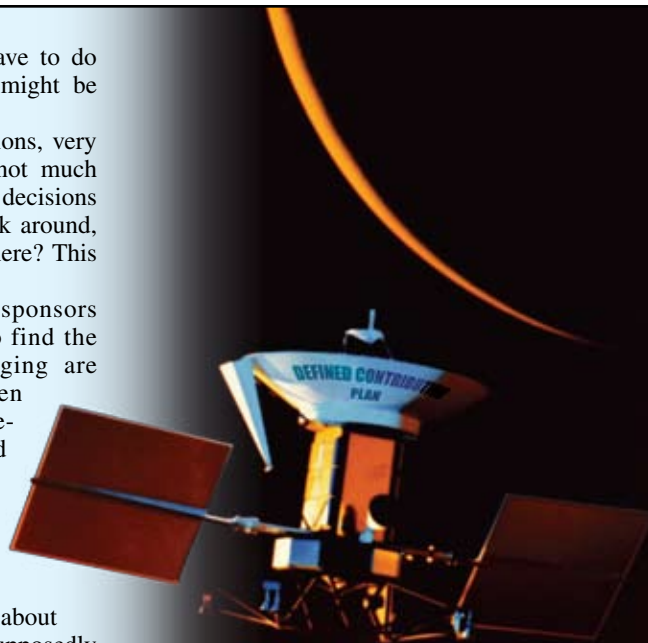


**W**hat does rocket science have to do with pension plans? You might be surprised!

When it comes to pensions, very little happens overnight. The truth is, not much happens in a year. But we all make small decisions every day and one day we wake up, look around, and say to ourselves, 'How did we get here? This isn't where I thought we were headed!'

That feeling may be familiar to sponsors of Defined Benefit pension plans who find the plans they thought they were managing are managing them. You might ask 'when did a contractual promise of a retirement income shift to a trust-based commitment to provide income plus the ownership of assets?' It certainly didn't happen overnight.

'DB refugees' who now sponsor Capital Accumulation Plans may have the queasy feeling that this experience is about to repeat itself as they discover their supposedly 'risk-free' CAPs offer no end of operational risks. When did that happen? When did sponsors lose control of their promises?



## Rocket Science And Pension Plans

### Less Troublesome Future

A quick look at a bit of rocket science might help us pinpoint some answers and point the way to a less troublesome future for group retirement plans – whatever their design.

Whenever a spacecraft is launched, it is understood that course corrections will need to be made to fine-tune the trajectory. Rocket scientists have their own jargon and refer to these as Trajectory Correction Maneuvres (TCMs). During many months or years of travel over hundreds of millions of miles of space, the spacecraft's path will need to be adjusted slightly – possibly several times – to make sure it arrives at its planned destination.

A good example is a robot spacecraft called Phoenix, launched last summer to land on Mars in 2008.

Like any interplanetary spacecraft, Phoenix's course was mostly set once the launch vehicle fell away. From that point on, the spacecraft is 'falling' through space and can make only very small corrections in its trajectory by firing its small engines or thrusters. To make these TCMs, the rocket scientists must measure, with a high degree of precision, the exact location of Phoenix and compare it with where the mission's flight plan says the spacecraft should be.

As you would expect, to correct any discrepancy, scientists must compute the direction and magnitude of the vector required to correct to the desired trajectory. An opportune time for making the TCM must be determined. Sooner is better than later. A smaller magnitude of change would be required, for example, immediately following a planetary flyby than would be required after the spacecraft had flown an undesirable trajectory for many weeks or months.

### Firing The Thrusters

Last August, Phoenix's first TCM was performed. It involved firing the thrusters for a little over three minutes. Before the TCM, Phoenix was traveling (relative to the sun) at 74,400 miles per hour (that's fast). After the TCM, it was going 41 miles per hour faster (that's not much of a change). Consider how slow that acceleration is. A family minivan can go from zero to 60 in less than 10 seconds. However, adding just 41 miles per hour to 74,400 miles per hour illustrates how a small adjustment playing out over vast distances can make a big difference. Scientists estimate that without the TCM, Phoenix would have missed Mars by 590,000 miles!

This analogy applies easily to the financial side of retirement planning. After all, just as rocket scientists work out their TCMs, actuaries continuously update the funding parameters of the pension plan to correct for the effect of changing economic factors such as interest rates, salaries, capital market returns, and other business factors. You could say that valuing a pension plan involves a succession of mid-course corrections.

