Pension Reform

Both Defined-Benefit pension systems (D-B), in which the participants have no uncertainty over their pensions, as well as Defined-Contribution system (D-C), in which the participants bear all the risk, are worldwide under enormous pressure. There is already an enormous literature available about this issue. See for example the Financial Analyst Journal (FAJ) of January / February 2007, which is completely devoted to the "*pension time bomb*", "*what went wrong*", and to many approaches for "*curing the sick D-B system*"[1]

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Of course, at first sight, D-B is the best pension system from the point of view of the employees. Even references from the US support this view. See Barton Warring and Laurance Siegel, "*The most valuable and well conceived employee benefit program ever devised – the final pay D-B plan. If these plans really do disappear, that would be a tragedy for employees*", and Lynn Dudley of the Retirement Policy American Benefits Council (2006): "We know D-B pension plans are good for workers". On the other hand, D-C, ostensibly relieving employers from all pension risk, seems at first sight best from the employers' point of view. Nevertheless both systems are under enormous pressure.

Frequently mentioned reasons for "D-B plans have to go" are the fall of the equity markets, D-B systems becoming too costly due to aging and longevity, the severe approach of pension accountants and pension regulators, and "*dramatic pension deficits*". The first contribution of this paper is to argue that these are not the valid reasons for the "sickness" of D-B, but that these plans due to maturity have become unable to cope with all the risk. Risk, rather than cost being the issue, D-B plans are not fully fit for purpose anymore, and need an overhaul. Usually the "cure" was to replace D-B by D-C, in which the risks are completely transferred to the individual participants. However, due to many reasons, an estimated shortfall of 5 percent per year on the pension investments by individual D-C investors (see John C. Bogle, "*The Mutual Fund Industry 60 Years Later*", Financial Analysts Journal Jan/Feb 2005), makes the pension problems in particular dramatically worse. Therefore, with the insight that both pure D-B and pure D-C are unsustainable, new initiatives, especially Collective D-C (C-D-C), are worldwide received with great enthusiasm.

The second objective of this paper is to describe the pros and cons of C-D-C, important characteristics being no retrospective contributions, mandatory participation and well-managed low-cost pension investment, thereby relieving important shortcomings of pure D-B and pure D-C. However, we will argue that also C-D-C is not the Holy Grail for current and future pension problems. In particular, completely killing D-B "*also represents a loss to employers of one of their most valuable compensation and negotiation tools*" (Warton Baring and Laurance Siegel), which is of course especially relevant in the aging Western societies where workers get more scarce. Rather, we will advocate (our third objective) that the best pension system cleverly uses all the goodies of D-B and C-D-C, and continuously adapts to the specifics of industries, and breathes jointly with the dynamics of the economy and culture of societies that it serves.

Why is D-B not fully fit for purpose anymore?

Longevity and aging?

Frequently longevity and aging are put forward as main reasons for pension reform, and for the unsustainability of D-B. We know that it is extremely costly if the ratio of the time periods that people work and retire worsens. For example, a rule of thumb is that if people retire one year earlier, then the pension cost over their whole working period increases about 10% (and vice

[1] See especially the contributions of Keith Ambachtsheer "Why We Need a Pension Revolution", Don Ezra, "Defined-Benefit and Defined-Contribution Plans of the Future, and M. Barton Waring and Laurance B. Siegel, "Don't Kill the Golden Goose! Saving Pension Plans."

versa!). Nevertheless, longevity in our opinion should be approached by the simple and reasonable principle that the ratio of the periods of working and retiring remains constant, say one year of retiring for each two years of working (cf also Lans Bovenberg, Het Financieele Dagblad, 2007). Then, unless one would call the flexible adaptation of pension age to life expectancy a pension reform, longevity is not the main reason of the sickness of D-B.

Pension accounting and pension regulation?

Also the new pension accounting rules and the new pension laws are frequently mentioned as the evildoing key drivers for pension reform of D-B. It would of course be extremely weird if this were really to be true. Indeed the new accounting and regulating rules contain "some points to be improved". In particular, IFRS (International Financial Reporting Standards) states that if a pension system is not completely D-C, then the accountants handle it as D-B.[2] Especially for The Netherlands this is fundamentally wrongful, since almost all Dutch pension funds have an official agreement with their sponsoring companies that these will contribute additional payments to the fund if the funded ratio weakens, but, very importantly, in a precisely limited extent. (This also means, of course, that we do not have pure D-B systems in The Netherlands after all). IFRS does not respect these formal risk sharing agreements between pension funds and their sponsoring companies, and interprets these schemes as full D-B, which indeed creates an enormous pressure to change the pension systems to D-C. The right approach would be to value these risk sharing agreements between the pension funds and the sponsors as options. The pension funds have a call option on their sponsor at low levels of the funded ratios, and the sponsors have a call option on their pension funds at high funded ratios, and since Black and Scholes we know how to price these options. To verify how this is carried out to price the embedded options in pension contracts we refer especially to the Recent Ph.D. thesis "Curious Contracts" of Theo Kocken (Free University Amsterdam, 2007). The fact that accountants in 2007 not yet know about option pricing theory, thereby really forcing funds to D-C, is no real reason for reform of D-B, but a good reason for accountancy reform.

