accumulation Model (EPPAM).*

By design, *EPPAM* pension plans address the behavioral and agency issues described earlier. That leaves one more critical question to be answered. Relative to this *EPPAM* benchmark, can shared-risk pension models (i.e., DB plans) offer superior pension plan stakeholder outcomes? That will be the subject of the third and final part of this ground-breaking series on redesigning pension plans.

Essay #2

BUILDING PENSION PLANS FOR THE REAL WORLD:

THE EFFICIENT PERSONAL PENSION ACCUMULATION MODEL

*"**Model**: a simplified description of a system or process to enhance understanding"*

The Oxford Dictionary

Human Foibles and Agency Dysfunction

The previous section set out two compelling reasons why most people should not be left to their own devices to build a post-retirement income stream:

1. Human Foibles: Most people are perfectly rational in their decision-making as long as the decision context is familiar. Unfortunately, retirement planning issues such as income replacement target, required savings rate, investment choices, time horizon, expected return, and risk appetite are decidedly unfamiliar territory for most people. So now, many exhibit a lack of firm preferences, inertia and procrastination, a lack of self-control, and an irrational aversion to realizing losses. The results are dysfunctional (non?)-decision processes from the perspective of building adequate post-retirement income streams in the future.
2. Agency Issues: Just as it is not reasonable for people to build their own cars, it is also not reasonable for them to build their own pension vehicles. In the case of cars, a small number of global corporations compete for market share by offering 'bundles' of quality, choice, price, and convenience. The car market is highly competitive and efficient because most buyers are knowledgeable enough to choose the optimal quality/choice/price/convenience transportation bundle for them. What about the market for pension vehicles? Is it also highly competitive and efficient? No, it is not. Why? For two reasons. First, there is the 'human foibles' problem. In other words, people are in unfamiliar territory when making pension-related decisions. The second reason is that pension vehicle suppliers know this to be the case, providing them the opportunity to charge more for their products and services than they are really worth. When the pension vehicle supplier is a 'for profit' organization, this informational asymmetry problem easily translates into a wealth-transfer process from the retirement savings principals to the intermediary agents.

So what can be done to counteract these two fundamental impediments to the generation of adequate post-retirement income streams for most people? Our answer is the *Efficient Personal Pension Accumulation Model (EPPAM).* The goal of this section is to unveil it. We do so by identifying three 'auto-pilot' strategies to help keep people on rational decision tracks, and three organizational strategies to help minimize agency costs. This section ends with a discussion of the implications of our proposed *EPPAM* blueprint for the employer community, for public policy, and for the future of defined benefit (DB) plans.

Counteracting Human Foibles

Actually, the unveiling of *EPPAM* started in the first section by proposing three key strategies to counteract the human foibles which have now been well-documented through studies in the burgeoning field of behavioral finance. The following is a re-cap of these three key strategies:

