Title: Retirement 20/20 Measurement Framework

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Note: this paper draws extensively from a previous work by the author, "Constructing New Retirement Systems: Choosing between Insurance and Investment, Choice and Default" presented at the Pension Research Council Symposium, 30 April – 1 May 2009.

Overview

This paper will focus on the development of the Society of Actuaries' Measurement Framework. The SOA Pension Section developed the Measurement Framework tool as part of its *Retirement 20/20* (R20/20) project to evaluate strengths and weaknesses of current and proposed pension designs. The Measurement Framework (Framework) is based on the needs, risks and roles of the four key stakeholders (as defined within R20/20*)*. The objective of the Framework is to apply a systematic evaluation of key design features, based on how well a retirement plan design meets stakeholders' needs and risks, as a way to evaluate the strengths and weakness of that design. In particular, the Framework ascertains how designs are better able to meet the needs and risks of some stakeholders versus others, and can help determine where design and governance structure are weak and the plan can be mismanaged by stakeholders (in this context, mismanagement refers to any situation where stakeholders can achieve sub-optimal outcomes for themselves or other stakeholders).

The Framework evaluates between six to eleven characteristics or criteria for each of four stakeholders (individuals, society, employers and markets). Each criterion is rated before and after the effects of moral hazard. Individual criteria ratings are averaged to provide an overall rating as to how well the Framework meets the needs and risks of that stakeholder. Because stakeholders often have competing needs, and design choices often specific which stakeholders bear what risk, no design would be expected to rate perfectly across all stakeholders. As such, the Framework can highlight choices made in Tier II[1] structures, and elucidate how these choices can complement or exacerbate flaws in other parts of the retirement system.

We tested the Measurement Framework by evaluating a private-employer US defined benefit plan (DB), a private-employer US defined contribution plan (DC), the Ontario Teachers' Pension Plan (OTPP), the Clergy Retirement Security Program (DB) of the United Methodist Church (UMC), and the Dutch industry wide defined benefit schemes (Dutch). DB and DC represent the two designs most prevalent in the US (and Canada). The other three designs – OTPP, UMC and Dutch – are referred to as "non-traditional designs" because their designs are not typical for the US or Canadian context. Specifically, while they retain elements of the traditional defined benefit plan, they are not employer-sponsored and share risk among participants in different

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[1] Throughout this paper, "Tier II" will refer to privately funded and managed schemes (defined benefit or defined contribution) designed to work in combination with social insurance (Tier I) and private savings (Tier III). This terminology follows (with some adaptations) the original three-pillar scheme as defined in *Averting the Old Age Crisis* (World Bank, 1994).

ways. Evaluating DB and DC designs tested the Framework's completeness because these designs, and their shortcomings, are well understood. The other designs are (seen as) innovative variations on traditional defined benefit and defined contribution designs, and were used to test how well the Framework evaluated less traditional designs.

In developing the Framework, we learned several lessons. In analyzing the traditional DB and DC plans, we recognized that a good design could be sabotaged by a stakeholder acting sub-optimally or in ways that preserve other interests at the expense of the plan. All of these actions are loosely termed "moral hazard" within our Framework. The preliminary analysis of these non-traditional plans highlighted some principles for successful retirement design: strong governance structure , alignment of roles with skills, presence of well-defined self-adjusting mechanisms (to share risk among stakeholders), solidarity among plan participants, a degree of independence from employer, use of groups, and use of nearly default free discount rates for measurement. Some of these principles (strong governance) are well understood and some are still being evaluated (self-adjusting mechanisms) for their potential usefulness. And, some of these principles may not be usable outside of these non-traditional formats (these plans are designed to meet the particular needs of their employers and participants; these conditions may not be widely duplicated).

R20/20 has considered new retirement systems for the US and Canada. While there are differences in the social insurance framework, and private employer sponsored defined benefit programs are more prevalent in Canada than in the US (where defined contribution programs have become more prevalent), the systems are similar enough that we have been able to consider future designs for both countries simultaneously. In this paper "North America" will refer to the US and Canada.

R20/20 focuses solely on retirement income systems; it does not consider health care or long-term care. Finally, R20/20 focuses on tier II income, and excludes social insurance, welfare, private savings, familial support, and other forms of assistance.

About Retirement 20/20

R20/20 is an initiative of the Society of Actuaries' Pension Section Council to develop new retirement systems that extend beyond the employer sponsored defined benefit/defined contribution paradigm that exists today in the US and Canada. Initial work on the initiative began in late 2005. R20/20 has brought actuaries together with attorneys, economists, employers and other public policy experts from the US and Canada to systematically explore the fundamental characteristics of a new retirement system. When the initiative started, it was broadly focused to consider the role of social insurance, employer vehicles (Tier II) and private savings. As it has evolved, it has focused on new vehicles for Tier II. Over three conferences, participants have discussed the role of social insurance and have reaffirmed the design of existing social insurance systems in the US and Canada as the base upon which to build new Tier II designs. The current phase of the process is a call for models for new Tier II systems. Eighteen authors submitted papers which are currently being evaluated; the best models are to be presented at conferences in the US and Canada in second quarter of 2010.

Construction of the Measurement Framework

The Framework is a tool to evaluate current and new retirement designs to determine how they focus on stakeholders. The Framework was developed so we could test how well new (unknown) designs met the principles for new retirement systems defined within R20/20. R20/20's premise has been that we can better design retirement systems if we understand the needs, risks and roles of stakeholders within that system. The tool tests whether the design aspects meet the needs and risks for each stakeholder, and whether this design suited the stakeholder's role.

The first R 20/20 conference focused specifically on defining the needs, risks and roles for these four key stakeholders:

- **Society** includes current and future taxpayers. Society has a stake in the success of the system because retirees with inadequate retirement income will require more resources from taxpayers (either individually as family members supporting relatives or collectively as taxpayers providing additional social insurance and welfare payments). Society's goal is to ensure the highest number of individuals have an adequate and secure retirement. The government (politicians) is the agent of taxpayers.
- **Individuals** are those who must secure income for retirement. They face various retirement income risks in retirement and need to find ways to hedge, pool, or bear those risks in retirement. R20/20 has focused on middle-income individuals. Those who are very poor depend on existing social insurance and welfare programs. Those who are very wealthy, at least in theory, need not face poverty (they have sufficient wealth to allow them to hedge their own retirement risks).
- **Employers** have a central interest in retirement because of the need to attract, retain and then eventually retire workers. We have focused on the employer as stakeholder in terms of its needs to manage workforce and manage its risk. Historically, the employer has also played a central role in the retirement system in US and Canada.
- **Markets** are defined as both the capital markets in which retirement wealth is accumulated (and converted into income) and those third party intermediaries (e.g. insurers) who focus on providing retirement wealth products. The markets are not strictly a stakeholder (they have no needs or risks in the system). However, a successful retirement system appropriately uses market mechanisms, including hedging and investment vehicles. Therefore, we have designated markets as a stakeholder so as to focus on this critical function.

From this initial conference, as well as work done later, the Framework was developed with characteristics for each stakeholder. The Framework currently has 36 characteristics for the four stakeholders: society (10 characteristics), individuals (11 characteristics), employers (9 characteristics) and markets (6 characteristics). Tables I - IV shows the characteristics and their definitions.

<u>Use of color ratings</u>

Each characteristic, or criterion, is assigned a rating on a red-yellow-green scale. There are five color choices: green, yellow-green, yellow, red-yellow and red. The green rating is highest, suggesting that the plan does as well as can be expected in meeting that need or risk, while a red rating suggests the plan does extremely poorly in meeting that need or risk. A team of actuaries and other retirement professionals assign ratings.

We have explicitly assigned a color rating, rather than a numerical rating, for several reasons. First, these are qualitative rather than quantitative assessments. A "green" rating and a numerical rating of "5" are not equivalent. A "5" rating implies perfection; a green rating implies that the design does very well in meeting this need, but not perfection. Second, gradations in a color scale allow one to show where there are flaws, but not try to ascertain precisely the degree of the flaw(s). A "yellow-green" rating, for example, implies that the plan does well – but not perfectly – in meeting that criterion. There is a noticeable flaw. On a numerical scale, would that be a rating of 4.0, 4.2, or 3.8 (or something in between)? The rating assessment is not done at a fine enough level to be able to ascertain these differences. Finally, the average of a numerical rating provides perception of a more precise assessment than the assignment of the equivalent color value. Two plans with similar average ratings of "red-yellow" would both be seen as significantly flawed in meeting the needs of the stakeholder. It is not material, for purposes of the Framework, which design is more flawed (again, whether the rating is a 1.8 or 2.2). The better analysis is to consider where those flaws lie (which individual criteria had the lowest rankings) to determine the suitability of the design. Finally, the color ratings allow for an easier visual assessment and comparison of plans.

The ratings for individual criteria are combined to create composite rating for each stakeholder. The composite rating can blur differences between plans (a plan with half red and half green can score yellow in the composite rating, as can a plan with mostly yellow ratings), so the Framework shows color lines in addition to the summary rating to show the degree of variation in the ratings across all needs and risks for that stakeholder. The color line helps the user focus on where the design has significant flaws for a particular stakeholder (red-yellow or red ratings on individual criteria).

<u>Moral hazard</u>

In addition to baseline ratings, each characteristic is rated after considering the effect of moral hazard. A plan can be designed with one intention, but the actions of agents or misunderstandings of stakeholders can lead to different (negative) outcomes. For example, plans that pay benefits in the form of annuities score highly for individuals along the "guaranteed income" criteria; the presence of a lump sum option represents a moral hazard for the individual, which would lower that score. In this case, the lump sum acts as a moral hazard, encouraging the individual to forego the guaranteed income protection. Employers as plan sponsors often face moral hazard because the employers primary concern is the operation of the business, rather than the operation of the plan. This can encourage the employer to take actions that are for the betterment of the business, but may not be in the best interests of the plan.

Moral hazard typically takes the following forms:

- For society, moral hazard often comes from regulators and politicians using the system for political ends (including revenue generation). Other examples occur when plan design puts certain population groups at too much risk, or a design creates too much inherent risk for future generations.

- For individuals, moral hazard often comes when individuals can make choices that work against their own interests or the plan design allows use of money for other purposes. In our evaluation of moral hazard, a feature that can benefit a few individuals but causes many individuals to make poor choices would be seen as a moral hazard, because the benefit to the few is outweighed by the poor outcome for the many. Lump sum payments are a classic example.
- For employers, sponsorship of the plan creates many moral hazards (the employer may make choices to benefit the business that put the plan in danger). There is also the classic definition of moral hazard wherein managers can operate the plan in their interests, which may not ally with those of owners or participants.
- For markets, moral hazard can come when plan agents, generally those in charge of investments, can act to take risk in the plan that is not in the best interest of the participants or when the governance or reporting structures (including cost accounting) do not encourage use of market hedging instruments.

For each individual criterion, ratings are developed before and after moral hazard. The summary page shows the color line ratings before and after moral hazard. Generally, a rating slips only one level for moral hazard. In some cases, moral hazard is not considered significant, so there is no change for the individual crtierion's rating. Ratings are the same if the risk is already borne by that stakeholder (the rating is already red-yellow or red) or if the plan's governance structure is such that stakeholders or agents acting on behalf of stakeholders cannot take action that creates sub-optimal outcomes.

Results from Measurement Frameworks Completed

We have attached, as Appendix I – V, completed the Measurement Framework for DB, DC, Dutch, OTPP and UMC plans. These are still in draft format, although they are scheduled to be released in 2010. Each Framework contains a summary of the plan provisions on page 1, as well as an evaluation of the plan based on the 36 criteria.

In general, plans that do well for individuals tend to do well for society (and vice versa). If individuals who are well protected, individually, against retirement risk then society as a whole need not step in to offer greater welfare and social insurance benefits. Employer ratings tend to be based on the degree of sponsorship; while loss of sponsorship loses the employer the ability to use the plan as a workforce management tool, the employer tends to gain more from the loss of risk (the financial risk of sponsorship and the fiduciary, legal and regulatory risks of sponsorship).

<u>Defined Benefit</u> The DB Framework focuses on a "typical" (although simplified) corporate sponsored defined benefit plan (1% of final average salary for each year of service). While it is an US example, similar plans are found in Canada and would have a similar rating.

Based on analysis with the Framework, DB plans, where they exist, do a good job protecting society and individuals. Society does well because benefits are generally robust, secure, and most plans cover all employees. Individuals are well protected from the risks of retirement, since these risks are borne by the plan. However, both individuals and society are reliant on employer paternalism (to both establish a sufficient level of benefits and maintain the plan) and society and individuals are at risk if the plan is frozen or terminates. For individuals, the presence of lump sum payments (a common feature, particularly in the US) negates the longevity protection in the plan.

Within a DB design, employers take on many of the risks that individuals are protected against. These risks, and the long-term commitment entailed by a DB plan, can distract the employer from the operation of the core business. Employers are in theory able to use market hedges to help mitigate these risks, particularly investment risk, but typically have not done so. Managers are often tempted to manage the plan in a way that reduces current costs but increases potential costs (generally by taking on investment risk or underreporting cost).

Market instruments can hedge the risks of DB plans, although in practice these instruments are rarely used. Market instruments are also not complete (few long duration bonds are available, and no systematic longevity hedge is available).

As a result the plan fits well for society and individuals (with yellow-green ratings in each category), but less so for employers (red-yellow) and markets (yellow). Moral hazard lowers ratings for society and individuals (from yellow- green to yellow for each stakeholder) and markets (from yellow to red-yellow). As noted above, the voluntary nature of the system, the reliance on employers to set adequate benefit levels (and maintain plans), the ability of the plan to go bankrupt, and the lack of use of market instruments to hedge risks all contribute to moral hazard in the system.

<u>Defined Contribution</u> There are many design variations that fall within a defined contribution (DC) rubric. For the Framework, we have considered the typical US DC plan design where the employer contributes to match employee contributions (plan matches 50% of the first 6% of employee contributions, yielding a total contribution of 9% per year – 6% from the employee, and 3% from the employer).

Individuals face more risk under the DC design (versus the DB design) because individuals bear investment and longevity risk, individuals do not understand how to prepare for retirement, and the plan is not designed to ensure good outcomes (good outcomes depend on smart choices by individuals). Society therefore is at risk because individuals (collectively) could see disparate outcomes (within or between generations), putting demands on future taxpayers. Moreover, the plans are not countercyclical; at a time of market decline, older workers could be losing their jobs, needing to take early retirement when their defined contribution accounts would have declined.

Within the Framework analysis, DC plans work well for employers, who do not bear the investment and longevity risk. However, the plans are not risk-free, since employers still sponsor the plan and therefore face fiduciary, legal and regulatory risks.

DC plans do not efficiently use markets or market instruments; individuals are not strong investors, the plans do not take advantage of the power of group investing, and fees tend to be high, and not well disclosed.

Because of the possibility of a wide disparity of outcomes among individuals (and the sensitivity to economic cycles), the plan carries a yellow rating for individuals and society. Employers also receive a yellow rating, because, as plan sponsors, employers face sponsorship risks. Markets are not used well and receive a red-yellow rating.

Moral hazard reduces the ratings for individuals and society to from yellow to red-yellow. Again, taxpayers (society) will be at risk if individuals have poor outcomes, and we're not convinced that the plans can weather significant economic downturns. Individuals also tend to misunderstand the risks they are taking. Employers do not see significant additional moral hazard so the average rating with moral hazard remains at yellow. Markets already have a red-yellow rating; the average rating after moral hazard remains at red-yellow.