Funded status?

A next frequently heard argument is that pension funds are seriously under funded. In order to explain this criticism we first explain the concepts of the nominal funded ratio and the real funded ratio of pension funds. If the nominal funded ratio of a pension fund equals 100%, then the value of the pension assets is equal to the fair value of the nominal liabilities.[3] Thus, in this situation the fund has sufficient assets to guarantee lifelong payments of the accrued nominal pension rights, but zero capital to adapt the pension rights for the future increases in the cost of living (referred to as indexation, or as COLA, the abbreviation of Cost Of Living Allowance). Then, for the sake of argument assuming that inflation in the next 40 years would be equal to the average inflation of 4% over the previous 40 years, the real value of non-indexed pensions would drop 80% (i.e. the real value being 20% of the initial pension saving). Therefore "*a nominal pension is no pension*". The COLA issue is fully solved if the real funded ratio equals 100%. Then the fund possesses sufficient assets to guarantee lifelong COLA on the currently accrued pension rights. In The Netherlands the average nominal funded ratio equals about 130%, implying that the average real funded ratio is approximately 100%. In the virtual situation that the funds could and would change their strategic asset allocation completely to index linked bonds, the more than 700 billion Euros of pension assets are sufficient to guarantee lifelong COLA on the currently accrued pension rights. Thus, in The Netherlands under funding is not the issue either! However, the situation in e.g. the US seems different. In September 2005 the under funding of the corporate and public pension plans was about 1150 billion US$. That amounts to a deficit of about 10% of the liabilities. The equity markets have significantly appreciated in the meanwhile, so that these deficits in a large extent will have evaporated, but suppose for the sake of argument that the equity markets would not have appreciated, and the deficit of 10% would still be there. Then the question would be if this would be a valid argument that D-B is not sustainable. We think not. The main reason for this view is that the applied definition of the deficit does not take the expected return of the Strategic Asset Allocations of the pension funds into account. Suppose that the SAA's would yield an additional return over the real interest rates of 2% per year. Then, assuming a duration of the liabilities of 20, in expectation the pension funds in the US even in September 2005 did not have a deficit of 10%, but a surplus of 30%. Even a further fall of the markets could have been coped with from this point of view. Thus, from the point of view of long term expectations the funded status is not the main reason to reform D-B either. Nevertheless this

[2] The union of Dutch industry pension funds envisages this weird principle of IFRS as "My Dalmatian is black", where a Dalmatian is a white dog with a lonely black spot.

[3] In determining the fair value of the liabilities a pension payment which is due in, say, 20 years, is discounted with the 20 year interest rate, rather than by a fixed discount rate which has been the actuarial approach over the last decades.

analysis brings us to the main weak point of D-B, which is whether these risks that unavoidably accompany these Strategic Asset Allocations can in the meanwhile be absorbed, or prevent the pension funds from ever arriving in the long term. The disappointing answer to this question is given in the next paragraph.

Maturity and solidarity
The main reasons for adaptations of the current D-B systems are the maturity of pension funds, and the apparent declining solidarity in the Western societies. Maturity means that the relative share of the pensioners in the total pension liabilities increases over the life cycle of a D-B system, and that the ratio of the total pension liabilities and the salaries of the employees in the D-B system decreases over time. E.g. for a representative D-B scheme that started 10, or 25 or 60 years ago, 10% of the pension liabilities is equal to approximately 10%, 25% and 40% of the salaries. This means that if the fund, due to the risk in the SAA would be confronted with a 10% deficit, this would require 10%, 25% and 40% of the salaries if the fund would be 10, 25 or 60 years of age respectively. In The Netherlands anno 2007 an average deficit of 10% in all the D-B schemes would require about 25% of national salaries, increasing to about 40% if such a deficit would occur when the maturity is at its maximum in 2035. IFRS and the new pension laws are not the cause of this problem, but make them visible (although partly excessively visible). This phenomenon is not typically Dutch, but will happen in the life cycle of every D-B plan (and could thus have been foreseen). Funding these deficits out of the margin for wage pay would mean that in a very large extent younger people would pay for the pension deficits of older people, and we clearly see less propensity in society to do so. Secondly, in the life cycle of a D-B system, the leverage of pension assets to the margin of wage pay becomes so large that even if solidarity would not be under pressure, immediately making up pension deficits out of the margin of wage pay simply becomes economically impossible. Therefore we need D-B reform, the issue not being expected cost, nor deficits, nor aging, nor longevity, nor IFRS, but risk.[4]

Pure D-C?