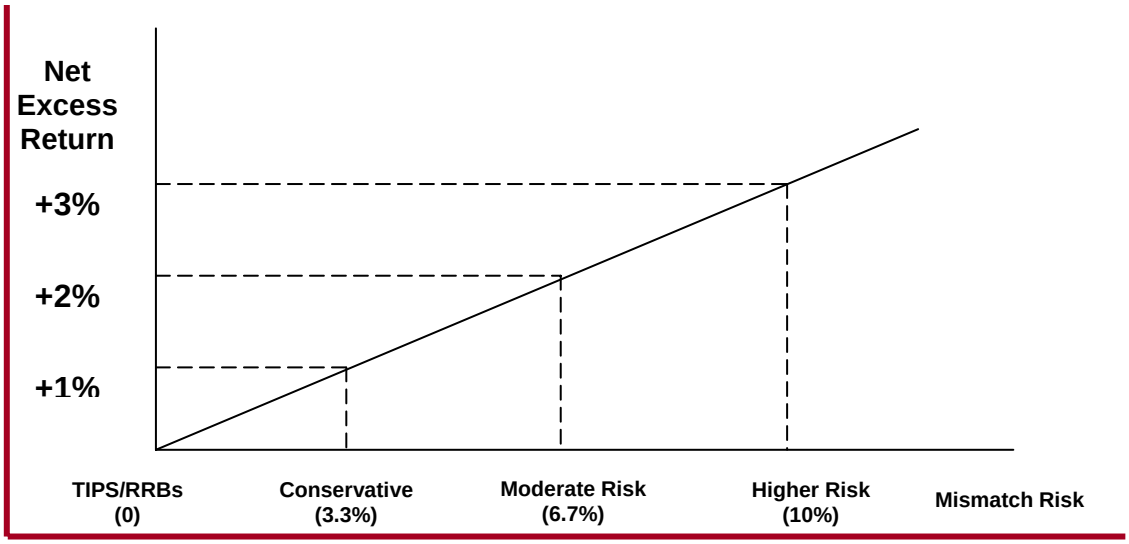
1. Exploit Inertia, Procrastination, and Lack of Decision-Making Willpower: Automatically enroll all employees in the pension plan, and automatically set contribution rates at high-enough levels to produce reasonable income replacement rates on retirement.

2. Design a Simple Auto-Pilot Investment Program: A complex menu of investment choices creates choice overload, leading to choice paralysis. Research suggests that choices should be limited to only three or four at most. Even here, an auto-pilot design is desirable. That is, the default option should be a small number of diversified, age-based portfolios, with risk exposures decreasing as age increases. Each of these portfolio choices could be dynamically managed through time to maximize net reward per unit of risk.
3. Emphasize the Reality of Longevity Risk after Retirement: Make annuitization the default choice upon retirement, rather than the lump-sum withdrawal of the accumulated assets in the retirement savings account, as is currently the case. The auto-pilot default investment option could begin to acquire deferred annuities even before retirement.

Here are some further thoughts on these three strategies:

1. Exploit Inertia, Procrastination, and Lack of Decision-Making Willpower: People need to know that, assuming a realistic net return, it takes a 20% of pay contribution rate over a full working life to replace 70% of final earnings on an inflation-indexed basis. Of course, for lower income earners, the 9.9% CPP/QPP contribution rate on earnings up to $40K can make up a significant part of the target 20% contribution rate. The point is that the setting of the automatic pension plan contribution rate should be explicitly tied to a target income replacement rate and a target net return on assets.
2. Design a Simple Auto-Pilot Investment Program: Figure 1 sets out the key elements of what we have in mind. Younger people with lots of human capital and little financial capital start out in the higher risk investment option. Over their working lives, they automatically move down the risk scale (i.e., to the left on the horizontal axis), eventually ending up with a life annuity on retirement. The higher, moderate, and lower risk strategies are optimized over time through a professional investment process. More on that below. The net excess return targets for the three strategies are always in relation to the prevailing yields on RRBs of appropriate duration. So today, with long RRBs yielding 2%, the net real return targets for the higher, moderate, and lower risk strategies are 5%, 4%, and 3% respectively. The 'risk budgets' for the three strategies are expressed as mismatch risk volatilities versus the RRB portfolio.

Figure 1 A Simple Auto-Pilot Investment Program



3. Emphasize the Reality of Longevity Risk after Retirement: The concept of pooling of mortality/longevity risk has been around a long time. It is automatically embedded in DB pension plans. It should also be embedded in the *EPPAM* design.

With this pension design in mind, we now turn to the question of *EPPAM's* organization design.