<u>Non-traditional plans</u> The non-traditional plans tend to earn higher ratings than the traditional DB and DC plans. These plans were chosen for Framework analysis because we believed they made significant improvements on the traditional DB/DC structure. Plan provisions are summarized in the individual frameworks (Appendices III, IV and V). In this section we highlight the features of these non-traditional plans. In general, each plan will have many of these features, but each feature is not a part of each plan. We will discuss them collectively, without drawing distinctions as to which plan contains which feature, except to illustrate particular points.

The non-traditional plans improve reliability for society by providing robust for all employees regardless of employer. Individuals also have inflation protection, well-structured benefits that are not offered as lump sums and benefits that carry across the career (by carrying across individual employers). Individuals contribute to the plan, ensuring shared risk between employer and individuals. These plans have generous benefits, and because they are carried across individual employers, do not face the risk of termination or benefit elimination.

As a result, these plans earn high marks for individuals and society. The UMC and OTPP plans both earn green ratings for individuals, and the UMC plan earns a green rating and the OTPP a yellow-green rating for society (the ratings are closer than the averaged color suggests). The UMC and OTPP plans both have a strong employer backstop, and the OTPP also has a taxpayer backstop as well (the plan is funded equally by teachers and the Ontario Government). The Dutch plan achieves yellow-green ratings in the society and individual category as well; the risk sharing mechanisms in the plan, while making it more robust in the long-term, can create confusion among individuals. In addition, there are concerns that the self-adjusting mechanisms may not be strong enough to withstand industry or significant economic decline.

The non-traditional plans also do better for employers mostly because they do not subject the employers to the risk of sponsorship. While the employer loses the ability to manage the workforce with the plan, they also lose the risks, financial, legal and regulatory, of sponsorship. Each of these plans earns a yellow-green rating for employers. These plans also earn higher market ratings, averaging a yellow-green rating for each plan, because they have the advantages of group investing, tend to report and accrue costs on a market basis and in some cases (although not as much as some may have hoped) have used more sophisticated investment and hedging instruments.

These plans still face moral hazard risks, which shifts the rating down one level (with the exception of the employer rating for the Dutch plan and the market rating for the OTPP plan). While these plans are well run, and have a strong governance structure, there are no guarantees these plans will continue to be run in a similar fashion going forward. They also face many of the same temptations to push costs to future generations (particularly by taking additional investment risk today).

More detail on the Framework analysis for each of the five plans is found in Appendices I – V. Table V provides the summary ratings for each stakeholder, before and after moral hazard.

Observations from the Measurement Framework

Having evaluated five plans through the Framework, we have defined seven features that create strong plan design. Finally, we offer some observations about design features and well they translate from the use in a specific plan to possible use by a number of plans with different characteristics.

<u>Strong Governance.</u> Plans with robust, transparent, and well-understood governance structures work well. Each of the non-traditional designs has a degree of independence from the organizations that fund the plans; partly because of this degree of independence, they have a robust governance structure to ensure the plan functions properly. This degree of independence enables the plan to focus primarily on the well-being of the plan (and its participants) and not the well-being of the contributing entity (generally an employer). This removes the plan from the conflicts between the plan and core business that can arise, particularly with an employer-sponsored DB or DC plan

Key features for these non-traditional plans include:

- Independent boards made up, in whole or in part, of retirement and investment experts. The OTPP Board has eight members plus a chair, all of whom are retirement professionals (the Ontario Teacher's Federation may appoint one teacher to the Board).
- Board members may be chosen by employers or employees but they do not act as representatives of the employer or employee. Typically, they have professional experience in pensions and investments.
- Plans have pre-set rules about how to change contributions or benefit levels (some plans have pre- or post-retirement inflation indexation). The Dutch industry wide plans have a "policy ladder" which predetermines how contributions and benefit indexation are affected by funding levels in the plan.
- The Board sets the contribution rates and those funding the plan must pay their share of the cost; contribution rates are not negotiable.
- The Board sets benefit levels that are common for all members.
- Where members are union members, benefits are not subject to negotiation (benefit levels are set by the Board, on which the union has representation.)

Strong governance implies a strong role for society (government) in its role as regulator. Note that strong governance does not require strong government regulation; in some cases, the plans with strong governance exist because there is less government regulation upon the plan and the plan sponsor has taken the responsibility to ensure that its own governance structure is strong. One could argue that too many rules and regulations create a situation where the plan is so busy "following the rules" that it cannot focus on proper governance. Successful retirement systems need strong governance.

Alignment of Roles with Skill. Within the Framework tool, plans that allocate roles away from individuals and employers, in particular, score better. Key features for these non-traditional plans include:

- Use of professional investment advisors to make investment decisions (individuals do not make investment choices).
- Plan operation independent of the employers of the plan participants. In particular, the plans have an independent board, comprised mostly, if not solely, with retirement and investment professionals who act on behalf of the plan, rather than the plan sponsor (cutting contributions to meet budget needs) or plan participants (raising benefits, particularly in unionized situations).
- An independent board with full authority to levy contributions from participants and their employers. The board is focused fully on what is necessary to keep the plan solvent. This requires a commitment from the employers and participants to fund the plan, requiring communication and planning. The OTPP has surveyed Ontario teachers as to what maximum level of contributions they are willing to provide (the plan is half funded by teacher contributions).
- Offering limited choices to participants, focusing on traditional annuities (these plans do not offer lump sums except small amounts at termination.)

Behavioral finance would suggest that structured choices could also work. The non-traditional plans that we have profiled offer limited choice; they may have particular cultural or industry that allows for limited choice. Structured choice, including defaults, has been used within DC plans to improve enrollment rates and contribution rates (see work of Laibson et al). However, within DC plans many of the structured choices make presumptions about the level of contribution and risk that would be appropriate. These structured choices often assume levels of risk that might be inappropriate for many individuals (e.g. 40% equity allocations at age 65). Better choice cannot take the place of proper pooling and hedging mechanisms.

Presence of self-adjusting mechanisms. Self-adjusting mechanisms permit the plan to adjust benefits (including benefits paid to retirees) and contributions based on plan experience. These mechanisms can also be seen as risk sharing mechanisms. One criticism of the DB and DC plans is that by focusing solely on the insurance or investment model, they put all risk to one party (employer sponsors for DB, participant for DC) and none to the other (participant for DB, employer sponsor for DC). A more robust system would share risks. This however requires a new way of thinking about the promise of the benefit that would permit changes in benefit amounts. Examples of self-adjusting mechanisms in these non-traditional plans include:

- The Dutch industry wide plan formulae are generally career-pay based benefits. Benefits are indexed pre-retirement and post-retirement with inflation. However, both pre- and post-retirement indexation is conditional on plan performance. In this case, if the plan has negative experience, not only do contributions increase, but expected inflationary increases can be foregone.
- The OTPP has recently introduced conditional inflation indexing for its retirees. This will take twenty years to phase in fully, but eventually, post-retirement indexation for retirees will also be conditional on fund performance.

Self-adjusting mechanisms also exist within the Swedish social insurance system, including mechanisms to increase retirement age over time as cohort longevity increases.

Self-adjusting mechanisms must be pre-designed and rigorously implemented. Plan sponsors and administrators must be willing to share gain and loss with participants. We know of a plan with a self-adjusting mechanism that was willing to share investment gain with participants, but became reluctant to do so (and refused to do so) when there was a significant investment loss. A plan that is not willing to share both loss and gain cannot reap the full benefit of self-adjusting mechanisms.

Self-adjusting mechanisms are attractive because they allow the plan to continue to take risk (particularly investment risk); if equities outperform risk-free assets, the participants are able to earn higher benefits for lower contributions. Self-adjusting mechanisms are often designed using ALM models and Monte Carlo type scenarios of market performance given a typical asset mix. Models by definition are limited, and the 2008/2009 liquidity crisis is just one example of how market events can be more devastating than what can be predicted by typical capital market scenarios. Moreover, steep declines in markets can lead to less available cash for pension funding and higher unemployment, leading to more forced early retirement. These cascading scenarios are outside the ability of computer models to handle. Third parties report that De Nederlandsche Bank acknowledged that existing risk management instruments in the Dutch industry-wide plans are less effective than originally thought (Preesman, 18 March 2009). If self-adjusting mechanisms are not sufficiently robust to withstand market corrections, they may not represent strong retirement design feature.

We are also not sure if self-adjusting mechanisms within an industry collective plan could withstand the decline of that industry (e.g. steel manufacturing in the US). As an industry declines, and more workers are forced into retirement, there would be less money available for cash contributions, more retirees in the fund (than active workers) and possibly more workers entering retirement sooner than might have been predicted. These plans would at the very least have to shift their expectations over time to focus more on lower levels of securitized benefits and may be able to take fewer risks than when originally designed.

Finally, there are fundamental economic questions as to whether it is better to hedge these risks in the market rather than share them with plan participants. The erosion of purchasing power through inflation can erode the insurance protections of retirement benefits, suggesting that this risk ought not to be subject to adjustments for plan performance.

At the 2008 R20/20 conference, participants raised concerns that the willingness of employed participants to take on risk may be very different from the willingness of retirees to take on those same risks. They suggested it may be better if these funds are bifurcated so that retiree benefits (and the benefits of those approaching retirement) are securitized while benefits for working employees might be subject to more investment risk. This may lower the eventual benefits that can be provided, but would provide greater security and better risk management.

<u>Solidarity among members.</u> These non-traditional plans have strong solidarity among members, as evidenced by the following features:

- Both the OTPP and UMC plans are organized around a particular profession (teachers and clergy, respectively). The Dutch plans are typically organized by industry. All members of the profession within a large geographic area (Ontario, the US, and the Netherlands, for the

OTPP, UMC and Dutch plans, respectively) are automatically in the plan, and if they change employers (within that profession or geographic area) they remain members of the plan. The organization can also be by union groups.

- Plans may require significant employee contributions. The OTPP requires employees to contribute half of cost of the plan annually (the other half is contributed mostly by the Government of Ontario with minor contributions from other employers in the system). For 2009, employee contributions were 10.4% up to the Canadian Pension Plan (CPP) Maximum Pensionable Earnings limit ($CN 46,300) and 12.0% over the CPP limit; employer contributions are equal to employee contributions (OTPP 2008).
- Plans adjust contributions or benefits based on fund performance. Adjusting benefits and contributions for members ties members into the performance of the fund, and gives members a share in the stake of how well the plan is managed (as opposed to having a third party – the employer – solely responsible for plan management).

One concern about the effectiveness of solidarity is the extent to which demographic shifts (plan population aging) can affect the ability of the plan to maintain solidarity. As noted earlier, plans with an aging membership or in a declining industry may have difficulty maintaining solidarity among plan members. Solidarity may also be tested by extreme conditions; the Dutch industry wide plans saw strains in solidarity with recent market downturns, with unions insisting benefits cannot be significantly reduced (Preesman 16 February 2009) and retiree organizations calling for a rescue fund for retirees (Preesman 13 March 2009). These non-traditional plans also have high natural internal cohesiveness among participants (teachers within a union, clergy within a denomination, and Dutch citizens (within a particularly industry or union)); it is not known to what extent the internal cohesiveness must already exist to get the benefits from solidarity.

<u>A degree of independence from the employer.</u> These non-traditional plans have a sponsor who is not the individual employer who is funding the plan. The OTPP is jointly sponsored by the Ontario Ministry of Education and the Ontario Teacher’s Federation, making it separate from the independent school boards that employ the teachers covered by the plan. The Dutch industry wide schemes are independent of the employers whose employees participate in the plan. The UMC plan is sponsored by the United Methodist Church and not by the individual parishes.

In these non-traditional plans, the employers are, not strictly speaking, responsible for any plan underfunding (although they will likely be charged higher contribution rates should the plan become underfunded). While some may argue this is a weak distinction, we have seen that these non-traditional plans also have stronger governance models and self-adjusting mechanisms that adjust both contributions and benefits.

One degree of concern would be that the employers that participate in these plans also have a high degree of affinity for the plan. Employers that were not related might not cooperate as well with a plan with which the employer and employees did not have a tight affinity (an employer might simply pull out of a plan the first time contributions got too high for the employer to bear).

<u>Use of groups.</u> All teachers in Ontario participate in the OTPP, all ministers in the United Methodist Church participate in the UMC plan, and the Dutch industry wide plans are typically organized by industry or profession (and cover many or all workers in that industry or profession the Netherlands). Participants at the 2007 R20/20 conference, which focused on aligning roles with skills, concluded that having individuals participate in large groups was one way to reduce

the information asymmetry between individuals and markets (individuals who don't have expertise in the markets can hire someone who does have market expertise). In addition, it provides for lower administrative and investment fees (than individual account plans or smaller pension plans), improved coverage (all employers are in the system) and perfectly portable benefits (to the extent participants stay within the profession/geographic area). This is in addition to the benefits of pooling of mortality risk.

Nearly default-free discount rates. Several of these non-traditional plans use discount rates that are nearly default-free to measure actuarial funded status. For example, in its 2007 valuation the OTPP presents accrued benefits measured with a of 4.65% discount rate, which is the rate as of January 1, 2007 on long-term Government of Canada real-return bonds plus 50 basis points to reflect the credit risk for the Province of Ontario (OTPP 2008). The Dutch industry wide plans measure accrued benefits[2] on a fair value basis (using default-free rates) (Ponds and van Riel, 2007).

Conclusions

The Measurement Framework was developed to aid in the evaluation of new retirement plan designs, as part of the Society of Actuaries Retirement 20/20 project. The Framework has been used to evaluate five plans. By analyzing non-traditional designs, we have learned valuable insights into how to strengthen plan design for the future. We believe the Framework, while limited, can help elucidate the trade offs in design made to benefit the stakeholders in the retirement system, society, individuals, employers and markets. New plan designs should consider incorporating strong discipline in governance and pricing, aligning roles with skills to take advantage of professional expertise (and provide better outcomes for individuals), provide a stake for participants in the plan outcome (through adjustments to benefits and/or contributions) and consider carefully the role of the employer (as sponsor or merely contributor). The exact balance of plan features will depend on that plan and its goals and outcomes.

[2] Accrued benefits are measured both with future inflation indexation (pre-and post-retirement) and without future indexation. The different measures are used for different purposes in the policy ladder.

Table I: Measurement Framework Criteria Society's Needs & Risks	
Criteria	**Objective**
Adequate	Protects vulnerable citizens.
Affordable	Does not take resources from other social needs. Ensures risk pooling done efficiently.
Sustainable	Sustainable across and within generations. Equitable across and within generations.
Robust	Fair, covers a great majority, creates shared economic growth, and avoids moral hazards.
Does not promote economic risk	Efficiently allocates resources and encourages labor force participation.
Does not promote political risk	Promotes fiscal/political integrity and political stability.
Does not lead to system failure	Withstands shocks, not prone to instability or adverse incentives.
Addresses imperfections of other stakeholders	Promotes strong individual decision-making and covers lack of market instruments.
Promote social solidarity and integrity	Ensures basic standards of living; ensures risks are shared.
Adjusts to changing demo-graphic and economic conditions	As demographic and economic conditions shift, plan can respond to meet societal needs.

Table II: Measurement Framework Criteria Individual's Needs & Risks	
Criteria	**Objective**
Guaranteed income	Provides substantial level of income protection.
Predictability of income	Facilitates retirement planning.
Retirement flexibility	Allows choice of retirement age, including possibility to phase into retirement.
Portability	Minimizes loss upon employment termination.
Sensitive to employment conditions	Benefits may vary in line with employment conditions.
Sensitive to family needs	Benefits may vary in line with spousal and children needs.
Requirement for individual skills	Level of knowledge required to plan for retirement.
Investment risk	Protects against fluctuations in market returns.
Longevity risk	Protects against possibility to outlive assets.
Inflation risk	Includes both pre and post retirement inflation.
Premature retirement risk	Protects against forced early retirement due to disability, family circumstances, and involuntary termination.