The arguments and developments in Section 2 (frequently the wrong ones), have worldwide led to a strong move from D-B to D-C, especially in the US, and more recently in The Netherlands. Moving to a pure D-C system would of course solve the main shortcoming of D-B, since the contribution in D-C is fixed with an ostensible zero risk for the employer and for the margin of wage pay. In D-C sponsors bear no risk, rather that all the risk in pure D-B. However, pure D-C, in which the participants bear all the risk, has extreme shortcomings. We describe the most important ones.

Strategic Asset Allocation
Experiences in the US show that individuals make very poor investment decisions, and make too many costly transactions, and can not profit from economies of scale. Also, D-C investors in the US frequently invest a large extent of their pension assets in their own firm, as was painfully shown by the ENRON case, which of course is irresponsibly inefficient from the point of view of diversification. A very informative reference about these issues is "*Coming up Short, The Challenge of 401(k) Plans*" by Munnell and Sunden (2005). Very important research on this topic is also done by John C Bogle, "*The Relentless Rules of Humble Arithmetic*", Financial Analyst Journal November/December 2005. This paper shows that whereas the S&P index performed 12.8% per year over the period 1983-2003, mutual funds scored 10.0%, and individual investors only made 6.3% per year. In "*The Mutual Fund Industry 60 Years Later: For Better or Worse*" in the Financial Analyst Journal January/February 2005 John Bogle estimates that individuals make 5 percentage points less return per year than well-managed low-cost pension funds. Realizing the rule of thumb that 1 percent point less return over the whole life cycle is equivalent to 25% lower pensions, the performance results of individual D-C investors are dramatic, leading to severe pension crises.

Non mandatory pension saving
Especially in US version of D-C, people are rather free in the extent that they save for pensions. Since the spectacular rise of the behavioral finance we better understand why people in practice don't behave like the homus economics in the economic textbooks. As a result in North America less than 50% of the workforce is covered by pension plans. As a dramatic result of insufficient pension saving and inefficient unprofessional pension investing the Employee Benefit Research Institute reports that the median of D-C plans at retirement equals $44.000, which converts to a very meager pension annuity of $3600 per year.

Longevity risk of unannuitized D-C plans
M. Barton Waring and Laurance Siegel in "*Don't Kill the Golden Goose*" analyze the situation in the US where D-C pensions apparently aren't annuitized frequently. They quantity that "*buying a D-B annuity*" would lead to about 35%

[4] See also Guus Boender, "Modernisering van ons Geroemde Pensioenstelsel: Niet Onnodig Duurder of Schraler, Maar Weerbaarder", in Dolf van den Brink en Frank Heemskerk, "De Vergrijzing Leeft", Bert Bakker.

lower pension cost. Note that this is an opportunity cost in excess to the previous cost of voluntarily and unprofessional pension investing.

Solidarity and time diversification
Finally, Aerdt Houben of the Dutch Central Bank (Pensioen Bestuur en Management, 2006) quantifies that individuals who would have started pension saving in 1952 would 40 years later at retirement have an approximately 100% lower pension capital than individuals that would have started pension saving in 1959. In a D-B like pension system participants are much less vulnerable for this timing risk of retirement.

Thus, remedying D-B by moving to pure D-C, would lead to insufficient savings, disastrous portfolio performances, possibly unnecessary longevity risks, and unnecessary timing risk of retirement. Thus, although pure D-C solves the weakest point of D-B, moving to pure D-C would not solve our pension problems, but rather immensely worsen the pension problem, leading to extremely low pensions at extremely high costs.