Minimizing Agency Costs

Minimizing agency costs also involves the implementation of three strategies:

1. Create Single Purpose Pension Co-Ops: The previous section provided evidence of an annualized net excess return gap of 2.5% between a broad sample of U.S. mutual funds and the 80 large employer sponsored DC pension plans that provide return and cost data to the *Cost Effectiveness Measurement Inc. (CEM)* database. We attribute this performance gap (in favor of the DC plans) largely to the agency costs associated with for-profit mutual fund companies managing the financial assets of a clientele that is in the main financially unsophisticated. Such companies have two conflicting goals: to produce good returns for the clients and to produce good profits for the owners of the mutual fund company. In contrast, most large employer-sponsored DC plans have only a single purpose: to facilitate the accumulation of pension wealth as cost-effectively as possible.

2. Foster Good Governance and Organization Design: Minimizing the potential for conflicting interests that can materially reduce the returns of *EPPAM* participants is not enough. Steps must also be taken to ensure that the *EPPAM* organization is well-governed and managed. Research has found an excess return gap of 1% per annum between well- and poorly-governed pension funds. Key is the composition of the board of trustees. The board should have the requisite collective skills/experience set. Each of its members should value the work, be collegial, and be capable of thinking strategically. A board with these characteristics will create the context for the organization to successfully carry out its mission.
3. Build Economies of Scale: The most certain path to enhanced financial wealth creation is to reduce unit costs, as long as such reductions do not impair the ability of the organization to operate effectively. Research from the *CEM* database suggests that every 10-fold increase in asset size reduces unit costs (and increases net returns) by 0.2% per annum. So, for example, the findings imply that all other things equal, $5B pension funds enjoy an average 0.4% per annum return advantage over $50M pension funds. Of course, all other things are typically not equal between $5B and $50M pension funds. Most importantly, the board of trustees of the $5B fund can afford to hire a qualified CEO to whom it can delegate the development and implementation of a fund strategic plan. The board of the $50M fund, on the other hand, can't afford that luxury. Thus large funds do not only enjoy a cost advantage, but a management advantage, too.

This *EPPAM* blueprint has major implications for the employer community, for public policy, and for the future of DB plans. Some thoughts on each topic follow.

***EPPAMs*, Employers, and Public Policy**

We start with the premise that employees who participate in clearly understood retirement income arrangements are more productive than those who don't. (There is an interesting causality question here: do these arrangements increase productivity, or do more productive people seek out employers that offer such arrangements?). An important related factor is that effective retirement income arrangements facilitate the transition of older workers out of employment into retirement. We also note that about 40% of the Canadian workforce is currently covered by some form of a workplace-based pension arrangement. Most of that coverage is in the public sector workforce, in the unionized part of the private sector, and among large corporate employers. By implication, people working for smaller private sector employers are largely uncovered, although provisions for Group RRSPs have bridged some of this gap.

Given the above, it follows that being able to offer membership in an *EPPAM* arrangement would be a 'good thing' for employers that currently do not offer any kind of retirement income arrangement to their employees. An important caveat is that these employers would not incur material additional financial or legal obligations. What about employers already providing employees access to a pension arrangement? What would shifting to an *EPPAM* arrangement do for them? We see two advantages: (1) *EPPAMs* will generate materially higher, more predictable pensions than most current DC pension plans or Group RRSPs for the reasons set out above, and (2) there is no need for an employer to be the direct legal sponsor of the *EPPAM* arrangement, thus eliminating current legal concerns surrounding the sponsorship of DC plans.

Do the merits we attach to *EPPAM* arrangements play out in practice? In the USA, we can point to the venerable national pension plan for college and research workers: TIAA-CREF. Founded through an initiative by Andrew Carnegie, it has operated successfully since 1917. It currently covers about two million workers and pensioners with collective assets of over $300 billion. In Australia, the entire workplace pension system has been moving towards *EPPAM* structures since membership in a workplace pension plan was made mandatory in 1992.