Table III: Measurement Framework Criteria Employer Needs & Risks	
Criteria	**Objective**
Supports primary business purpose	Enhances core purpose of the employer's business.
Workforce management: attraction & retention	Enhances business value by allowing attraction and retention of the "right employees".
Workforce management: transition of employees	Enhances business value by facilitating the orderly transition of employees.
Supports new norms for work and retirement	As needed, supports shifting norms for work and retirement, e.g. phased retirement, return to work, etc.
Responsive to owners	Responds to needs of owners, e.g., shareholders for public companies, which may limit amount of risk to be taken.
Business risk	Ability to react quickly to changes in the competitive landscape.
Regulatory risk	Allows plan to be operated to fit needs and change to meet conditions easily within regulatory framework.
Fiduciary risk	Allows plan to be easily operated to minimize fiduciary liability.
Litigation risk	Allows management of plan to avoid lawsuits.

Table IV: Measurement Framework Criteria Markets Needs & Risks (includes both financial markets and intermediaries (e.g. insurers))	
Criteria	**Objective**
Maximizes use of markets	Effectively uses markets and hedging mechanisms; stakeholders can purchase hedging instruments cost effectively.
Transparent (cost)	Costs of plan are transparent (fees, costs to sponsors, other stakeholders, etc).
Strong Governance	Fiduciary roles of plan sponsors well defined. Plan structure minimizes agency issues, particularly regarding plan investment and risk taking.
Efficiently priced	Market price is well understood and accepted by stakeholders. Plan does not contain features that cannot be efficiently priced. Plans incorporate discipline in pricing.
Efficient risk bearing	Plan efficiently pools idiosyncratic risks and hedges systematic risks (both economic and demographic).
Allocation of risk	Plan efficiently allocates risk across stakeholders, giving each stakeholder the risk he can best bear.

Table V Measurement Framework Composite Rating					
Before Moral Hazard					
Stakeholder	**DB (Appendix I)**	**DC (Appendix II)**	**Dutch (Appendix III)**	**OTPP (Appendix IV)**	**UMC (Appendix V)**
Society	Yellow-Green	Yellow	Yellow-Green	Yellow-Green	Green
Individual	Yellow-Green	Yellow	Yellow-Green	Green	Green
Employer	Red-Yellow	Yellow	Yellow-Green	Yellow-Green	Yellow-Green
Market	Yellow	Red-Yellow	Yellow-Green	Yellow-Green	Yellow-Green
After Moral Hazard					
Stakeholder	**DB**	**DC**	**Dutch**	**OTPP**	**UMC**
Society	Yellow	Red-Yellow	Yellow	Yellow	Yellow-Green
Individual	Yellow	Red-Yellow	Yellow	Yellow-Green	Yellow-Green
Employer	Red-Yellow	Yellow	Yellow-Green	Yellow	Yellow
Market	Red-Yellow	Red-Yellow	Yellow	Yellow-Green	Yellow

Appendix I
Traditional Final Pay DB Plan
About the Framework

About the plan being evaluated:

- This is a single-employer, corporate sponsored defined benefit plan, with a final pay (or final average pay) formula. For example, 1% of highest 5 years of salary for each year of service, but no greater than 35% of final average salary.
- We have not assumed any subsidized early retirement or joint and survivor benefits but have considered the right of the employer to include them.
- These ratings would only apply to a corporate single employer plan. The nature of the plan sponsor (corporate vs public, single employer vs multi-employer) might change the evaluations and particularly the effect of moral hazard.
- We are not considering the voluntary nature of the system which means, primarily, that not all individuals have access to coverage. We have considered the ability of the employer to set and adjust benefit levels in setting ratings.
- We are not considering the effect of the PBGC, PBGF or any specific government guaranty fund. We do consider what the presence of a government guaranty fund (generic) may do to increase moral hazard.

About the ratings

- The overall ratings were done assuming a “perfect world” where actors understood and took advantage of the best features of plans. They do not consider moral hazard to stakeholders & agents.
- A second set of ratings were developed considering the effects of moral hazard. Moral hazard are defined in this application as when stakeholders (particularly individuals) can be led to not act in their own best interests based on a lack of understanding of features & consequences or, when agents take actions that don’t align with interests of stakeholders, particularly individuals or shareholders/owners. While regulatory risk is its own category, we’ve considered regulatory risk as another adverse incentive (elected officials, including the judiciary, may be guilty of overzealous regulation, affecting the action of individuals, employers and the markets).

Appendix I
Traditional Final Pay DB Plan
About the Framework

About the categories

- Each of the stakeholder categories has a different number of subcategories, from 6 to 11 subcategories.
- The example below shows you how to read the summary of the society category, with both the composite and sub-category ratings.

The average rating of yellow-green is a composite of the ten society subcategories.

The ratings for the ten -subcategories are shown in the color line. They are color grouped so you can see how many of each rating were received.

Ratings for each subcategory were adjusted for the effects of moral hazard. This shows the new composite rating after moral hazard are considered as well as the new color line.

Society (composite rating)	Meets society's needs and risks.	**Yellow- Green** Individual criteria ratings: Plans protect long-service workers well (less so short-service workers) avoiding the need for more government sponsored benefits.	**Yellow** Individual criteria ratings after moral hazard: : System depends on employer paternalism, and employer moral hazard require government regulation, which destabilizes system.

Measurement Framework

Appendix I
Traditional Final Pay DB Plan - Summary

Summary			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Society (composite rating)	Meets society's needs and risks.	**Yellow- Green** Individual criteria ratings: Plans protect long-service workers well (less so short-service workers) avoiding the need for more government sponsored benefits.	**Yellow** Individual criteria ratings after moral hazard: System depends on employer paternalism, and employer moral hazard require government regulation, which destabilizes system.
Individuals (composite rating)	Meets individuals' needs and risks.	**Yellow- Green** Individual criteria ratings: By transferring risks of retirement to the employer & its shareholders, the plan does a good job of handling the risks of individuals	**Yellow** Individual criteria ratings after moral hazard: Individuals could be at risk should the employer enter bankruptcy if plan not fully funded. Presence of lump sums reduces longevity benefits.
Employers (composite rating)	Meets employers' needs and risks.	**Red-Yellow** Individual criteria ratings: The long-term nature of the commitment does not work well for corporate sponsors. Many younger employees do not value benefits.	**Red-Yellow** Individual criteria ratings after moral hazard: Available hedging mechanisms not well used; managers at significant risk to manage plan in a way that increases risks in the future.

Retirement 20/20 Measurement Framework

Appendix I
Traditional Final Pay DB Plan - Summary

Summary			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Markets (composite rating)	Meets markets' needs and risks.	**Yellow** Individual criteria ratings: In theory, plans can be hedged to remove risk, although in practice this is rarely done. Transfers risk to shareholders.	**Red-Yellow** Individual criteria ratings after moral hazard: Hedges are available, but not widely used.

Retirement 20/20 Measurement Framework

Appendix I
Traditional Final Pay DB Plan - Society

Society's Needs & Risks (Composite Rating: Yellow-Green)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Adequate	Protects vulnerable citizens.	**Yellow- Green** Protects those who are able to hold down employment for long periods of time; less protection for workers who change jobs frequently.	**Yellow** Adequacy depends on employer paternalism including the willingness to maintain benefit levels. Would employers provide benefits to all low-paid employees without statutes requiring such coverage?
Affordable	Does not take resources from other social needs. Ensures risk pooling done efficiently.	**Yellow- Green** Private employer sponsorship does not put cost burden on state; however costs are generally tax deductible and tax sheltered pre-retirement. May not pool risks efficiently in markets	**Yellow** Managers may not use market hedging, preferring to gamble on market returns.
Sustainable	Sustainable across and within generations. Equitable across and within generations.	**Green** Can be funded to directly allocate costs back to the current generation of owners/shareholders.	**Yellow- Green** Can be tempting to push costs to future generations of owners/ shareholders.
Robust	Fair, covers a great majority, creates shared economic growth, avoids moral hazards.	**Yellow- Green** DB plans can provide benefits across income strata, use markets efficiently through group investing and expertise of well trained advisors. However, degree of robustness depends on employer paternalism.	**Yellow** Wide range of employer latitude to set benefit level and decide to follow best funding and investing policies.

Appendix I
Traditional Final Pay DB Plan - Society

Society's Needs & Risks (Composite Rating: Yellow-Green)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Does not promote economic risk	Efficiently allocates resources and encourages labor force participation.	**Yellow- Green** Final pay plans may encourage employee retention, particularly among older employees, to reach a certain benefit level, but may be harder to encourage employees to work beyond a certain point.	**Yellow- Green** Moral hazard not significant.
Does not promote political risk	Promotes fiscal/political integrity and political stability.	**Yellow- Green** Politicians tend to try to "fix" the system (e.g., cash balance plans).	**Red-Yellow** Politicians may see reducing the tax shelter as potential revenue decreasing system stability. Significant risk of participant litigation if they do not like benefit changes.
Does not lead to system failure	Withstands shocks, not prone to instability or adverse incentives.	**Yellow** Employers can adjust benefit levels to decrease cost; slowly decreasing benefit levels can create pressure for other parts of the system to compensate.	**Red-Yellow** Absent regulation, managers have little incentive to promote long-term health of plan if it incurs high short-term costs.
Addresses imperfections of other stakeholders	Promotes strong individual decision making and covers lack of market instruments.	**Yellow** Individuals with long service get strong benefits but individuals with short service do not, and lump sums create temptations to use benefits for other purposes. Plans have access to market instruments.	**Red-Yellow** Current array of plan choices does not always encourage individuals to make decisions that best suit retirement needs (e.g., annuity over lump sum). Managers not incentivized to use market instruments to hedge risks.

Appendix I
Traditional Final Pay DB Plan - Society

Society's Needs & Risks (Composite Rating: Yellow-Green)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Promote social solidarity and integrity	Ensures basic standards of living; ensures risks are shared.	**Red-Yellow** Where plans are present, do encourage basic living standards and ensure risks are shared. However, Corporate sponsorship by nature does not encourage social solidarity or integrity. Can only encourage through tax subsidies.	**Red-Yellow** Moral hazard not significant.
Adjusts to changing demo-graphic and economic conditions	As demographic and economic conditions shift, plan can respond to meet societal needs.	**Yellow** Doesn't account for increasing longevity (e.g. fixed retirement age, early retirement provisions). Allows workers to continue to retire during downturn.	**Red-Yellow** As plans shift from more active to retired individuals, will be harder to adjust for changing conditions.

Appendix I
Traditional Final Pay DB Plan - Individuals

Individual's Needs & Risks (Composite Rating: Yellow-Green)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Guaranteed income	Provides substantial level of income protection.	**Yellow- Green** Benefit promise is well defined and based on final pay (income security). For short service employees, benefits are often quite small and not related to final pay at retirement.	**Red-Yellow** If plan terminates not fully funded (rare event), individuals close to or even in retirement can lose some benefits; presence of a government guaranty program could encourage employers to cease funding in financial distress situations.
Predictability of income	Facilitates retirement planning.	**Yellow- Green** Fixed promise allows for retirement planning. However, works best if you are with the same employer for a substantial portion of a career.	**Red-Yellow** If plan terminates not fully funded, (rare event) participants can lose some benefits; existence of a government guaranty program can offset some risk but may encourage employers in financial distress to underfund plan. Participants could be subject to changes in plan due to corporate events (e.g. merger or acquisition).
Retirement flexibility	Allows choice of retirement age, including possibility to phase into retirement.	**Yellow -Green** Ability to choose retirement age, but individuals may not understand how promise changes with retirement age; may not be able to phase into retirement with partial benefits.	**Yellow** Early retirement reductions, while actuarially sound, are not easy to understand and can be perceived as unfair by employees, causing them to devalue the plan.

Appendix I
Traditional Final Pay DB Plan - Individuals

Individual's Needs & Risks (Composite Rating: Yellow-Green)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Portability	Minimizes loss upon employment termination.	**Red-Yellow** Final pay formula creates very small benefits for those who leave pre-retirement.	**Red-Yellow** Lump sums can further expose leakage issues encouraging people to spend what seem to be small lump sums on non-retirement needs.
Sensitive to employment conditions	Benefits may vary in line with employment conditions.	**Yellow- Green** Can structure the plan to provide generous early retirement benefits for physically demanding jobs while postponed retirement and phased retirement features can exist in less taxing jobs.	**Yellow** Employees without a physical need for early retirement benefits can demand them in a "me too" philosophy, driving up the cost of plans.
Sensitive to family needs	Benefits may vary in line with spousal and children needs.	**Yellow- Green** Can structure the plan to provide benefits to spouse and children upon death (pre-and post-retirement).	**Yellow- Green** Moral hazard not significant.
Requirement for individual skills	Level of knowledge required to plan for retirement.	**Green** Only requires understanding of various benefits offered (not required to convert single sum to annuity stream, or know the level of single sum required).	**Yellow- Green** The presence of lump sum benefits can negate the annuities by encouraging people to take single sums and forego the lifetime guarantee.

Appendix I
Traditional Final Pay DB Plan - Individuals

Individual's Needs & Risks (Composite Rating: Yellow-Green)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Investment risk	Protects against fluctuations in market returns.	**Green** Risk borne by employer in most cases.	**Yellow** If employer makes risky investments, and plan terminates not fully funded, individuals can lose some benefits without realizing the risk they faced. Individual only at risk if employer terminates plan.
Longevity risk	Protects against possibility to outlive assets.	**Green** Efficiently hedged or pooled depending on arrangement.	**Yellow- Green** Presence of lump sum benefits can encourage individuals to forego the annuity's longevity protection.
Inflation risk	Includes both pre and post retirement inflation.	**Yellow** Final pay plan offers pre-retirement inflation protection, but corporate DB plans typically do not provide post-retirement inflation protection.	**Yellow** Moral hazard not significant.
Premature retirement risk	Protects against forced early retirement due to disability, family circumstances, and involuntary termination.	**Yellow- Green** Plan can be designed to provide early retirement subsidies and generous disability benefits.	**Yellow** Presence of these benefits depends on employer's degree of paternalism. Employees may not understand where they do or do not have coverage. Early retirement subsidies often misunderstood and seen as a "take-away."

Appendix I
Traditional Final Pay DB Plan - Employer

Employer Needs & Risks (Composite Rating: Red-Yellow)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Supports primary business purpose	Enhances core purpose of the employer's business.	**Red-Yellow** Can aid in the orderly retirement of employees, aiding core business purpose. However, mature plans have significant risk which can detract from core business purpose	**Red** Action of accounting standards can add volatility to employer cost.
Workforce management: attraction & retention	Enhances business value by allowing attraction and retention of the "right employees".	**Yellow** Better at attracting older employees and retaining long service employees. Younger employees are indifferent to plan design, and younger, short service employees are disadvantaged.	**Yellow** Moral hazard not significant.
Workforce management: transition of employees	Enhances business value by facilitating the orderly transition of employees.	**Yellow- Green** Can provide incentives for employees to stay or retire on a voluntary basis.	**Yellow** As population ages and baby boom retires, do we need people to retire early or work longer? Incentives may be not be set properly for generational shift.
Supports new norms for work and retirement	As needed, supports shifting norms for work and retirement, e.g. phased retirement, return to work, etc.	**Red-Yellow** Employees who work with a single employer their whole career derive the most benefit. Difficult to work with phased retirement, return to work. Plan can be designed with needs of different workers in mind.	**Red** Attempts to adjust the plan to move retirement ages later are seen negatively by employees as a benefit take-away.