Collective D-C

Since pure D-B is not sustainable when the plan gets older, and since pure D-C has too many severe shortcomings as well, people worldwide are searching for the optimal pension system. From this point of view it is understandable that the new initiative called Collective D-C is welcomed with great enthusiasm.[5]

What is C-D-C? First of all, in C-D-C the contribution is fixed. A fixed contribution is not to be understood as e.g. a fixed percentage of salaries, because it is allowed to be a "fair value" contribution that varies with changing interest rates, or with changing assumptions about future expected portfolio returns. However, the contribution is not allowed to contain retroactive components, thereby completely remedying the weak point of D-B, and solving the Balance Sheet and Profit and Loss account of the sponsoring companies from pension fund risk. The Collective part of C-D-C refers to the agreement that pension saving and pension investing is carried out collectively, which relieves the most important shortcomings of voluntary individual D-C. From this point of view C-D-C is without any doubt for many situations superior to both pure D-B, and to voluntary individual D-C.

C-D-C, annulling important shortcoming of D-B and D-C, now in practice is frequently propagated as the Holy Grail for all current and future pension issues. Unfortunately that is not the case.

Cost of C-D-C
In transforming from a D-B system to a D-C system, which in 2007 is always at the request of the employers, employees reasonably ask a fair price for the risk that is put on their pension shoulders. In practice, even in the Dutch cases where pension risk of the sponsor is significantly restricted, the price of this option frequently equals 30% of the actuarial cost of the D-B system, and 50% of the expected cost.[6] Thus, C-D-C in expectation is frequently 50% more expensive than D-B. In practice this is referred to as the C-D-C dowry that the employers have to pay in order to get risk of pension risk. First of all companies have to determine if this is an efficient (risk adjusted) allocation of capital. Secondly, if contributions are in expectation 50% higher than in D-B, then expected pensions must become 50% higher as well. This is a pleasant outlook for future pensioners, but must nevertheless be characterized as an important inefficiency of C-D-C.

Risk sharing of companies and pension funds
Due to the maturity of pension funds, the contribution has weakened as the instrument to solve possible deficits. At the moment that pension funds achieve their maximum maturity, immediate solving of a pension deficit of 10% would require 40% of salaries. This is the main weak point of pure D-B, and the reason that the contribution by many experts has been declared "dead" and "blunt" as an adequate policy instrument for pension management. The first conclusion is true, but the second one, which is seemingly equivalent to the first one, is not. To see this, we refer to the dowry of 30% to 50% mentioned above. This is a high price for a policy instrument that has been declared to be "dead". As a second argument one should realize that the contribution for the employees (thus excluding contribution increases to remedy possible deficits of pensioners) is a policy instrument, just as strong as it always has been.

Pensions as compensation tool for employees
As remarked before, Warton Bearing and Laurance Siegel in their paper referred to above state that killing D-B "*also represents a loss to employers of one of their most valuable compensation and negotiation tools*". Of course, in aging societies where workers get very scarce employers that "*have put the pension fund outside*" lack a very important policy instrument to attract and retain a strong workforce. An interesting example to illustrate the attractiveness

[5] Actually C-D-C is not new at all, since e.g. in The Netherlands the pension funds of the medical doctors and of the medical specialists already for decades work with a pension system that today is called C-D-C.
[6] The expected cost is frequently significantly being lower due to portfolio return exceeding the actuarial assumptions.

of good pension conditions for employees concerns the pension scheme of scarce top talent in the Board of Directors of many companies. Notwithstanding the strong move to C-D-C, the pension system of many Boards of Directors is still final pay D-B.

Hybrid D-B, C-D-C

We made clear that companies can't take full responsibility any more to immediately remedy possible pension deficits of their active and retired workers. Therefore D-C components, in the sense that the companies do not bear all the pension risk are unavoidable and implementing the required D-C component as C-D-C is superior to individual D-C.

However we stress that removing all the risk to the participants, realizing a full C-D-C, could be inefficient, both from the point of view of the company and from the point of view of the participants. The company pays a high "dowry" price to get rid of pension risk and for the participants even a fair dowry in bad occasions might not suffice. Compare this with an insurance company getting fair premiums for e.g. the risks of storms, but that actual storm risk might be significantly higher. Therefore we strongly plead for hybrid D-B / C-D-C systems, where the companies keep participating in the pension scheme, but restricted to the extent that they are able and willing to bear pension risk. The power of such a hybrid scheme over both D-B and C-D-C is verified by a forthcoming recent master thesis of Chantal de Groot "*An analysis of individual and collective pension systems*", Tilburg, 2007. For the employers such a hybrid scheme implies lower expected pension cost, and more control over pension as a compensation tool than in a complete C-D-C system, whereas pension risk is explicitly constrained. For the employees these hybrid schemes imply that expected pensions are more in accordance with the pension objectives and worse outcomes that are significantly less painful than in a complete C-D-C.