We see two major socio-economic benefits arising out of broad workforce coverage in *EPPAM* pension arrangements. First, raising workplace pension coverage well above the current 40% level offers the possibility of material productivity gains and reduces future dependence on the public purse to provide income support for people with inadequate levels of retirement income. Second, *EPPAM* structures are ideally suited to facilitate the dispassionate investment of long horizon retirement savings. Investment processes based on such a foundation offer the prospect of more effective corporate ownership behavior. This in turn leads to the prospect of reducing agency costs at the corporate level and increasing the productive allocation of financial capital across the global economy.

EPPAMs and DB Plans

EPPAMs are neither DC plans nor DB plans as these arrangements are currently operated. They are clearly superior retirement income generation vehicles to most current DC plans for the reasons set out above. What about versus DB plans? Are *EPPAMs* superior to current DB plans too? That depends on the value we attach to intergenerational risk sharing. While intergenerational risk sharing would seem to be a worthy goal in principle, can it be implemented fairly in practice? That is the ultimate question defenders of DB plans must successfully address if DB plans are to have a future. We address this question in the next section.

Essay #3

DB PLANS AND BAD SCIENCE

"Science has made little progress dealing with whole systems.
It tends to become arrested in the stage of singling out isolated bits, with little grasp of how these interact with other bits of integrated systems…"

Jane Jacobs
from "Dark Age Ahead"

Science and the Design of Pension Contracts

In her new book "Dark Age Ahead", Jane Jacobs reminds us that bad science leads to bad outcomes. Specifically, the legendary chronicler of the life and death of North American cities shows how bad research in the fields of traffic engineering, public health practices, and the economics of urban development has led to bad policy and design decisions in each of these fields.

What about policy and design decisions in the pensions field? Are they based on good science-based research? Or are they based on bad science too? And if they are, what are the consequences? As it pursues the answers to these questions, this section ends up concluding that DB-based pension contracts contain a serious, potentially fatal, design flaw. This design flaw poses a serious, potentially fatal, threat to the sustainability of DB plans. Can the flaw be fixed? We invite you to reach your own conclusion after you study the logic presented below.

The *EPPAM* Contract

The prior sections developed the *Efficient Personal Pension Accumulation Model (EPPAM)* from first principles. Its design is based on sound theory and sound research. It starts with the premise that rational individuals wish to devise life-time consumption plans that maximize life-time utility or satisfaction. Two types of barriers stand in the way of achieving this goal. First, devising such a plan is a highly complex undertaking, leading most people left to their own devices to either make highly sub-optimal decisions or simply ignore the problem all together. Second, getting expert help with pensions-related planning, investing, and administration brings its own set of agency-related problems, leading to the prospect that people will end up 'paying too much for too little'.

The *EPPAM* arrangement addresses both types of barriers. The knowledge/behavioral problems are addressed by an 'auto-pilot' savings, investment, and annuitization protocol. This protocol aligns income replacement targets with target savings rates and optimal investment/annuitization policies. The agency problems are addressed through the establishment of single purpose pension 'co-ops' of sufficient scale to be able to operate these 'auto-pilot' savings/investment protocols at low unit costs.

Taking on Investment Risk: Implications

The life-cycle savings/investment theory underlying *EPPAM* does not require the undertaking of investment risk during the capital accumulation phase. In other words, the theory is valid even with all retirement savers choosing risk-free investment policies. Justification for undertaking investment risk requires two conditions: (1) the *EPPAM* participant has the requisite tolerance for risk-taking; and (2) the *EPPAM* organization's investment team is able to construct a series of investment portfolios with the requisite net reward/risk ratios through time.

Unfortunately, these two conditions do not guarantee that all *EPPAM* participants undertaking investment risk will end up with higher pensions than those who do not. Some will likely end up with lower pensions than could have been generated by adopting the risk-free investment policy. This would be the case even

if all *EPPAM* participants stayed with the same set of auto-pilot savings/investment rules. Why? Because capital market returns are not constant over time. There will be extended high real return periods, and there will also be low return periods. Thus even the most expert *EPPAM* investment team in the world would be challenged to provide the same real returns for the plan participants who happen to retire near the end of a high return regime, and those retiring near the end of a low return regime. This reality raises an important question. Is there a way for *EPPAM* participants to insure against this type of investment regime risk?