Appendix I
Traditional Final Pay DB Plan - Employer

Employer Needs & Risks (Composite Rating: Red-Yellow)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Responsive to owners	Responds to needs of owners, e.g., shareholders for public companies, which may limit amount of risk to be taken.	**Red-Yellow** Financial commitment may extend beyond lifespan of employer. Can decrease or eliminate future benefit accruals. Can be impediment to other business decisions.	**Red** Managers have concerns around cost volatility, particular accounting cost, which may lead to practices that are not in the best interests of owners. Can mitigate volatility but it has not been common practice.
Business risk	Ability to react quickly to changes in the competitive landscape.	**Red-Yellow** Sponsor can only reduce future accruals and phase out of benefits can take a long time.	**Red** Managers are most concerned about volatility of cost which can be hedged but given that most other managers aren't hedging the cost, the cost of the hedge is seen as unaffordable.
Regulatory risk	Allows plan to be operated to fit needs and change to meet conditions easily within regulatory framework.	**Yellow** Long-term nature of promise attracts significant regulatory oversight. Lack of clarity on rules and multiple oversight agencies can lead employers to make changes later deemed not legal (e.g. cash balance in US).	**Yellow** Moral hazard not significant (DB plans are already highly regulated; not many additional avenues left for new regulation).
Fiduciary risk	Allows plan to be easily operated to minimize fiduciary liability.	**Red** Fiduciary responsibility is complicated and often not well understood. Concerns about liability may lead all employers to act in similar manner, which may be detrimental to both employees and shareholders.	**Red** Moral hazard not significant.

Appendix I
Traditional Final Pay DB Plan - Employer

Employer Needs & Risks (Composite Rating: Red-Yellow)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Litigation risk	Allows management of plan to avoid lawsuits.	**Yellow** Lawsuits can lead to reputation risk. Long-term nature of promise and length of liability period significantly increase litigation risk.	**Red-Yellow** Significant potential for employees to misunderstand the permanence of the benefit formula.

Appendix I
Traditional Final Pay DB Plan - Markets

Markets Needs & Risks (Composite Rating: Yellow) (includes both financial markets and intermediaries (e.g. insurers))			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Maximizes use of markets	Effectively uses markets and hedging mechanisms; stakeholders can purchase hedging instruments cost effectively.	**Yellow- Green** Economic hedges are available although cost may be prohibitive for smaller plans; demographic hedges not widely available.	**Yellow** While hedges are widely available, they are not widely used or understood and not always feasible for smaller plans.
Transparent (cost)	Costs of plan are transparent (fees, costs to sponsors, other stakeholders, etc).	**Green** Costs can be transparent	**Yellow** Regulations and statutes, including accounting requirements, have until recently not required or encouraged transparent costs.
Strong Governance	Fiduciary roles of plan sponsors well defined. Plan structure minimizes agency issues, particularly regarding plan investment and risk taking.	**Yellow** Governance regarding benefits is generally strong. Governance regarding plan investment and security to shareholders is weaker.	**Red-Yellow** Lack of clarity around governance standards leads to “follow the leader” where the industry norm becomes best practice.

Appendix I
Traditional Final Pay DB Plan - Markets

Markets Needs & Risks (Composite Rating: Yellow) (includes both financial markets and intermediaries (e.g. insurers))			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Efficiently priced	Market price is well understood and accepted by stakeholders. Plan does not contain features which cannot be efficiently priced. Plans incorporate discipline in pricing.	**Yellow** Traditional benefit features (e.g. early retirement subsidies) aren't efficiently priced. However plans can be designed without inefficient market features.	**Red-Yellow** Plan costs are subject to manipulation by managers.
Efficient risk bearing	Plan efficiently pools idiosyncratic risks and hedges systematic risks (both economic and demographic).	**Yellow- Green** Plan efficiently pools longevity and many other retirement risks. Plan can effectively hedge investment risks although instruments aren't there for systematic longevity risks.	**Red-Yellow** Managers tend not to choose risk hedging instruments. Managers may be tempted to choose risky investments that lower cost today but pass risk to next generation.
Allocation of risk	Plan efficiently allocates risk across stakeholders, giving each stakeholder the risk he can best bear.	**Red** Plan puts risk to shareholders – doesn't allocate any to individuals or other parties. Plans could be designed to share risks with employees. Investment risks could be hedged although they typically aren't. Demographic risks could be hedged in theory but market instruments aren't available because managers haven't shown interest.	**Red** Moral hazard not significant.

Appendix II
Traditional DC Plan
About the Framework

About the plan being evaluated:

- This is modeled on a 401(k) style defined contribution plan. We are assuming that the employee may contribute up to legal maximums, with the employer contribution being paid as a match of 50% up to the first 6% of employee contributions (maximum employer contribution of 3%). No other employer contributions are made. The individual makes all investment decisions and typically has options for stocks (including employer stock), bonds and money market funds, including target date or lifecycle funds. The plan has auto-enrollment (3% of pay, no future contribution increase) and enrolls participants in a target date fund. The individual has discretion at retirement as to how funds are disbursed; the individual can annuitize only through individual annuity purchase (annuity not available through the plan). There are no requirements for spousal consent on account distribution. Note that we are not considering the particular advantages or disadvantages of stock option plans, ESOPs or other more specific defined contribution designs.
- We are not considering the voluntary nature of the system which means, primarily, that not all individuals have access to coverage. We have considered the ability of the employer to set and adjust contribution levels (including setting the employer contribution as a match) in setting ratings.

About the ratings

- The overall ratings were done assuming a "perfect world" where actors understood and took advantage of the best features of plans. They do not consider moral hazard on behalf of stakeholders & agents.
- A second set of ratings were developed considering the effects of moral hazard. Moral hazard in defined in this application as when stakeholders (particularly individuals) can be led to not act in their own best interests based on a lack of understanding of features & consequences or, when agents take actions that don't align with interests of stakeholders, particularly individuals or shareholders/owners. While regulatory risk is its own category, we've considered regulatory risk as another moral hazard (elected officials, including the judiciary, may be guilty of overzealous regulation, affecting the action of individuals, employers and the markets).

Appendix II
Traditional DC Plan
About the Framework

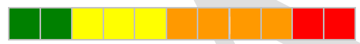
About the categories

- Each of the stakeholder categories has a different number of subcategories, from 6 to 11 subcategories.
- The example below shows you how to read the summary of the individual category, with both the composite and sub-category ratings.

The average rating of yellow is a composite of the eleven individual subcategories.

The ratings for the eleven subcategories are shown in the color line. They are color grouped so you can see how many of each rating were received.

Ratings for each subcategory were adjusted for the effects of moral hazard. This shows the new composite rating after moral hazard as well as the new color line.

Individuals (composite rating)	Meets individuals' needs and risks.	**Yellow** Individual criteria ratings:  Puts risks to individuals, although plans could offer mechanisms for individuals to hedge their risks better.	**Red-Yellow** Individual criteria ratings after moral hazard:  Individuals not sophisticated enough to use sophisticated hedging instruments, even if made available. Individuals also susceptible to products that claim to provide risk protection but do not.

Appendix II
Traditional DC Plan - Summary

Summary			
Criteria	**Description**	**Evaluation**	**Effect of moral hazard**
Society (composite rating)	Meets society's needs and risks.	**Yellow** Individual criteria ratings : Allocates costs directly, doesn't push costs of pensions to future generations. However, economically cyclical and creates winners and losers (generally aligned with economic status).	**Red-Yellow** Individual criteria ratings after moral hazard: Put society at risk if individuals plan poorly or are caught by economic downturns; can it survive a large-scale economic downturn?
Individuals (composite rating)	Meets individuals' needs and risks.	**Yellow** Individual criteria ratings: Puts risks to individuals, although plans could offer mechanisms for individuals to hedge their risks better.	**Red-Yellow** Individual criteria ratings after moral hazard: Individuals not sophisticated enough to use sophisticated hedging instruments, even if made available. Individuals also susceptible to products that claim to provide risk protection but do not.

Appendix II
Traditional DC Plan - Summary

Summary			
Criteria	**Description**	**Evaluation**	**Effect of moral hazard**
Employers (composite rating)	Meets employers' needs and risks.	**Yellow** Individual criteria ratings: Shareholders don't hold investment or longevity risk, but do hold fiduciary and legal risk. Plan adapts well to new norms for work and retirement	**Yellow** Individual criteria ratings after moral hazard: Simplicity of the plan means that regulatory hazards are less than with other types of design.
Markets (composite rating)	Meets markets' needs and risks.	**Red-Yellow** Individual criteria ratings: Costs are transparent to shareholders but lack of fee disclosure to individuals. Transfers risk to individuals.	**Red-Yellow** Individual criteria ratings after moral hazard: No incentive for sponsors or investment firms to make fees transparent to individuals.

Appendix II
Traditional DC Plan - Society

Society's Needs & Risks (Composite rating: Yellow)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Adequate	Protects vulnerable citizens.	**Red-Yellow** Low-paid individuals may have difficulty earning the match. Match signals participants that the contribution to earn the maximum match plus the match contribution create adequate retirement savings. Participants vulnerable to poor investment choices, swings in markets. No risk pooling. Individual accounts have higher administrative fees than pooled accounts.	**Red** Regulators may be susceptible to lobbying by investment firms to make investment choices available that aren't always in individuals' best interest. Program adequacy dependent on employer paternalism.
Affordable	Does not take resources from other social needs. Ensures risk pooling done efficiently.	**Red-Yellow** Individuals' lack of skill in retirement planning and investing will lead many individuals to do poorly, drawing on social resources. No risk pooling.	**Red-Yellow** Moral hazard not significant.
Sustainable	Sustainable across and within generations. Equitable across and within generations.	**Yellow** Creates high risk of failure, particularly for low paid and cohorts retiring during economic downturns. Low levels of contribution may create false sense of sustainability.	**Red-Yellow** Intergenerational risk transfer occurs if future generations must provide additional social benefits for inadequate savings by previous generation.

Appendix II
Traditional DC Plan - Society

Society's Needs & Risks (Composite rating: Yellow)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Robust	Fair, covers great majority, creates shared economic growth, avoids moral hazards	**Yellow** A design that focuses on matching favors wealthier individuals who are more easily able to save. Very hard to create shared growth for low paid.	**Red-Yellow** Plans require participants join and set robust contribution levels, often higher than what is signaled by employer. Target investment funds may offer more risk than some participants can take.
Does not promote economic risk	Efficiently allocates resources and encourages labor force participation.	**Red-Yellow** While it does not encourage early retirement and promotes longer work-force participation, it is structurally anti-cyclical (during economic booms, when workers are needed, more will retire, while during economic slowdowns, few will be able to retire). Plan design encourages employees to terminate to access funds.	**Red-Yellow** Moral hazard not significant.
Does not promote political risk	Promotes fiscal/political integrity and political stability.	**Yellow-Green** Relatively little political risk, except possibly for influence of investment managers in favor of high risk/high fee products	**Red-Yellow** Politicians may see reducing the tax shelter as potential revenue decreasing ability of individuals to save. Generations of individuals retiring with small account balances during economic downturn could create political pressure for more social benefits.

Appendix II
Traditional DC Plan - Society

Society's Needs & Risks (Composite rating: Yellow)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Does not lead to system failure	Withstands shocks, not prone to instability or moral hazard.	**Yellow** Employers can adjust match levels easily. However, plans only succeed if contributions are consistently made; downward adjustment/elimination of employer money could create social pressure for additional benefits in the future. Also, individuals less able to save in times of economic slowdown.	**Red-Yellow** Shocks hit poorer individuals most acutely (lower level of savings, less ability to save in good times). Prolonged economic downturn could put pressure on system for other solutions if generations cannot retire as needed.
Addresses imperfections of other stakeholders	Promotes strong individual decision making and covers lack of market instruments.	**Red-Yellow** Shelters owners/shareholders from investment risk. While auto-enrollment and target date funds helps individuals get enrolled and invested, withdrawals and loans send mixed signals as to the purpose of the money (it's not solely for retirement savings). Match design can send improper signals of the proper level of saving. Individuals generally do not understand investments and their inherent risk and are exposed to market cycles.	**Red** Auto enrollment and target date funds assume one plan fits all. Does not account for ability of individuals to take or not take risk. Target date funds do not hedge risks, particularly longevity risk.
Promote social solidarity/ integrity	Ensures basic standards of living; ensures risks are shared.	**Red-Yellow** Match design sends signals as to a sufficient level of savings and investment which generally do not provide sufficient retirement income.	**Red** As DC plans arose as an "add-on" contribution, levels started low and haven't increased.

Appendix II
Traditional DC Plan - Society

Society's Needs & Risks (Composite rating: Yellow)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Adjusts to changing demographic and economic conditions	As demographic and economic conditions shift, plan can respond to meet societal needs.	**Red-Yellow** While plan automatically adjusts to changing life spans, individuals may not understand they need to work longer to save more/shorten their retirement period. Anti-cyclical economically – individuals will likely continue work in a down economy when it may be better to pare down the number of workers.	**Red** Individuals may not understand the need to adjust retirement plans for changing lifespans (leading to inadequate retirement income) or realize may be less likely to be able to retire in down market.

Appendix II
Traditional DC Plan -Individuals

Individual's Needs & Risks (Composite rating: Yellow)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Guaranteed income	Provides substantial level of income protection.	**Red-Yellow** Typical contribution (6% employee with 3% employer match) does not provide adequate income for most individuals. Cumbersome and expensive for individuals to convert account balances to guaranteed income; conversion can also have negative tax consequences	**Red** Individuals may be sold products that provide unneeded features, or that do not provide true longevity guarantee. Cost of conversion at an individual rather than group rate harmful for less wealthy individuals with small account balances.
Predictability of income	Facilitates retirement planning.	**Red-Yellow** Works better for wealthier rather than less wealthy individuals (who can afford professional advice). Difficult to manage and understand value of account balance, particularly small balances.	**Red-Yellow** Moral hazard not significant.
Retirement flexibility	Allows choice of retirement age, including possibility to phase into retirement.	**Green** Unrestricted ability to choose retirement age.	**Yellow-Green** No protection for individuals who find they might have to retire early due to disability or other impairment.
Portability	Minimizes loss upon employment termination.	**Green** Perfect portability	**Yellow** Leakage is common, as participants take small account balances in cash on termination.

Appendix II
Traditional DC Plan -Individuals

Individual's Needs & Risks (Composite rating: Yellow)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Sensitive to employment conditions	Benefits may vary in line with employment conditions.	**Yellow** Can adjust contribution levels, but otherwise cannot tailor for more or less physically demanding jobs (which may require different retirement dates). Difficult to incent early retirement.	**Red-Yellow** As noted earlier cannot ease out individuals during time of economic downturn.
Sensitive to family needs	Benefits may vary in line with spousal and children needs.	**Yellow** Full account balance passes to beneficiaries. However, difficult for individuals to estimate joint life survival probabilities and structure income accordingly.	**Yellow** Moral hazard not significant.
Requirement for individual skills	Level of knowledge required to plan for retirement.	**Red-Yellow** Plans typically require individuals to make investment choice which requires great degree of individual sophistication in investment and retirement planning; auto-pilot features help but individuals don't understand risk embedded in those features.	**Red** Individuals could be susceptible to poor advice and poor decisions made could lead to society having to make up difference.
Investment risk	Protects against fluctuations in market returns.	**Yellow** Individuals subject to downside risk but also upside potential. Hedging vehicle could be made available.	**Red** Individual always bears full brunt of investment risk. Hedging products aren't always available, and when they are individuals don't know how to use them. Professional advisors may encourage investments which maximize advisor income, which are often complicated and risky.

