



McGill International Portfolio Challenge

2021 Edition

The Netherlands' Bouwen & Pensioen:

Rethinking Pension Investing in the Context of Low Yields

Disclosure

The case for the 2021 edition of the McGill International Portfolio Challenge was written by the students of FINE 464/690 – Pension Funds and Retirement Systems (Winter 2021), under the direction of Professor Sebastien Betermier at McGill University's Desautels Faculty of Management. Authors of the case include Yuan Chu Zi Lao (lead author), Carlos Charpenel Juárez (lead author), Agatha Allain, Adam Clark, Louise Morteveille, Etienne Pouliot, Tomas Comber, Alfonso Fernandez Pelayo, Jaiveer Gandhi, Jackie Hudspeth, Arjun Kapur, Guillermo Simonet Romero, and Bill Suri.

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Case Overview

Preface

This year's edition of the McGill International Portfolio Challenge centers on the Bouwen & Pensioen ("Bouwen"), a newly formed fictional Dutch Collective Defined Contribution (CDC) pension plan for construction workers in the Netherlands¹. The pension plan is set to come into effect in January 2022 and will manage €30 billion of assets for its roughly 300,000 members.

In the past years, a bevy of factors including the aging population, financial deficits and enduring low interest rates have strained the Dutch pension system, which has consistently been considered one of the world's best². Legislators have been engaged in discussions to redesign the existing Dutch Defined Benefit (DB) and Defined Contribution (DC) occupation plans, which has prompted many pension sponsors to review their own schemes.

The purpose of this case is to assist Max Aarden, the CIO of the newly constituted Bouwen, to devise an optimal investment strategy given the fundamental shift with Dutch pensions. On one hand, the starting fund allocation of 55% to bonds may no longer be viable given the low yield environment. On the other hand, additional risk-taking must be carefully studied as to continue meeting benefit payments while maintaining equitable risk sharing across generations. While Bouwen is fictional, real data from the Netherlands is used to frame the discussion surrounding current socio-cultural, economic, and political conditions.

The Dutch Pension System

The Netherlands economy is ranked 17th in the world, with a GDP of \$913 billion in 2020³. The country has a population of over 17 million⁴. The economy is largely based around the services industry, making up approximately 70% of GDP⁵.

The Dutch pension system relies on a combination of pay-as-you-go and individual pensions organized in 3 pillars⁶. The first is a state pension which provides basic income to all pensioners based on the number of years worked or lived in the Netherlands. The second consists of occupational sector pension schemes, mostly DB, either operated by a pension fund or an insurance company. Together, the first 2 pillars are intended to equal 75% of pre-retirement salary. The third and final pillar is comprised of individual pension products meant to supplement retirement income.

The pension system in the Netherlands has consistently been best-in-class on the annual "Global Pension Index," a benchmark published by consulting firm Mercer to measure the quality of pension systems⁷. Despite its high ranking, the Dutch pension scheme was not designed for protracted low yields, as most plans are DBs that have a significant portion of their assets in income-generating investments.

Protracted Low Yields

The problem of yields being too low isn't limited to expected investment returns being too low. It also extends to an increase in liabilities resulting from lower discount rates. As a result, pension funds may increasingly face challenges honoring the DB benefits they promised to their members. In a world where Dutch workers are already required to save 25-30% of their salaries to fund their pension⁸, simply increasing contribution rates to remedy the situation is challenging.

Consequently, a reform is underway⁹ that proposes converting all Dutch DB plans to CDC plans to readjust to the current economic situation. Pending the terms of the reform, all Dutch pension plans have been asked to provide their redesigned vision of long-term investing in a low-yield future.

CDC Plans

A Collective Defined Contribution (CDC) is a new type of occupational retirement plan¹⁰ that is being adopted in the Netherlands as well as a few countries such as the UK, Germany, Japan, and parts of Canada. It was introduced as a more flexible alternative, in many ways a hybrid of a traditional DB and a pure DC that allows for further intergenerational sharing while remaining professionally managed. In a CDC, members effectively pool their retirement savings into the same fund and spread the investment risk across all participants.

On the flip side, contrary to a DB, benefits in a CDC are not guaranteed and may be reduced if returns on the investments are disappointing¹¹. Additionally, contributions in the pooled fund are typically still quite high, just like in the case of current Dutch DBs.

The Creation of Bouwen & Pensioen

Bouwen will be the result of the merger of 6 smaller DB funds covering active, former, and retired members of the Dutch building and construction industry. The new pension is planned to come into effect in January 2022. Participation in the merged pension scheme is extended to all employees in the construction, infrastructure, carpentry, finishing, brick, and natural stone industries.

The creation of Bouwen provides a chance to develop a sustainable pension structure better suited for the environment of low yields. To ensure that the new pension will meet the interests of all stakeholders, the following elements are being considered in its design: (1) the portfolio's asset allocation design in a low-yield environment; (2) the fair intergenerational sharing of risk; and (3) the required level of contributions.

As this merger represents an exceptional opportunity to shape the future of pensions with a blank slate and might pave the way for future consolidation in the Dutch pension landscape, every choice will be scrutinized. A taskforce composed of key stakeholders has already met several times over the past 6 months to validate all options in order to provide robust recommendations. So far, it has determined that the new Bouwen should be structured as a CDC to allow for more flexibility. As a CDC scheme, Bouwen would calculate the fixed contribution each employer organization must pay to the fund on a yearly basis to meet pension accrual targets. Although pension accrual targets are based on each employee's earned salary, the amount of the pension will not be guaranteed. Risk will be shared across all plan members in this type of collective arrangement.