Is Investment Regime Risk Insurable?

In principle, *EPPAM* participants could ban together and agree that at least some of the high return regime gains be used to supplement the pensions of *EPPAM* participants retiring in low return regimes. The assumption of risk-aversion suggests that in principle this type of insurance is a good idea for everybody. How could this intergenerational insurance concept be put into practice? This question is best answered through a thought-experiment. Imagine the following series of events:

- Knowledgeable representatives of the current and future generations of participants of an *EPPAM*-based plan meet to negotiate an intergenerational pension insurance deal deemed to be fair for all.
- They agree on the economy's long term wealth-creating potential, the expected term-structure of risk-free investment returns, and the expected long term cost of risk capital (i.e., the expected premium for taking on investment risk). They also agree on the potential intergenerational variance around these long term expectations.
- Next, using the agreed-on long term expectations, they calculate the expected normal pension of an *EPPAM* participant who follows the plan's auto-pilot savings/investment rules. They also calculate the potential intergenerational pension variance around the expected auto-pilot pension, as well as what this normal pension would cost if a risk-free investment policy is followed.
- The expected auto-pilot *EPPAM* pension leads to a 70% final earnings replacement with full inflation indexation, with a 35-year contribution rate of 15% of pay. The low-return regime outcome produces only a 40% earnings replacement, while the high-return regime outcome produces a 100% replacement. Finally, a 70% replacement pension can be earned on a risk-free basis with a 30% of pay contribution rate.

These analyses lead to the visualization of three possible outcomes for Generation #1 after a 35-year accumulation period: (1) the accumulated assets are indeed sufficient to buy an inflation-indexed annuity replacing 70% of final earnings, (2) the accumulated assets are sufficient to buy 100% replacement; and, (3) the accumulated assets can buy only a 40% replacement pension. These prospects raise the following critical questions: How much does Generation #2 have to be compensated in order to underwrite the risk that there are insufficient assets at the end of Generation #1s accumulation period to buy the normal 70% replacement rate pension? Or, in other words, what kind of insurance premium does Generation #2 have to be paid to underwrite Generation #1's shortfall risk?

Intergenerational Bargaining

Now the bargaining begins. Generation #1's negotiator makes the first offer: Generation #1 will forego all the upside if Generation #2 underwrites all the downside. Generation #2's negotiator responds that a deal based on this offer would mean that Generation #1 would get the normal pension which costs 30% of pay on a risk-free basis for only 15% of pay, but without taking any risk. Generation #2 would have to be risk-neutral rather than risk-averse in order to accept this offer. This is not a defensible stance for Generation #2's negotiator to take, although the specific degree of risk aversion to assume is a very difficult assessment to make. So the offer is turned down.

Generation #1's negotiator now realizes the following: in order for Generation #2 to underwrite any of Generation #1's shortfall risk, Generation #1 has to give up more than just the upside in case of a high return regime outcome. In addition, Generation #1 will either have to contribute more than the normal 15% of pay during its 35-year accumulation period, accept less than the normal 70% replacement rate pension in case of a low return regime outcome, or do a combination of the two. After a few more rounds of bargaining, the deal is struck. For agreeing to underwrite half of the estimated low return regime risk, Generation #2 is promised that Generation #1 will: contribute 20% of pay rather than 15%, give up all of the upside in case of a high return regime outcome; and, accept a 60% replacement rate pension in case of a low return regime outcome.

This thought-experiment has produced four important conclusions:

1. Investment regime risk is indeed potentially insurable up to a point.

2. If the current generation imposes investment regime risk on following generations, these following generations should receive fair compensation for undertaking this burden.

3. Deals fair to following generations are unlikely to be struck unless a bargaining agent representing their interests is present at the bargaining table (Woody Brock also makes this point in his February SED Report).