Appendix II
Traditional DC Plan -Individuals

Individual's Needs & Risks (Composite rating: Yellow)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Longevity risk	Protects against possibility to outlive assets.	**Red** No inherent longevity protection; can purchase annuities but can be expensive as done at individual rates (insurers assume anti-selection).	**Red** Individuals may not understand need for longevity protection, and may be confused by strategies that only appear to offer protection.
Inflation risk	Includes both pre and post retirement inflation.	**Red-Yellow** Ability of benefits to grow with market returns provides weak inflation protection (not strongly correlated). Can purchase inflation linked bonds (TIPS) but not commonly offered.	**Red** No incentives for plan sponsors to provide inflation linked strategies; investment firms will tend to favor equity over inflation protection.
Premature retirement risk	Protects against forced early retirement due to disability, family circumstances, and involuntary termination.	**Red** Retirement earlier than planned can be disasterous unless individual has over-saved. Market timing (retiring in a down market) can also deplete savings.	**Red** Over-saving is an inefficient way to prepare for retiring early than expected and a strategy not realistically used by poorer individuals. Could affect ability to educate children.

Appendix II
Traditional DC Plan - Employers

Employer Needs & Risks (Composite Rating: Yellow)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Supports primary business purpose	Enhances core purpose of the employer's business.	**Yellow-Green** Allows employer to focus on core business, although still requires employer sponsorship with some HR and administrative costs.	**Yellow-Green** Moral hazard not significant
Workforce management: attraction & retention	Enhances business value by allowing attraction and retention of the "right employees".	**Yellow** Existence of a plan more important than actual design. Better at attracting younger rather than older employees. Does not generally enhance retention.	**Yellow** Moral hazard not significant
Workforce management: transition of employees	Enhances business value by facilitating the orderly transition of employees.	**Red-Yellow** Little incentives for employees to stay or retire on a voluntary basis. Cannot encourage or discourage behavior.	**Red-Yellow** Moral hazard not significant
Supports new norms for work and retirement	As needed, supports shifting norms for work and retirement, e.g. phased retirement, return to work, etc.	**Yellow-Green** Easily supports new norms for work and retirement. Does not easily support different retirement ages for classes of workers with different retirement needs	**Yellow-Green** Moral hazard not significant

Appendix II
Traditional DC Plan - Employers

Employer Needs & Risks (Composite Rating: Yellow)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Responsive to owners	Responds to needs of owners, e.g., shareholders for public companies, which may limit amount of risk to be taken.	**Green** Known financial commitment. No long-term commitment.	**Green** Moral hazard not significant.
Business risk	Ability to react quickly to changes in the competitive landscape.	**Green** Can change contribution level instantaneously, with no long phase-out period.	**Green** Very little risk that regulations could change business' ability to change future benefits quickly.
Regulatory risk	Allows plan to be operated to fit needs and change to meet conditions easily within regulatory framework.	**Yellow-Green** Flexible in terms of changes to future design. Because contributions are tax deferred, it does attract regulatory oversight.	**Yellow** Regulatory framework may be too loose – employers often offer many investment options and more employee choice believing this will mitigate litigation risk. Could see regulators pushing more risk back to employers (e.g. poor investment outcomes).
Fiduciary risk	Allows plan to be easily operated to minimize fiduciary liability.	**Red** Fiduciary responsibility is complicated and often not well understood. Concerns about liability may lead all employers to act in similar manner, which may be detrimental to both employees and shareholders.	**Red** Moral hazard not significant.

Appendix II
Traditional DC Plan - Employers

Employer Needs & Risks (Composite Rating: Yellow)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Litigation risk	Allows management of plan to avoid lawsuits.	**Red-Yellow** Lawsuits can lead to reputation risk. Individuals who make poor outcomes may look to employer for restitution; cannot cure this systematically through the plan.	**Red-Yellow** Moral hazard not significant.

Appendix II
Traditional DC Plan - Markets

Markets Needs & Risks (Composite Rating: Red-Yellow) (includes both financial markets and intermediaries (e.g. insurers))			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Maximizes use of markets	Effectively uses markets and hedging mechanisms; stakeholders can purchase hedging instruments cost effectively.	**Yellow** Could be designed to make better use of market mechanisms. Lifecycle accounts are a weak attempt; they don't hedge.	**Red-Yellow** Little incentive for plan sponsors to maximize use of markets, and little incentive for fund providers to design better market hedges.
Transparent (cost)	Costs of plan are transparent (fees, costs to sponsors, other stakeholders, etc).	**Red-Yellow** Plans do not disclose fees, so individuals do not know which investments are more costly.	**Red** Lack of disclosure of fees means plan participants pay high fees relative to other consumers; no incentive for employer or investment industry to change.
Strong Governance	Fiduciary roles of plan sponsors well defined. Plan structure minimizes agency issues, particularly regarding plan investment and risk taking.	**Yellow** Unclear what fiduciary standards around investments ought to be. Plans may work better when employers make decisions on behalf of employees.	**Red-Yellow** Lack of clarity around governance standards leads to "follow the leader" where the industry norm becomes best practice.

Appendix II
Traditional DC Plan - Markets

Markets Needs & Risks (Composite Rating: Red-Yellow) (includes both financial markets and intermediaries (e.g. insurers)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Efficiently priced	Market price is well understood and accepted by stakeholders. Plan does not contain features which cannot be efficiently priced. Plans incorporate discipline in pricing.	**Yellow** Pricing is transparent to plan sponsor; individuals may not understand market risks or fees associated with investment choices.	**Red-Yellow** Lack of incentive for sponsors to make hard choices about investment options and fees. Little incentive today for employers to disclose fees.
Efficient risk bearing	Plan efficiently pools idiosyncratic risks and hedges systematic risks (both economic and demographic).	**Red-Yellow** Benefits of mutual funds can lower costs of investing (although they tend to have high fees). Plans do not pool idiosyncratic risk, including longevity risk.	**Red-Yellow** Moral hazard not significant.
Allocation of risk	Plan efficiently allocates risk across stakeholders, giving each stakeholder the risk he can best bear.	**Red** Investment risks could be hedged although these investment options typically aren't offered or used. . Demographic risks could be hedged in theory but market instruments aren't available because managers haven't shown interest.	**Red** Moral hazard not significant.

Appendix III
Dutch Collective Career Pay Plan
About the Framework

About the plan[1] being evaluated:

- Career pay plan with accruals of 2% per year or higher, and may be offset by social insurance. A fixed benefit, generally the career pay benefit without indexation, is guaranteed. Indexation on the career pay benefits is made conditional to performance of the fund. The fund can "make up" past foregone indexation if superior funding levels achieved. For example, no indexation below a level of 85%, full indexation for funding levels at 105% and above and backlog indexation starts at funding levels of 125%.[2]
- Post-retirement indexation is also conditional on performance of the funds. Will be set using the same or similar policy assumptions as for indexation of career pay benefits.
- Pension fund is collective, either an occupational or industry collective and is self-sustaining. All employees are expected to join a fund, and all workers should have access to a fund. Almost all industries or occupations have these plans; there are a few private DB plans left but most individuals participate in these funds.
- Fund has a targeted funding level; if the fund falls below that level contributions are increased gradually; at higher levels contributions are reduced. Certain boundaries are defined by law (must pay actuarial premium if funding level is at or below 140%).
- Pension funds are generally invested in equities but measurements are at market rates. Typical fund mix might be 50% equities, 50% bonds.

About the ratings

- The overall ratings were done assuming a "perfect world" where actors understood and took advantage of the best features of plans. They do not consider moral hazard to stakeholders & agents.
- A second set of ratings were developed considering the effects of moral hazard. Moral hazard are defined in this application as when stakeholders (particularly individuals) can be led to not act in their own best interests based on a lack of understanding of features & consequences or, when agents take actions that don't align with interests of stakeholders, particularly individuals or shareholders/owners. While regulatory risk is its own category, we've considered regulatory risk as another adverse incentive (elected officials, including the judiciary, may be guilty of overzealous regulation, affecting the action of individuals, employers and the markets).

[1] We are evaluating the basic Dutch collective design. While certain elements of the design maybe more common in practice in the Netherlands (e.g. industry plans dominate, plans often have pay caps and offset with social insurance payments) we have focused instead on the basics of the plan design and broad governance features that are salient to the evaluation in the framework.
[2] From Policy Ladder example, Box 4.1, Kakes, Jan and Dirk Broeders (eds), *Occasional Studies, Vol 4. No 6* "The sustainability of the Dutch pension system," De Nederlandsche Bank (2006).

Appendix III
Dutch Collective Career Pay Plan
About the Framework

About the categories

- Each of the stakeholder categories has a different number of subcategories, from 6 to 11 subcategories.
- The example below shows you how to read the summary of the society category, with both the composite and sub-category ratings.

The average rating of yellow-green is a composite of the ten society subcategories.

The ratings for the ten-subcategories are shown in the color line. They are color grouped so you can see how many of each rating were received.

Ratings for each subcategory were adjusted for the effects of moral hazard. This shows the new composite rating after moral hazard as well as the new color line.

Society (composite rating)	Meets society's needs and risks.	**Yellow-Green** Individual criteria ratings: Plans rely on social trust and intergenerational solidarity. Profession or industry wide designs improve coverage and ensuring coverage in case of job changes. Self-adjusting mechanisms handle most risks.	**Yellow** Individual criteria ratings after moral hazard: May be strong temptation for agents to take risks as they can be pushed to future generations. What happens in case of severe market shock, industry decline or demographic shifts?

Appendix III
Dutch Collective Career Pay Plan - Summary

Summary			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Society (composite rating)	Meets society's needs and risks.	**Yellow-Green** Individual criteria ratings: Plans rely on social trust and intergenerational solidarity. Profession or industry wide designs improve coverage and ensuring coverage in case of job changes. Self-adjusting mechanisms handle most risks.	**Yellow** Individual criteria ratings after moral hazard: May be strong temptation for agents to take risks as they can be pushed to future generations. What happens in case of severe market shock, industry decline or demographic shifts?
Individuals (composite rating)	Meets individuals' needs and risks.	**Yellow-Green** Individual criteria ratings: Traditional DB features help individuals prepare for secure retirement without significant knowledge. Risk sharing mechanisms are complex and may not be well understood.	**Yellow** Individual criteria ratings after moral hazard: Individuals could be at risk if plans not well run; may not understand correlation of risks with market events.

Appendix III
Dutch Collective Career Pay Plan - Summary

Summary			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Employers (composite rating)	Meets employers' needs and risks.	**Yellow-Green** Individual criteria ratings: Employer can participate in well-run plan without risk of sponsorship, although employer could elect to sponsor a plan. Presence of industry wide plans minimizes benefits as competitive tool.	**Yellow-Green** Individual criteria ratings after moral hazard: Employers don't face moral hazard risks as they are not plan sponsor. Could be risk that government or courts try to make employers responsible should plans fail.
Markets (composite rating)	Meets markets' needs and risks.	**Yellow-Green** Individual criteria ratings: Plans are large and run by professionals and have access to sophisticated investments and hedges.	**Yellow** Individual criteria ratings after moral hazard: Risk that hedges won't be used as plans try to use equity investments to generate inflation indexing.

Appendix III
Dutch Collective Career Pay Plan - Society

Society's Needs & Risks (Composite Rating: Yellow-Green)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Adequate	Protects vulnerable citizens.	**Green** Establishment of plans by industry group/occupation can ensure widespread access, consistent coverage and adequate benefit levels.	**Yellow-Green** Does not rely on employer paternalism to maintain benefit levels. Conditional indexation could negatively affect adequacy.
Affordable	Does not take resources from other social needs. Ensures risk pooling done efficiently.	**Yellow-Green** Collective sponsorship does not put cost burden on state. Plans generally take equity risk so unclear what happens in extreme market events.	**Yellow** Inter-generational aspects may cause agents to take too many risks pushing costs to younger workers in an attempt to keep costs down. Will taxpayers be required to bail out the plans during extreme market events?
Sustainable	Sustainable across and within generations. Equitable across and within generations.	**Yellow-Green** Plans are designed to allocate costs to generation, but because of how the plans typically take investment risks, could see workers paying some costs for retirees (plan may be over-reliant on streams of new workers).	**Yellow** Significant risk that agents take risk to reduce costs for current generation increasing cost for future generation, or leading to plan demise.
Robust	Fair, covers great majority, creates shared economic growth, avoids moral hazard	**Green** Provide benefits across all income strata, use markets efficiently through group investing and expertise of well trained advisors.	**Yellow-Green** Self-adjusting mechanisms could deter use of hedging mechanisms.

Retirement 20/20 Measurement Framework

Appendix III
Dutch Collective Career Pay Plan - Society

Society's Needs & Risks (Composite Rating: Yellow-Green)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Does not promote economic risk	Efficiently allocates resources and encourages labor force participation.	**Green** Lack of early retirement subsidies and career pay formula encourage older workers to stay in labor force.	**Yellow** Presence of industry plans could hinder movement of workers out of dying industries and could put plans of dying industries at risk.
Does not promote political risk	Promotes fiscal/political integrity and political stability.	**Yellow** System will need oversight which will attract attention of politicians. Limitations on contributions could deter ability of plan to adjust for poor investment returns.	**Red-Yellow** Can create rifts between generations as younger generations may have to finance risks borne by previous generations.
Does not lead to system failure	Withstands shocks, not prone to instability or moral hazard.	**Yellow-Green** Self-adjusting mechanisms allow plans to ride out most risks. Career pay formula easier to adjust. Adjustment mechanisms may not be able to handle extreme events.	**Yellow** How well can self-adjusting mechanisms handle demographic shifts or declines in industry? If minimum guarantees aren't hedged, will they be borne by future generations?
Addresses imperfections of other stakeholders	Promotes strong individual decision making and covers lack of market instruments.	**Yellow-Green** Lack of lump sum payments, use of group investment pool are positives. Individuals may not understand conditional elements of system, and control by joint employer/employee boards (without significant professional advice) could lead to adverse outcomes.	**Yellow-Green** Moral hazard not significant.

Appendix III
Dutch Collective Career Pay Plan - Society

Society's Needs & Risks (Composite Rating: Yellow-Green)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Promote social solidarity and integrity	Ensures basic standards of living; ensures risks are shared.	**Yellow-Green** Social solidarity through collective responsibility, including intergenerational guarantees. Near universal adoption ensures acceptance by citizens.	**Yellow** What happens when a plan fails due to bad management, industry decline or a market decline causes widespread decline of plans?
Adjusts to changing demo-graphic and economic conditions	As demographic and economic conditions shift, plan can respond to meet societal needs.	**Yellow-Green** While plan includes self-adjusting mechanisms that adjust for economic shifts, not clear how it would handle economic downturn. Not clear how plan would adjust for increasing longevity although should be able to use conditional indexation.	**Yellow** How well is plan prepared for catastrophic shifts?