But, there's a deeper lesson to uncover, involving the subtle effect of less obvious forces at work. Getting where we want to go requires that we correct for minor factors that have a major impact over time.

For rocket scientists, determining the path of a spacecraft is an incredibly complicated calculation that has to take into account the changing gravitational effect of the bodies that tug on the spacecraft – even the effect of asteroids needs to be factored in. We might imagine that inertia keeps everything in space going in a straight line, but gravitational



## PENSIONS

**By: Christopher Cartwright**

effects in the solar system make for a trajectory that is anything but a straight line.

In the same way, the promises written into pension plan texts are subject to the constant pull of outside forces – such as social changes, legal precedents, and accelerating plan member expectations. We've seen this with the trajectory of DB plans over the last 30 years or so.

Did those employers who established DB pension plans for their employees many years ago ever imagine where those plans would end up today? Promises and engagements can always be misconstrued, but the real problem only arises when the errors are not challenged promptly. The shift happens very gradually, day by day and year by year, as the nature of the original intent becomes confused and a new sense of entitlement takes hold. In the case of DBs, the promise at the heart of the pension plan was eclipsed by the instrument used to guarantee it.

### Pension Security Trust

A refreshingly compelling and lucid vision of how the DB model can be set back on course was presented to the Ontario Expert Commission on Pensions by the Canadian Institute of Actuaries (CIA). The CIA proposed the use of a Pension Security Trust that would be separate from, but complementary to, regular Defined Benefit pension plan funds. As its name implies, it would be used to help guarantee the benefits promised in the pension plan. Plan sponsors could use the trust to increase funding levels and enhance benefit security for plan members, but if contributions were subsequently found not to be needed to fund benefits, they could be released back to the plan sponsor. Although the CIA's proposal does not push the concept quite so far, it could be argued that the entire DB pension fund should be considered a 'pension security trust' – at least, for the contributions made by the plan sponsor and the earnings thereon.

In any case, by defining a new model for pension funding, the CIA is proposing a course correction that could re-focus future legal battles over surplus pension assets and help put DB plans back on their original path. These course corrections can be as needed – and as useful – for CAPs as well.

For example, by design, a Defined Contribution pension plan or Group RRSP does not promise a specific benefit at retirement. Instead, it allows employers to assist their employees to set aside a little money every payday and have it accumulate for when they stop working. In such a scenario, the sponsor fulfills its commitment every pay period when the defined amounts are placed in the designated accounts for future use by the members. However, recent talk of 'replacement ratios' and 'adequacy' of benefits has begun to exert a pull on the limited engagement of simply setting money aside for retirement.

It seems that some people consider a DC pension plan, or even a Group RRSP, as inherently promising a retirement income. They interpret the words 'pension' or 'retirement' to signify an engagement to provide 'an adequate lifetime income.' If you sponsor such a plan and it is, indeed, your intention to provide a certain level of income, then you rightfully should worry about the 'adequacy' of contributions, the level of investment earnings, and the length of holding periods.

On the other hand, if the intention of your DC pension plan or Group RRSP was based on the more traditional meaning of the words 'retirement savings,' take note: you may be hurtling towards a vastly different destination. You should implement, as soon as possible, your own course correction. If you don't act before it's too late, your pension board members may find themselves in a place they never intended to be ... being called to account for the (in)adequacy of the benefits. Like a misguided spacecraft,

without small course corrections early on to set it back on target, the misunderstood pension plan will drift towards a destination far different from the original plan.

### Nudge Any Plan

And therein lies the problem. Acting over time, the 'gravitational tug' of uncorrected expectations – the oh-so-Canadian concept of entitlements – can nudge any plan way off course.

What have we learned from the rocket scientists? We can sum it up without jargon:

- ◆ Whether you know it or not, you are always in motion: don't let your path be left to the chance effects of forces outside of your control.
- ◆ Know where you are trying to get to before you start.
- ◆ Carefully point yourself in the right direction.
- ◆ The launch is important, but will not, by itself, guarantee you get where you want to go.
- ◆ Even minute forces can have a significant influence if they act over a long period of time.
- ◆ Always keep track of where you are.
- ◆ Always keep in sight where you are going.
- ◆ Be prepared to make multiple adjustments.
- ◆ Sooner is better than later. If you wait too long, the cost of the adjustment might be more than you can afford.

And finally, when someone asks you what you do for a living, you can smile and honestly tell them, "What I do is a little like rocket science..." ■

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