4. Even if a fair deal is struck, the question of its future enforceability remains.

Robust Course-Correction Mechanisms Required

Seen through the prism of our thought-experiment, this *shared investment risk pension accumulation model* (i.e., DB plan) is a natural extension of the *efficient personal pension accumulation model* (*EPPAM*) set out in the previous section. From the individual participant perspective, the auto-pilot savings/investment approach remains in DB plans in the sense that they are not directly involved in contribution rate/investment policy decisions. Organizationally, the arms-length, well-governed pension co-op with sufficient scale to be cost-effective also remains. Even the aggregated investment policy of all the *EPPAM* participants taken together might not be very different from the normal investment policy of the collective DB model.

So what is different in the DB model? Pension co-ops operating DB plans need effective course-correction mechanisms to remain sustainable. This means that when actual investment experience moves plan assets materially above or below their target value, the pension deal must trigger some pre-determined, fair combination of changes in contributions, changes in benefits, and changes in investment policy to return the plan to a sustainable trajectory. Research shows course-correction packages must be aggressive in order to maintain plan sustainability, implying simultaneous adjustments in contribution rates, benefit levels, and risk budgets may be needed.

This need for effective and fair course correction mechanisms is the Achilles heel of most of today's public sector and industry DB pension plans. Most of the mechanisms we see in use today simply cannot pass the pre-determined, effective and fair test. Instead, they are usually ad hoc, ineffective, and unfair. Corporate DB plans suffer from the further complication that the finances of the corporation and of the pension plan are intertwined. The existence of pension benefit insurance in case of insolvency creates an additional layer of complexity. Now the financial interests of the current generation of plan members, bond holders, shareholders, corporate managers, and pension guarantors can often not be resolved, let alone those of following generations.

The Flawed DB Model

The potential welfare/utility gains attached to generating pensions through *EPPAM* arrangements are likely to be highly material for most people. The solid research results on the dysfunctional financial behavioral of individuals, and on material agency costs, offer persuasive evidence that participants in *EPPAM* arrangements will easily end up with twice or three times the pension payments that people might generate if left to their own savings and investment devices.

Relative to this research-based *EPPAM* standard, will moving to a risk-sharing DB arrangement result in further clear welfare/utility gains? The logic of this section suggests the answer is possibly in theory, but not likely in practice. For example, current DB deals have been struck without the involvement of bargaining agents representing the interests of future generations. As a result, DB-based pension contracts unfairly favor current generations at the expense of future generations. Research further suggests that current course-correction mechanisms are not vigorous enough to maintain long term DB plan sustainability when faced with material adverse experience. Finally, in a corporate context, the potential conflicting interests of current plan members, bond holders, shareholders, management and pension guarantors add additional sources of game theory-driven moves by bargaining groups to extract wealth from, and shift losses to weaker stakeholder groups.

So we conclude that relative to the *EPPAM* standard, as a practical matter, DB plans do not enhance the aggregate welfare/utility of stakeholder groups, but merely redistribute it from stakeholder groups in the weakest bargaining positions to those in the strongest positions. This is the serious, potentially fatal, flaw in DB plans we spoke of on the front page of this section.

Bad Science

A final question. Why has it taken us so long to reach so fundamental a conclusion about pension contracts that involve shared risks between various stakeholder groups? Our short answer is: bad science. In other words, many of us have gone along with the proposition that collective risk-sharing in pension arrangements is a ‘good thing’ without examining whether the proposition stands up to the hard, bright light of logic and science. We have permitted the actuarial and accounting professions to tell us how to manage and account for DB arrangements without really thinking through the underlying economics. Rephrasing Jane Jacobs, we have “become arrested in the stage of singling out isolated bits of pension systems, with little grasp of how they interact with the other bits”. Mea culpa.

Rotman

DB Plans Under Siege: Can They Survive?