Appendix III
Dutch Collective Career Pay Plan - Individuals

Individual's Needs & Risks (Composite Rating: Yellow-Green)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Guaranteed income	Provides substantial level of income protection.	**Green** Individuals can obtain career long coverage, with pre- and post-retirement inflation indexation.	**Yellow** Benefits could be reduced during severe economic downturn. If guarantees are not hedged, minimum benefits could be at risk. Relies heavily on the ability of ALM models which can underestimate severity of tail events.
Predictability of income	Facilitates retirement planning.	**Yellow-Green** Benefit indexation is conditional, which means benefits aren't completely known until retirement, although should be well enough known for planning.	**Yellow** Individual benefits could be at risk if there is a significant negative market shock close to retirement.
Retirement flexibility	Allows choice of retirement age, including possibility to phase into retirement.	**Yellow-Green** Choice on retirement age; early retirement reductions are actuarially neutral. As we understand, participants cannot phase into retirement.	**Yellow-Green** Moral hazard not significant.
Portability	Minimizes loss upon employment termination.	**Yellow-Green** Consistency of plan across industry or across occupation decreases leakage upon termination. Career pay benefit eases switching between careers.	**Yellow-Green** No lump sums available. Moral hazard not significant.

Appendix III
Dutch Collective Career Pay Plan - Individuals

Individual's Needs & Risks (Composite Rating: Yellow-Green)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Sensitive to employment conditions	Benefits may vary in line with employment conditions.	**Yellow-Green** Industry wide plans allow consistency within industry, but may have different needs across employers.	**Yellow** If the industry suffers a decline, will benefit accruals decrease? Will the contributions be able to continue to fund the conditional indexation on past (higher) accrual levels?
Sensitive to family needs	Benefits may vary in line with spousal and children needs.	**Green** Automatically provides spouse and children protection.	**Yellow-Green** Presence of free joint & survivor benefits helps spouses, but does that give married participants an unfair benefit relative to unmarried participants?
Requirement for individual skills	Level of knowledge required to plan for retirement.	**Yellow-Green** Requires some sophistication to understand how self-adjusting mechanisms work and how this may affect benefit levels before and after retirement.	**Yellow** Individuals may not understand how risk of indexation may increase in times of economic stress (market downturns, high inflation).
Investment risk	Protects against fluctuations in market returns.	**Yellow-Green** There is a minimum guarantee. Investment risk shared by workers and retirees through conditional indexation; provisions to repay foregone indexation when markets improve.	**Red-Yellow** Would the minimum guarantee be at danger in an extreme market event?

Appendix III
Dutch Collective Career Pay Plan - Individuals

Individual's Needs & Risks (Composite Rating: Yellow-Green)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Longevity risk	Protects against possibility to outlive assets.	**Yellow-Green** Individual risk effectively pooled. Systematic risk shared by workers and retirees (if plan's policy ladder based on funded status), although workers will likely take a larger share.	**Yellow-Green** Moral hazard not significant.
Inflation risk	Includes both pre and post retirement inflation.	**Yellow-Green** Offers conditional indexation pre-and post-retirement. Could put individuals at risk if periods of high inflation are associated with periods of poor investment return.	**Yellow** Would agents take more risk in times of high inflation or after negative market events to try to improve inflation indexation?
Premature retirement risk	Protects against forced early retirement due to disability, family circumstances, and involuntary termination.	**Yellow** Plan could provide for disability benefits. Employer cannot use plan to provide soft landing in case of an employer economic event.	**Red-Yellow** In the case of a large scale industry downturn, could the "run on the plan" create instability?

Appendix III
Dutch Collective Career Pay Plan - Employer

Employer Needs & Risks (Composite Rating: Yellow-Green)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Supports primary business purpose	Enhances core purpose of the employer's business.	**Green** Employer can focus on core business and not managing plan. Employers can elect to sponsor plan if wish to have differentiation.	**Yellow-Green** Would employers be tempted to sponsor a plan and take additional risk in an attempt to reduce cost?
Workforce management: attraction & retention	Enhances business value by allowing attraction and retention of the "right employees".	**Green** Employers have a choice to sponsor own plan or participate in industry-wide plan. Industry-wide plans eliminate pensions as means of competitive advantage.	**Green** Moral hazard has minimal effect.
Workforce management: transition of employees	Enhances business value by facilitating the orderly transition of employees.	**Yellow** Plans are designed to be retirement age neutral. If don't sponsor own plan, would have to use other means to encourage early retirement.	**Yellow** Moral hazard has minimum effect.
Supports new norms for work and retirement	As needed, supports shifting norms for work and retirement, e.g. phased retirement, return to work, etc.	**Yellow-Green** Plan is neutral to retirement age, and career pay benefits are not dependent on long period working for a single employer. Unclear how it supports phased retirement but could do so.	**Yellow-Green** Moral hazard not significant.

Appendix III
Dutch Collective Career Pay Plan - Employer

Employer Needs & Risks (Composite Rating: Yellow-Green)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Responsive to owners	Responds to needs of owners, e.g., shareholders for public companies, which may limit amount of risk to be taken.	**Yellow** Contribution levels not set by employers, so they may be faced with higher costs when unable to pay them for other business reasons. Only choice would be to push to employees which may not be feasible.	**Red-Yellow** In case of market downturn or severe economic event, would employers be asked to step in and rescue plans?
Business risk	Ability to react quickly to changes in the competitive landscape.	**Yellow** Contribution rates could increase during times of economic downturn forcing employers who cover contributions to make difficult choices.	**Red-Yellow** If industry were to decline, would remaining employers be expected to increase contributions as competitors failed?
Regulatory risk	Allows plan to be operated to fit needs and change to meet conditions easily within regulatory framework.	**Green** Employer is not sponsor and would bear no regulatory risk (unless they elect to sponsor the plan).	**Yellow-Green** Could face risk that regulations change over time to put risk back to employers.
Fiduciary risk	Allows plan to be easily operated to minimize fiduciary liability.	**Green** Employer is not sponsor and would bear no fiduciary risk (unless they elect to sponsor the plan).	**Green** Moral hazard has minimal effect.

Appendix III
Dutch Collective Career Pay Plan - Employer

Employer Needs & Risks (Composite Rating: Yellow-Green)			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Litigation risk	Allows management of plan to avoid lawsuits.	**Yellow-Green** Employer is not sponsor and would bear no legal risk (unless they elect to sponsor the plan). However plan decline could put all sponsors within an industry at risk for litigation.	**Yellow-Green** Moral hazard (beyond risk of total plan failure) not significant.

Appendix III
Dutch Collective Career Pay Plan - Markets

Markets Needs & Risks (Composite Rating: Yellow-Green) (includes both financial markets and intermediaries (e.g. insurers))			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Maximizes use of markets	Effectively uses markets and hedging mechanisms; stakeholders can purchase hedging instruments cost effectively.	**Yellow-Green** Large size of plans and ability to hire professional expertise allows plans to make sophisticated investments on cost effective basis and have access to available hedges. Limited long-term and inflation linked hedges available.	**Yellow** Agents may not make use of available hedges because they may increase cost of plan.
Transparent (cost)	Costs of plan are transparent (fees, costs to sponsors, other stakeholders, etc).	**Green** Costs can be transparent.	**Yellow** Does the third-party board have full responsibility to employers and employees? Are costs as transparent as they could be? Will the plans be able to transparently disclose how self-adjusting mechanisms work?
Strong Governance	Fiduciary roles of plan sponsors well defined. Plan structure minimizes agency issues, particularly regarding plan investment and risk taking.	**Green** Well defined structure in terms of how contributions and indexing will be adjusted based on level of plan funding. Presence of self-adjusting mechanisms mean agents cannot "hide" performance of plan from participants.	**Yellow-Green** Not clear how benefits or contributions are adjusted should funding levels fall so minimum benefits can't be paid.

Appendix III
Dutch Collective Career Pay Plan - Markets

Markets Needs & Risks (Composite Rating: Yellow-Green ■) (includes both financial markets and intermediaries (e.g. insurers))			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Efficiently priced	Market price is well understood and accepted by stakeholders. Plan does not contain features which cannot be efficiently priced. Plans incorporate discipline in pricing.	**Yellow** Uses market pricing to determine funding levels. Lack of early retirement subsidies or other features. Participants may not completely understand how self-adjusting mechanisms work.	**Red-Yellow** Will there be pressure to move away from efficient pricing if there is a market crisis, demographic shift or industry decline? May be too much reliance on intergenerational risk sharing.
Efficient risk bearing	Plan efficiently pools idiosyncratic risks and hedges systematic risks (both economic and demographic).	**Yellow-Green** Self adjusting mechanisms spread effect of risk back to participants immediately; mechanisms are described in design and not developed as needed. Lack of market instruments available to hedge systematic risks.	**Yellow** Managers tend not to choose risk hedging instruments. Managers may be tempted to choose risky investments to meet inflation promise putting future generations at risk.
Allocation of risk	Plan efficiently allocates risk across stakeholders, giving each stakeholder the risk he can best bear.	**Yellow** Plan allocates risk, but all risk is allocated in a similar fashion, with no differentiation as to their tolerance for risk.	**Red-Yellow** In extreme events, plan may bend to pressure to preserve retiree indexation or reduce active contributions, thereby increasing risk allocation.

Appendix IV
Ontario Teachers' Pension Plan (OTPP)
About the Framework

About the plan being evaluated:

- This plan covers all non-university teachers, in public and certain private schools, and those who work in certain teaching related organizations in the province of Ontario. As of 31 December 2007 the plan had $CN 108.5 billion in assets and $CN 115.4 in liabilities (on an accrued benefits basis).
- Benefits are 2% per year of service multiplied by final average salary (five year average). The benefit is integrated with the Canada Pension Plan (CPP – Canadian social insurance). Benefits are fully inflation indexed, and are payable to members and survivors as life annuities. Accrued benefits are protected (the plan may change the plan formula for future service).
- Contributions are made equally by teachers, the government and other employers each fund half the cost of the plan (in 2007 teachers paid $CN1.0 billion, the Ontario government $CN 1.1 billion and other employers $CN 38 million). The employee contribution level for 2007 was 7.3% of pay up to the CPP Maximum Pensionable Earnings and 8.9% of pay thereafter.
- The OTPP is an independent corporation. It is managed by a Board with members nominated equally by the Ontario Teachers' Federation (OTF) and the Ontario Ministry of Education. They jointly set benefit levels, contribution rates for teachers (which are matched by the government and other employers) and how any shortfalls or surpluses are addressed. Board members are retirement professionals appointed by the OTF and Ministry of Education (not union officials or politicians).
- The plan was recently updated to modify the inflation index to make 50% of the inflation increase conditional on fund performance, longevity improvements and other factors. In any year where the full inflation increase is not provided, the government and other employers will contribute the amount foregone as an additional contribution (to maintain the 50/50 cost sharing in the plan).

About the ratings

- The overall ratings were done assuming a "perfect world" where actors understood and took advantage of the best features of plans. They do not consider moral hazard affecting stakeholders & agents.
- A second set of ratings were developed considering the effects of moral hazard. Moral hazard are defined in this application as when stakeholders (particularly individuals) can be led to not act in their own best interests based on a lack of understanding of features & consequences or, when agents take actions that don't align with interests of stakeholders, particularly individuals or shareholders/owners. While regulatory risk is its own category, we've considered regulatory risk as another a (elected officials, including the judiciary, may be guilty of overzealous regulation, affecting the action of individuals, employers and the markets).

Appendix IV
Ontario Teachers' Pension Plan (OTPP)
About the Framework

About the categories

- Each of the stakeholder categories has a different number of subcategories, from 6 to 11 subcategories.
- The example below shows you how to read the summary of the employer category, with both the composite and sub-category ratings.

The average rating of yellow-green is a composite of the nine employer subcategories.

The ratings for the nine-subcategories are shown in the color line. They are color grouped so you can see how many of each rating were received.

Ratings for each subcategory were adjusted for the effects of moral hazard. This shows the new composite rating after moral hazard as well as the new color line.

Criteria	Objective	Evaluation	Effect of moral hazard
Employers (composite rating)	Meets employers' needs and risks.	**Yellow-Green** Individual criteria ratings: By removing sponsorship from individual school boards and vesting it with an independent corporation, eliminate conflict of interests between the operation of the core business and the operation of the plan. Plan also benefits from operating in the public arena.	**Yellow** Individual criteria ratings after moral hazard: Adjustments to the self-regulating mechanisms could potentially subject participants to increasing risk without their knowledge.

Appendix IV
Ontario Teachers' Pension Plan (OTPP) - Summary

Summary			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Society (composite rating)	Meets society's needs and risks.	**Yellow-Green** Individual criteria ratings: Structure of plan, with costs and control shared by teachers and government, means plan does well meeting social goals without putting future taxpayers at risk (any increase in benefits is borne by this generation of taxpayers). Plan also covers all teachers in Ontario, ensuring continuity of coverage and that individual school boards spend time educating students not running a pension plan.	**Yellow** Individual criteria ratings after moral hazard: The strength of the plan is only as good as the governance structure. To date, government and union have been committed to appointing professional trustees. If that commitment changed, and Board appointments were politicized, plan experience could be different. An all-Ontario teachers strike poses significant political risk.
Individuals (composite rating)	Meets individuals' needs and risks.	**Green** Individual criteria ratings: Plan includes many of the best features of defined benefit plans, including inflation protection and no lump sums. Board equally weighted by teachers and government	**Yellow-Green** Individual criteria ratings after moral hazard: Individuals could be at risk if the Board became politicized or took untoward risks in an attempt to reduce contributions or increase benefits.

Appendix IV
Ontario Teachers' Pension Plan (OTPP) - Summary

Summary			
Criteria	**Objective**	**Evaluation**	**Effect of moral hazard**
Employers (composite rating)	Meets employers' needs and risks.	**Yellow-Green** Individual criteria ratings: By removing sponsorship from individual school boards and vesting it with an independent corporation, eliminate conflict of interests between the operation of the core business and the operation of the plan. Plan also benefits from operating in the public arena.	**Yellow** Individual criteria ratings after moral hazard: Adjustments to the self-regulating mechanisms could potentially subject participants to increasing risk without their knowledge.
Markets (composite rating)	Meets markets' needs and risks.	**Yellow-Green** Individual criteria ratings: Plan incorporates the best features of institutional investing and its independent structure means that it's not subject to agency risk. Plan assumes all participants (workers and retirees) and all contributing employers can assume the same level of risk.	**Yellow-Green** Individual criteria ratings after moral hazard: The strength of the plan is the strength of its governance structure. Plan could take better advantage of available hedges.

Appendix IV
Ontario Teachers' Pension Plan (OTPP) - Society

Society's Needs & Risks (Composite rating: Yellow-Green)			
Criteria	**Description**	**Evaluation**	**Effect of moral hazard**
Adequate	Protects vulnerable citizens.	**Green** Generous formula, based on final pay, integrates with CPP, and includes inflation protection (with some risk-sharing in the inflation protection).	**Green** Because benefit level decisions and benefit funding are shared equally by teachers and the government, less likelihood of benefit levels declining "on the employer whim." Little significant moral hazard under current governance structure.
Affordable	Does not take resources from other social needs. Ensures risk pooling done efficiently.	**Yellow-Green** Sharing of costs between teachers and government lessens likelihood of taxpayers being asked to fund expensive benefit improvements at the whim of the teachers union (Cost increases are borne by current taxpayers, so politicians are immediately accountable for any increases). Fund size pools risks effectively.	**Yellow** Potential for the Board to trade hedging for riskier investment returns, although less likely due to cost sharing. Plan may be making commitments regarding future cost that future taxpayers/participants may not be willing to pay.
Sustainable	Sustainable across and within generations. Equitable across and within generations.	**Green** Can be funded to directly allocate costs back to the current generation of taxpayers/teachers.	**Yellow** Can be tempting to push costs to future generations of teachers/ taxpayers. Fund is facing significant demographic issues with maturation of plan and retirement of baby boom. Provisions that allow teachers to return to work and collect a pension could affect fund stability.