Pension Plan Design, Risk and Sustainability Workshop

International Centre for Pension Management
Rotman School, University of Toronto

Keith Ambachtsheer

May 31, 2005

Joseph L. Rotman School of Management
University of Toronto

The *Utility* of Pensions

THE PERSONAL QUEST:
Maximize Utility of Lifetime Consumption

Build Intellectual Capital → **Build Financial Capital** → **Spend Financial Capital**

Two Barriers to Lifetime Consumption Utility Maximization

1. Bounded rationality leads to personal decision dysfunction

2. Principal-agent and informational asymmetry problems drive wedge between retirement savers and their money

Human Foibles

Six Human Foibles

1. Lack of self-control
2. Lack of firm preferences
3. Inertia and procrastination
4. Choice overload
5. Improper inferences and/or overconfidence
6. Loss aversion

Agency Cost Estimates

- Equity mutual fund next excess returns -2.5% *
- DB pension fund net excess returns +0.1% **
- DC pension fund net excess returns +0.1% ***

* All Lipper U.S. equity categories, 1994-2003

** All DB pension funds in CEM database, 1994-2003

*** All DC pension funds in CEM database, 1999-2003

The *EPPAM* Solution

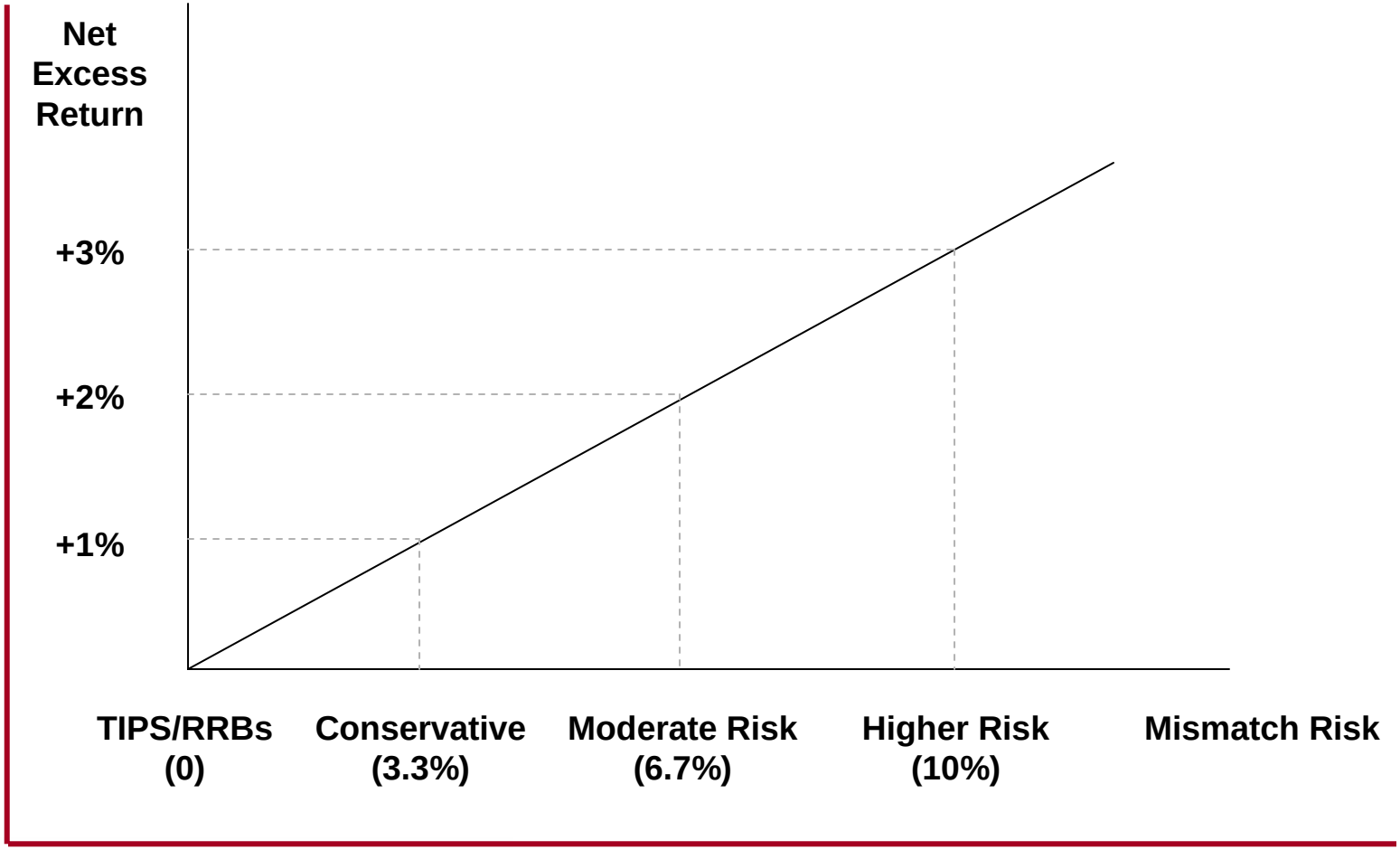
Addressing Human Foibles

- Automatic enrolment and set minimum contribution rate
- Design auto-pilot savings-investment process
- Design auto-pilot conversion of financial capital into life annuities

Addressing Agency Costs

- Create single-purpose pension co-ops
- Foster good governance and organization design
- Build economies of scale

Integrative Investment Model



Investment Beliefs

1. Is the ERP *IID*?
2. To what degree can expert management modify a pension co-op's ex ante reward/risk prospects?
3. Are expert pension co-ops the ideal *owners* of society's means of production?
4. How much investment regime risk remains, even with the application of optimal *EPPAM* rules?

Buying Investment Regime Risk Insurance: A Thought Experiment

- Investment regime risk insurance is *utility*-enhancing, in principle
- But it must be priced properly
- Assume the following:

***EPPAM* Expectations for Generation #1**

Scenarios	Contribution Rate	Income Replacement Rate
Good risky outcome (p=0.25)	15%	100%
Expected risky outcome (p=0.5)	15%	70%
Bad risky outcome (p=0.25)	15%	40%
Certain outcome (p=1.0)	30%	70%

Buying Investment Regime Risk Insurance: A Thought Experiment (cont'd)

Questions

1. How much of Generation#1's Replacement Rate Risk is Generation#2 prepared to underwrite?

2. How should the *insurance premium* be established?

Buying Investment Regime Risk Insurance: A Thought Experiment (cont'd)

Answers

1. If Generation#2 simply accepts the upside, in return for underwriting the downside, Generation#1 gets a free ride

2. A fair contract would not only see Generation#2 get all the upside, but would also see Generation#1

   a) Contribution more than 15% of pay
   b) Accept less than a 70% pension in the *Bad Outcome*
   c) Accept some combination of a) and b)

Implications for DB Plans

- Relative to *EPPAM*, the only rationale for DB Plans is investment regime risk insurance
- This risk is indeed insurable up to a point, in principle
- Underwriters of investment regime risk in DB Plans should be fairly compensated
- Fair *deals* are unlikely to be struck without explicit bargaining representation on behalf of future generations

Implications for DB Plans (cont'd)

- In practice, *fairness* will have to be assessed dynamically as DB balance sheets move into surplus or deficit over time, and as the demographics of plan membership changes.

- In practice, only a combination of enlightened legislation and regulation, as well as pension co-op in-house expertise, offer any hope of sustaining DB Pension Plans that can meet the dual criteria of fairness and continuity

Implications for DB Plans (cont'd)

- Current DB plan perceptions, at least in North America, are so far away from these realities that it is difficult to be optimistic about the future of DB pension arrangements that are generally mature and under-funded