Appendix IV
Ontario Teachers' Pension Plan (OTPP) - Society

Society's Needs & Risks (Composite rating: Yellow-Green)			
Criteria	**Description**	**Evaluation**	**Effect of moral hazard**
Robust	Fair, covers great majority, creates shared economic growth, avoids moral hazard	**Green** Uses markets efficiently through group investing and expertise of well trained advisors. All teachers are covered by equivalent plan, avoiding cost and expense of "competing benefits" in various school districts.	**Yellow** Board control equally by union and government minimizes likelihood of significant increase or decrease in future benefits. Taxpayers may not have same sentiment about cost increases as do government representatives.
Does not promote economic risk	Efficiently allocates resources and encourages labor force participation.	**Yellow** Plan contains generous early retirement features introduced decades earlier to encourage retirement which are now part of the accrued benefit and may not work to retain teachers in the future.	**Red-Yellow** Teachers can return to work and collect full pension.
Does not promote political risk	Promotes fiscal/political integrity and political stability.	**Yellow-Green** 50/50 contributions ensures government stays "honest" and pays their share each year, rather than balancing the books by foregoing pension contributions. Government can use plan to curry favor with teachers union.	**Red-Yellow** If Board appointment process changed, government could use the plan to curry favor with the teachers union in an attempt to win votes. An all-Ontario teachers strike or threat thereof could create political instability for government.
Does not lead to system failure	Withstands shocks, not prone to instability or moral hazard.	**Yellow-Green** Board can decrease benefit levels/increase contribution levels (before system collapse) and new provisions to share risk with retirees should increase ability to withstand shock. Structure of Board discourages moral hazard.	**Red-Yellow** Can risk-adjusting mechanisms withstand market shocks?

Appendix IV
Ontario Teachers' Pension Plan (OTPP) - Society

Society's Needs & Risks (Composite rating: Yellow-Green)			
Criteria	**Description**	**Evaluation**	**Effect of moral hazard**
Addresses imperfections of other stakeholders	Promotes strong individual decision making and covers lack of market instruments.	**Green** Plan has access to market instruments and makes investment decisions on behalf of participants. Benefits have survivor protection built in, and are not available as lump sums.	**Green** Moral hazard not significant.
Promote social solidarity and integrity	Ensures basic standards of living; ensures risks are shared.	**Green** Single plan for all teachers encourages solidarity within profession in Ontario. Risk sharing between government and teachers.	**Green** Moral hazard not significant.
Adjusts to changing demo-graphic and economic conditions	As demographic and economic conditions shift, plan can respond to meet societal needs.	**Yellow-Green** Plan has fixed retirement ages and generous early retirement provisions. Allows workers to retire during downturns. Conditional indexation for retirees means that working teachers and taxpayers won't bear full cost of economic declines.	**Yellow** Generous benefits and a large number of retirees mean Board must carefully manage plan as demographic and economic shifts could create plan stresses.

Appendix IV
Ontario Teachers' Pension Plan (OTPP) - Individuals

Individual's Needs & Risks (Composite rating: Green ■)			
Criteria	**Description**	**Evaluation**	**Effect of moral hazard**
Guaranteed income	Provides substantial level of income protection.	**Green** Benefit promise is well defined and based on final pay (income security). Service covered for (most) any teaching position in Ontario. There are limited service buy-back provisions as well.	**Yellow-Green** Plan is an independent entity and facing plan maturation and the retirement of the baby boom. Have made provisions to adjust benefits for retirees as well, but plan must be carefully managed to ensure ability to pay future benefits.
Predictability of income	Facilitates retirement planning.	**Green** Fixed promise allows for retirement planning.	**Yellow-Green** Again, if not plan is not well managed, benefits could decline over time or retirees could see benefits cut. Risk sharing mechanisms are in place to reduce this risk relative to traditional corporate or public plan.
Retirement flexibility	Allows choice of retirement age, including possibility to phase into retirement.	**Yellow-Green** Nature of group and their solidarity means participants have high understanding of early retirement provisions. Phased retirement not available.	**Yellow** Teachers can continue to teach and take a pension.
Portability	Minimizes loss upon employment termination.	**Yellow-Green** Full portability if individual remains in teaching profession and within the province of Ontario, providing significant career latitude (although not portable if leave teaching). Some portability for transferring credit to other plans.	**Yellow-Green** Lump sums only payable to those with less than 2 years of service (of contributions with interest) so moral hazard not significant.

Appendix IV
Ontario Teachers' Pension Plan (OTPP) - Individuals

Individual's Needs & Risks (Composite rating: Green)			
Criteria	**Description**	**Evaluation**	**Effect of moral hazard**
Sensitive to employment conditions	Benefits may vary in line with employment conditions.	**Green** Because plan is focused on position, plan covers individuals with similar needs regarding retirement.	**Yellow-Green** Early retirement provisions introduced to retire pre-baby boom teachers to retire no longer appropriate.
Sensitive to family needs	Benefits may vary in line with spousal and children needs.	**Green** Provides full benefits to survivors.	**Green** Moral hazard not significant.
Requirement for individual skills	Level of knowledge required to plan for retirement.	**Green** Only requires understanding of various benefits offered (not required to convert single sum to annuity stream, or know the level of single sum required).	**Green** Moral hazard not significant (no presence of lump sum in plan).
Investment risk	Protects against fluctuations in market returns.	**Yellow-Green** Risk shared by teachers and government in the form of higher contributions and/or reduced inflationary increases.	**Yellow** If Board makes risky investments, teachers can lose some benefits without realizing the risk they faced. Less likelihood of this with professional Board appointed equally by government and teachers.
Longevity risk	Protects against possibility to outlive assets.	**Yellow-Green** Idiosyncratic risk is effectively pooled, but workers, future retirees and employers share the systematic risk, which is significant because benefits are inflation indexed..	**Yellow-Green** Moral hazard not significant (no lump sums paid).

Appendix IV
Ontario Teachers' Pension Plan (OTPP) - Individuals

Individual's Needs & Risks (Composite rating: Green ■)			
Criteria	**Description**	**Evaluation**	**Effect of moral hazard**
Inflation risk	Includes both pre and post retirement inflation.	**Green** Final pay offers pre-retirement inflation protection, and post-retirement inflation indexing. Some portion of post-retirement inflation index at risk, but 50% of inflation is guaranteed.	**Yellow-Green** Adjustments to benefits post-retirement for inflation risk likely not well understood. Due to self-adjusting mechanisms, inflation protection may be most at risk at times of economic stress.
Premature retirement risk	Protects against forced early retirement due to disability, family circumstances, and involuntary termination.	**Green** Plan has early retirement and disability benefits. Early retirement reduction is roughly actuarially equivalent.	**Yellow-Green** Early retirement reductions often misunderstood and seen as a "take-away."

Appendix IV
Ontario Teachers' Pension Plan (OTPP) - Employer

Employer Needs & Risks (Composite Rating: Yellow-Green)			
Criteria	**Description**	**Evaluation**	**Effect of moral hazard**
Supports primary business purpose	Enhances core purpose of the employer's business.	**Green** Consolidated plan independent of any employer relieves individual school boards of the responsibility of operation of the plan. One plan for all teachers in Ontario eliminates any benefit competition by neighboring districts.	**Green** Moral hazard not significant.
Workforce management: attraction & retention	Enhances business value by allowing attraction and retention of the "right employees".	**Yellow** Plan custom designed for teachers. Comparatively high contribution rate could be seen as negative by young teachers. If individual school boards have other needs will have to use other compensation incentives.	**Red-Yellow** Plan has been suspect in the past to politicians introducing features to solve current workforce issues, which then are baked into the accrued benefit. Current independent structure minimizes that likelihood.
Workforce management: transition of employees	Enhances business value by facilitating the orderly transition of employees.	**Yellow** Rule of 85 provision sends all teachers out as soon as they reach 85 points, giving no room for schools to incentivize teachers to work later.	**Red-Yellow** Teachers can take a pension and continue to teach, which diminishes workforce management.
Supports new norms for work and retirement	As needed, supports shifting norms for work and retirement, e.g. phased retirement, return to work, etc.	**Yellow** Teachers have continuity of plan no matter what teaching job they hold in Ontario. But, plan has no phased retirement and rule of 85 encourages early retirement.	**Red-Yellow** Provisions that allow teachers to work while still collecting pensions could negatively affect the system.

Appendix IV
Ontario Teachers' Pension Plan (OTPP) - Employer

Employer Needs & Risks (Composite Rating: Yellow-Green)			
Criteria	**Description**	**Evaluation**	**Effect of moral hazard**
Responsive to owners	Responds to needs of owners, e.g., shareholders for public companies, which may limit amount of risk to be taken.	**Yellow-Green** Equal cost sharing by taxpayers and teachers minimizes likelihood that future taxpayers alone will pay for today's risks, but temptation still exists to push costs to both future teachers and future taxpayers. Today, plan is very careful about not pushing costs forward.	**Yellow** Plan may minimize use of hedging instruments in search of higher investment return.
Business risk	Ability to react quickly to changes in the competitive landscape.	**Yellow** Can only reduce future accruals and phase out of benefits can take a long time. Ability to share costs by increasing contributions and reducing retirees' inflation increase. Plan is self-contained.	**Red-Yellow** Always a risk that Board won't act quickly enough or with enough foresight to forestall larger disasters. Plan has mechanisms in place to spread the pain.
Regulatory risk	Allows plan to be operated to fit needs and change to meet conditions easily within regulatory framework.	**Yellow-Green** Subject to provincial regulation as are other plans. Plan structure contains significant self-regulating mechanisms.	**Yellow** Changes in structure to lessen self-regulating mechanisms could add volatility and decrease reliability of benefits without participants realizing the effect.
Fiduciary risk	Allows plan to be easily operated to minimize fiduciary liability.	**Green** Individual school boards bear NO fiduciary risk. Plan is an independent corporation.	**Green** Moral hazard not significant.

Appendix IV
Ontario Teachers' Pension Plan (OTPP) - Employer

Employer Needs & Risks (Composite Rating: Yellow-Green)			
Criteria	**Description**	**Evaluation**	**Effect of moral hazard**
Litigation risk	Allows management of plan to avoid lawsuits.	**Yellow-Green** Plan is an independent corporation, cosponsored by the Government of Ontario. Litigation on the plan would have no effect on individual school boards.	**Yellow-Green** Plan benefits less at risk than typical corporate DB plan because of presence of union and government on governing Board.

Appendix IV
Ontario Teachers' Pension Plan (OTPP) - Markets

Markets Needs & Risks (Composite Rating: Green) (includes both financial markets and intermediaries (e.g. insurers))			
Criteria	**Description**	**Evaluation**	**Effect of moral hazard**
Maximizes use of markets	Effectively uses markets and hedging mechanisms; stakeholders can purchase hedging instruments cost effectively.	**Yellow-Green** Economic hedges are available and plan is of sufficient size and with sophisticated buyers so may take advantage of them. Demographic hedges not widely available.	**Yellow** Economic hedges are widely available but not used, even with a growing retiree population.
Transparent (cost)	Costs of plan are transparent (fees, costs to sponsors, other stakeholders, etc).	**Green** The 50/50 cost structure (union/public) and balanced Board keep costs transparent.	**Green** Moral hazard not significant.
Strong Governance	Fiduciary roles of plan sponsors well defined. Plan structure minimizes agency issues, particularly regarding plan investment and risk taking.	**Green** Governance is exceptionally strong, with a Board of retirement professionals appointed evenly by teachers and Government. Significant self-regulating mechanisms are in place and there has been no move to remove or weaken them.	**Green** Plan has shown leadership in the area of governance.
Efficiently priced	Market price is well understood and accepted by stakeholders. Plan does not contain features which cannot be efficiently priced. Plans incorporate discipline in pricing.	**Yellow-Green** Plan does contain early retirement subsidies and other features which are difficult to price. Plan uses market based assumptions and has been aggressive about projecting mortality improvements due to the fact that there is no sponsor to fall back on should contributions be insufficient.	**Yellow-Green** Independence of plan, strong policies and professional retirement board minimize opportunities for managers to misprice.

Appendix IV
Ontario Teachers' Pension Plan (OTPP) - Markets

Markets Needs & Risks (Composite Rating: Green ■) (includes both financial markets and intermediaries (e.g. insurers))			
Criteria	**Description**	**Evaluation**	**Effect of moral hazard**
Efficient risk bearing	Plan efficiently pools idiosyncratic risks and hedges systematic risks (both economic and demographic).	**Yellow-Green** Plan efficiently pools longevity and many other retirement risks. Plan can effectively hedge investment risks although instruments aren't there for systematic longevity risks (size of plan means it will be able to be a market leader, should they be developed).	**Red-Yellow** Risk-adjusting mechanisms may incentivize trustees to not use hedges where appropriate, creating more exposure to extreme events.
Allocation of risk	Plan efficiently allocates risk across stakeholders, giving each stakeholder the risk he can best bear.	**Yellow** Costs are borne equally by teachers and taxpayers; new mechanisms to allow for reduction in inflationary increases mean that retirees will now share in the risk of the plan. However, plan assumes all members (retirees and workers, and all employers) have the same tolerance for risk.	**Red-Yellow** Demographics work against the plan – with fewer teachers and more retirees, plan will have to be more aggressive in management to avoid spreading too much risk back to retirees. In general, may be best to hedge retiree liabilities but mix of actives and retirees in same plan may make it difficult to judge where risk should be taken and where hedging should occur.

Appendix V
United Methodist Church (UMC) Plan
About the Framework

About the plan being evaluated:

- This is a multiemployer, church-sponsored defined benefit plan, with a final pay formula that is based on average pay of all clergy across the United States (rather than individual pay). Benefits are inflation indexed. Clergy have access to Social Security benefits (unless they decided, as individuals, to opt out).
- General Board of Pensions makes investment decisions, sets contribution levels and makes recommendations to the convention. Most of the Board is elected from the general membership but a few positions are appointed based on expertise. There are additional ad-hoc members, appointed for the expertise, who serve on Board committees.
- Participation is mandatory for all regional conferences (regional groupings of local churches, roughly akin to states; there are 63 in total). Regional conferences do not control benefit design, investment policy, or aggregate contribution levels.
- Any and all plan changes can be made only by an elected committee of 1,000 delegates that meets for 2 weeks once every 4 years. By definition, half of the delegates are clergy. That committee makes all decisions that are made on behalf of the worldwide and/or national church.
- Joint and survivor benefits are fully subsidized. Subsidized early retirement is available after 40 years of service. There is a maximum retirement age of 72. Lump sums are not available.
- US Internal Revenue Code provides little or no regulation related to plan design and funding. There is no government guaranty fund.

About the ratings

- The overall ratings were done assuming a “perfect world” where actors understood and took advantage of the best features of plans. They do not consider moral hazard on behalf of stakeholders & agents.
- A second set of ratings were developed considering the effects of moral hazard. Moral hazard in defined in this application as when stakeholders (particularly individuals) can be led to not act in their own best interests based on a lack of understanding of features & consequences or, when agents take actions that don’t with interests of stakeholders, particularly individuals or shareholders/owners. While regulatory risk is its own category, we’ve considered regulatory risk as another moral hazard (elected officials, including the judiciary, may be guilty of overzealous regulation, affecting the action of individuals, employers and the markets).

Appendix V
United Methodist Church (UMC) Plan
About the Framework

About the categories

- Four categories have a single rating: self-adjusting, aligns roles with skills, new norms for work and retirement, alignment with markets. Four other categories, which are based on how well the plan meets the needs of the four key stakeholders, have sub-categories with a composite rating. The four stakeholders are society, individuals, employers and markets. The summary page shows both the composite rating and ratings in the subcategories.
- Each of the stakeholder categories has a different number of subcategories, from 6 to 11 subcategories.
- The example below shows you how to read the summary of the stakeholder category, with both the composite and sub-category ratings.

The average rating of green is a composite of the ten society subcategories.

The ratings for the ten-subcategories are shown in the color line. They are color grouped so you can see how many of each rating were received.

Ratings for each subcategory were adjusted for the effects of moral hazard. This shows the new composite rating after moral hazard is considered as well as a new color line.

Society (composite rating)	Meets society's needs and risks.	**Green** Individual criteria ratings:  Plans protect long-service workers well avoiding the need for more government sponsored benefits.	**Yellow-Green** Individual criteria ratings after moral hazard:  Church culture has strong sense of paternalism and equity.

Appendix V
United Methodist Church (UMC) Plan - Summary

Summary			
Criteria	**Description**	**Evaluation**	**Effect of moral hazard**
Society (composite rating)	Meets society's needs and risks.	**Green** Individual criteria ratings: Plans protect long-service workers well avoiding the need for more government sponsored benefits.	**Yellow-Green** Individual criteria ratings after moral hazard: Church culture has strong sense of paternalism and equity.
Individuals (composite rating)	Meets individuals' needs and risks.	**Green** Individual criteria ratings: Benefits well designed to function with need for individual understanding; benefits fit culture well.	**Yellow-Green** Individual criteria ratings after moral hazard: Under different leadership, political pressure could decrease contributions and benefits could be more at risk.
Employers (composite rating)	Meets employers' needs and risks.	**Yellow-Green** Individual criteria ratings: Plan shades individual congregations and conferences from having to run pension fund, but the church itself faces typical employer risks.	**Yellow** Individual criteria ratings after moral hazard: Under different leadership, the plan could end up taking more risk, putting future generations of congregants at risk.

Appendix V
United Methodist Church (UMC) Plan - Summary

Summary			
Criteria	**Description**	**Evaluation**	**Effect of moral hazard**
Markets (composite rating)	Meets markets' needs and risks.	**Yellow-Green** Individual criteria ratings: Plan effectively pools risk across the entire church, and is run with Board heavily influenced by professionals.	**Yellow** Individual criteria ratings after moral hazard: Under different leadership, could get pressure to take more market risk, putting future generations of congregants and clergy at risk.

Appendix V
United Methodist Church (UMC) Plan - Society

Society's Needs & Risks (Composite Rating: Green ■)			
Criteria	**Description**	**Evaluation**	**Effect of moral hazard**
Adequate	Protects vulnerable citizens.	**Green** High degree of protection for the vast majority of the clergy population, who generally stay in profession once they enter the ministry (which tends to be mid-career or later).	**Green** Individual churches and/or plan sponsors have no choice in participation, benefit, or funding levels.
Affordable	Does not take resources from other social needs. Ensures risk pooling done efficiently.	**Yellow-Green** Does not put cost burden on state; pools risks across plan sponsors.	**Yellow** Managers may not use market hedging, preferring to gamble on market returns.
Sustainable	Sustainable across and within generations. Equitable across and within generations.	**Green** Can be funded to directly allocate costs back to the current generation of owners/shareholders.	**Yellow-Green** Can be tempting to push costs to future generations of owners/ shareholders, or to pre-fund at the expense of current generations.
Robust	Fair, covers great majority, creates shared economic growth, avoids moral hazards	**Green** DB plans provide benefits across income strata, use markets efficiently through group investing and expertise of well trained advisors.	**Yellow-Green** At the national level, there is opportunity for less-than optimal funding and investing policies.

Appendix V
United Methodist Church (UMC) Plan - Society

Society's Needs & Risks (Composite Rating: Green)			
Criteria	**Description**	**Evaluation**	**Effect of moral hazard**
Does not promote economic risk	Efficiently allocates resources and encourages labor force participation.	**Yellow-Green** Final pay plans may encourage employee retention, particularly among older employees, to reach a certain benefit level, but may be harder to encourage employees to work beyond a certain point.	**Yellow-Green** Moral hazard not significant.
Does not promote political risk	Promotes fiscal/political integrity and political stability.	**Yellow-Green** Lack of understanding can generate movements with in the Church to change the plan.	**Yellow** Could see tensions arising between Board that administers plan and regional conferences who must fund it.
Does not lead to system failure	Withstands shocks, not prone to instability or moral hazard.	**Yellow-Green** Benefit levels may be able to be changed before system collapse (if there is a 2-4 year window before potential collapse). .	**Red-Yellow** Participant representatives must vote to lower benefits.
Addresses imperfections of other stakeholders	Promotes strong individual decision making and covers lack of market instruments.	**Green** Plans have access to market instruments and makes investment decisions on behalf of participants. Benefits have survivor protection built-in and are not available as lump sums.	**Green** There are no individual participant or plan sponsor choices.

Appendix V
United Methodist Church (UMC) Plan - Society

Society's Needs & Risks (Composite Rating: Green ■)			
Criteria	**Description**	**Evaluation**	**Effect of moral hazard**
Promote social solidarity and integrity	Ensures basic standards of living; ensures risks are shared.	**Green** Multiemployer nature and uniform benefit level across the denomination encourages social solidarity and integrity. Can only encourage through tax subsidies.	**Green** Moral hazard not significant.
Adjusts to changing demo-graphic and economic conditions	As demographic and economic conditions shift, plan can respond to meet societal needs.	**Yellow-Green** The plan can be adjusted to change retirement ages, benefit levels retroactively, but requires vote of Committee (which includes plan participants).	**Yellow** Would clergy Committee participants be able to decrease their benefits for the good of future generations?

Appendix V
United Methodist Church (UMC) Plan - Individuals

Individual's Needs & Risks (Composite rating: Green ■)			
Criteria	**Description**	**Evaluation**	**Effect of moral hazard**
Guaranteed income	Provides substantial level of income protection.	**Yellow-Green** Benefit promise is well defined and based on average final pay (income security). For the few short service employees, benefits are often quite small and not related to final pay at retirement.	**Red-Yellow** If the plan becomes significantly underfunded, Committee (about half of whom are participants) may vote to terminate the plan (individuals close to or in retirement could lose some benefits). No insurance backstop.
Predictability of income	Facilitates retirement planning.	**Green** Fixed promise allows for retirement planning.	**Yellow-Green** If the plan becomes significantly underfunded, Committee (about half of whom are participants) may vote to terminate the plan (individuals close to or in retirement could lose some benefits).
Retirement flexibility	Allows choice of retirement age, including possibility to phase into retirement.	**Yellow-Green** Ability to choose retirement age within the church's limited range; individuals can not phase into retirement with partial benefits but church systems allow retirement and post-retirement employment within the system.	**Yellow** Early retirement reductions, while actuarially sound, are not easy to understand and can be perceived as unfair by employees, causing them to devalue the plan.
Portability	Minimizes loss upon employment termination.	**Yellow-Green** Most participants stay within plan once they enter ministry,and most of these retire from the plan.	**Yellow-Green** Moral hazard not significant.

Appendix V
United Methodist Church (UMC) Plan - Individuals

Individual's Needs & Risks (Composite rating: Green ■)			
Criteria	**Description**	**Evaluation**	**Effect of moral hazard**
Sensitive to employment conditions	Benefits may vary in line with employment conditions.	**Green** Benefits are designed for clergy specifically and reflect their employment conditions, which differ from most private and public sector employees.	**Yellow-Green** Church philosophies prevent different plan structures for different types of clergy even though employment systems vary among different types of clergy. The result is higher costs and benefits that are not philosophically consistent across groups of clergy.
Sensitive to family needs	Benefits may vary in line with spousal and children needs.	**Green** Plan provides sponsor-paid joint and survivor benefits to spouse upon death (pre-and post-retirement). Companion welfare plan that is directly linked to the retirement plan provides for children's benefits.	**Green** Moral hazard not significant.
Requirement for individual skills	Level of knowledge required to plan for retirement.	**Green** Only requires understanding of various benefits offered (not required to convert single sum to annuity stream, or know the level of single sum required).	**Green** Moral hazard not significant (lump sums are not available).
Investment risk	Protects against fluctuations in market returns.	**Green** Risk borne by plan sponsors.	**Yellow-Green** Institutional investing on behalf of all plan sponsors limits the risk that the plan will be terminated when less than fully funded. Paternal structure should ensure that investment losses are covered.

Appendix V
United Methodist Church (UMC) Plan - Individuals

Individual's Needs & Risks (Composite rating: Green ■)			
Criteria	**Description**	**Evaluation**	**Effect of moral hazard**
Longevity risk	Protects against possibility to outlive assets.	**Green** Efficiently hedged or pooled depending on arrangement.	**Green** Moral hazard not significant (lump sums are not available).
Inflation risk	Includes both pre and post retirement inflation.	**Green** Final pay plan offers pre-retirement inflation protection, and automatic 2% annual post-retirement benefit increases are provided. Participants may choose to upgrade to a higher fixed annual increase.	**Green** Moral hazard not significant.
Premature retirement risk	Protects against forced early retirement due to disability, family circumstances, and involuntary termination.	**Yellow-Green** Disabled participants continue to accrue benefits as though they are active. Involuntary termination is extremely rare as clergy are afforded guaranteed employment. There is no protection against forced early retirement due to family circumstances.	**Yellow-Green** Moral hazard not significant.

Appendix V
United Methodist Church (UMC) Plan - Employers

Employer Needs & Risks (Composite Rating: Yellow-Green)			
Criteria	**Description**	**Evaluation**	**Effect of moral hazard**
Supports primary business purpose	Enhances core purpose of the employer's business.	**Green** Neither congregations nor regional conferences must know how to design, administer and fund a plan (although regional conferences must allocate cost of plan back to congregations). Plan custom designed to meet needs of clergy and ability of conference to deploy clergy as needed.	**Yellow-Green** Regional conferences' administrative offices may not be effective budget managers.
Workforce management: attraction & retention	Enhances business value by allowing attraction and retention of the "right employees".	**Green** Allows regional conferences to deploy clergy as needed. Plan design reinforces church's notion of what is fair and equitable retirement, reflecting that notion to clergy.	**Green** Moral hazard not significant.
Workforce management: transition of employees	Enhances business value by facilitating the orderly transition of employees.	**Yellow-Green** Can provide incentives for employees to stay or retire on a voluntary basis.	**Yellow** As clergy population demographics shift, church structures that intentionally put a drag on change limit the ability to shift accordingly.
Supports new norms for work and retirement	As needed, supports shifting norms for work and retirement, e.g. phased retirement, return to work, etc.	**Red-Yellow** Some informal ability for the plan to use "retired" in part-time and low-paying roles (while individuals draw pension).	**Red-Yellow** Moral hazard not significant.

Appendix V
United Methodist Church (UMC) Plan - Employers

Employer Needs & Risks (Composite Rating: Yellow-Green)			
Criteria	**Description**	**Evaluation**	**Effect of moral hazard**
Responsive to owners	Responds to needs of owners, e.g., shareholders for public companies, which may limit amount of risk to be taken.	**Yellow** Board has historically acted responsibly to ensure strong funding levels, but this is more due to individuals on Board rather than sound governance structure.	**Yellow** Moral hazard not significant.
Business risk	Ability to react quickly to changes in the competitive landscape.	**Yellow** While plan design can be changed, retroactively, can only occur every 4 years and takes great will. Individual conferences have some ability to shelter congregations which are in particular need.	**Red-Yellow** Political pressure from plan sponsors can limit the ability of plan administration agency from hedging cost volatility.
Regulatory risk	Allows plan to be operated to fit needs and change to meet conditions easily within regulatory framework.	**Yellow-Green** Regulatory oversight is very limited, enabling changes to meet the chuch's needs.	**Yellow** Church decision-making systems can delay implementation of key decisions.
Fiduciary risk	Allows plan to be easily operated to minimize fiduciary liability.	**Green** Regional conferences and congregations shielded from fiduciary risk, as fiduciary responsibility held primarily by Board.	**Green** Moral hazard not significant.

Appendix V
United Methodist Church (UMC) Plan - Employers

Employer Needs & Risks (Composite Rating: Yellow-Green)			
Criteria	**Description**	**Evaluation**	**Effect of moral hazard**
Litigation risk	Allows management of workforce to avoid lawsuits.	**Yellow** Lawsuits can lead to reputation risk. Long-term nature of promise and length of liability period significantly increase litigation risk.	**Red-Yellow** Significant potential for employees to misunderstand the permanence of the benefit formula; semi-significant potential for plan sponsors to misunderstand funding responsibilities.

Appendix V
United Methodist Church (UMC) Plan - Markets

Markets Needs & Risks (Composite Rating: Yellow-Green) (include both financial markets and intermediaries (e.g. insurers))				
Criteria	**Description**	**Rating**	**Evaluation**	**Effect of moral hazard**
Maximizes use of markets	Effectively uses markets and hedging mechanisms; stakeholders can purchase hedging instruments cost effectively.	**Yellow-Green**	**Yellow-Green** Economic hedges are available but demographic hedges not widely available.	**Yellow** While hedges are widely available, they are not widely used or understood and there may be political pressure to not use hedges if its seen to drive up cost significantly.
Transparent (cost)	Costs of plan are transparent (fees, costs to sponsors, other stakeholders, etc).	**Green**	**Green** Costs can be transparent.	**Green** Moral hazard not significant..
Strong Governance	Fiduciary roles of plan sponsors well defined. Plan structure minimizes agency issues, particularly regarding plan investment and risk taking.	**Green**	**Green** Central Board controlling most decisions means governance regarding benefits, investments, and security to participants and plan sponsors is strong.	**Yellow-Green** Governance, while generally strong, can be subject to certain political risks and pressures.
Efficiently priced	Market price is well understood and accepted by stakeholders. Plan does not contain features which cannot be efficiently priced. Plans incorporate discipline in pricing.	**Yellow**	**Yellow** Traditional benefit features (e.g. early retirement subsidies) aren't efficiently priced. However plans can be designed without inefficient market features.	**Red-Yellow** Plan costs are fairly subject to the addition of benefit features that aren't efficiently priced via emotional arguments.

Appendix V
United Methodist Church (UMC) Plan - Markets

Markets Needs & Risks (Composite Rating: Yellow-Green) (include both financial markets and intermediaries (e.g. insurers))				
Criteria	**Description**	**Rating**	**Evaluation**	**Effect of moral hazard**
Efficient risk bearing	Plan efficiently pools idiosyncratic risks and hedges systematic risks (both economic and demographic).	**Yellow-Green**	**Yellow-Green** Plan efficiently pools individuals' longevity and other retirement risks. Plan can effectively hedge investment risks although instruments aren't there for systematic longevity risks.	**Red-Yellow** Managers tend to not choose risk hedging instruments. Managers may be tempted to choose risky investments to meet inflation promise.
Allocation of risk	Plan efficiently allocates risk across stakeholders, giving each stakeholder the risk he can best bear.	**Red-Yellow**	**Red-Yellow** Plan spread risks from congregations and individual conferences across the entire church. Plan holds all risks but is at liberty to make design changes which could allocate risks back to congregations.	**Red** Given culture, plan unlikely to share any risks with clergy.