Beyond the generic recommendations above, members of the Bouwen taskforce have been unable to agree on more detailed parameters about how the new fund should be structured. How should the risk be shared between current and future generations of retirees? How much of their salary should employees be required to invest into the pension plan? In what kind of assets should Bouwen invest to maximize returns in current market conditions? In addition, how can the new pension fund adapt to risks brought on by climate change and build a resilient portfolio that will ensure the protection of its assets?

Trying to build a pension scheme that will best meet the interests of all stakeholders is no small feat as it will require analyzing different trade-offs and making decisions that will have a lasting impact on generations of construction workers. So far, members of the taskforce have had varying opinions on how each lever should be pulled to resolve the trade-offs that have been raised and are unable to come to a consensus. With the January 2022 target date fast approaching, they have come to you and your team of consultants for an external point of view.

Objective of the Case

Bouwen has a duty to all of its pensioners to provide the highest pension benefits possible while mitigating risks. With pension merger negotiations underway, Max Aarden, the newly appointed CIO, has enlisted your team to help with the design of Bouwen. He is looking for a CDC strategy that would seem fair and beneficial for all members across generations and that would ensure the fund's sustainability. The proposed strategy will then need to be approved by the board consisting of pensioners, current employees, and management. To convince key stakeholders, your team will be tasked to clearly demonstrate why and how your proposed solution will benefit them. To be successful, your team of consultants will need to explain how you will address 3 important levers:

- the contribution scheme;
- the asset allocation; and
- the risk-sharing rule.

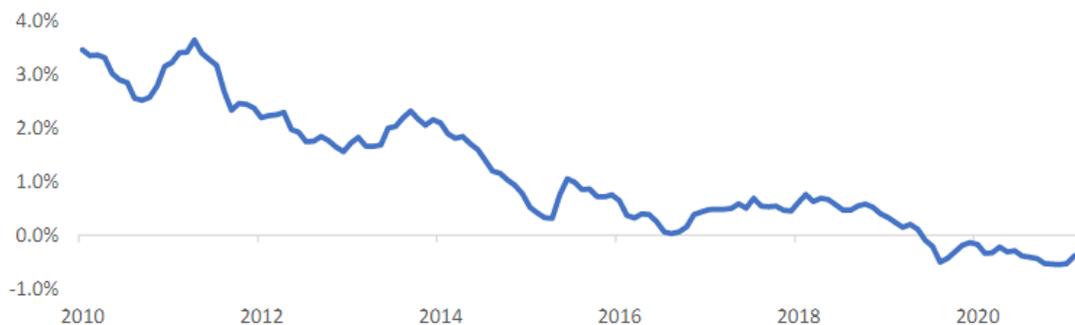
The following sections provide information that illustrates the complex nature of the new pension design. The unprecedented market conditions of ultra-low yields and high asset prices are threatening the fund's ability to maintain benefit payments for current and future retirees. Moreover, stakeholders are increasingly requiring adherence to Environmental, Social, and Governance (ESG) principles when thinking about asset allocation strategy¹². In addition, the aging population brings macroeconomic risk that disproportionately disadvantage younger workers, and they are increasingly demanding a more equitable sharing of risks and benefits. Finally, while Dutch pension funds historically required above average contributions from employees¹³, that rate should be re-assessed in the context of the new pension plan.

The Current Situation

The Problem of Low Yields

For pension funds, navigating investment opportunities today presents a difficult challenge never seen before. Bonds are generating near-zero yields, while stocks are exhibiting high valuations and volatility¹⁴. This is a universal issue that institutional investors must face, especially in European countries where interest rates have reached negative territory. The chart below shows that, in the Netherlands, bond yields have followed a decreasing trend for the last 10 years and reached -0.406% on August 31, 2021¹⁵. This issue is not limited to the Treasury market as municipal and corporate bond yields have also declined over the same period. Pension providers have to plan for the possibility of low yields persisting for another while. They therefore need to design their investment strategy to work in a world in which 10-year government bond yields could remain under 1% for the foreseeable future.

10-Year Netherlands Government Bond Yield



One headache that low yields have created for institutional investors is that they must now find different ways to maximize returns for their funds. This can ultimately cause a search for yields, enticing fund managers to move into riskier assets or equities that are currently at a near all-time high. Furthermore, these record high valuations may influence the future returns of the equity market. The historical evidence points to an inverse correlation between price to earnings (P/E) ratios and 10-year forward returns, which indicates that future returns could be sub-par in comparison with historic results¹⁶. The chart below shows that when the P/E ratio (left side) is at high levels in its historic range, the subsequent average 10-year market returns (right side, inverted axis) are relatively low or even negative¹⁷.

Shiller Cyclically Adjusted Price/Earnings Ratio vs 10-year Forward Return



Source: Robert J. Shiller of Yale University, Bloomberg, Morgan Stanley Wealth Management GIC as of March 25, 2021

The current market's P/E ratio is the highest it's been in decades. The Shiller P/E ratio referenced in the graph above, which is based on the annual earning of S&P 500 companies over the past 10 years, currently sits above 38 and exceeds the recent 20-year average by approximately 50%. If the correlation between P/E ratio and forward return is to be believed, results for the next 10 years may be disappointing: looking at the graph, the implied return might be close to 0%. Although the original Shiller ratio looked at US equities, P/E ratios today are high across asset classes and geographies. Pension fund managers must therefore find solutions to deal with the uncertainty of having low future expected returns everywhere.

Solvency in Pension Funds

Under existing pension regulations, both DBs and CDCs in the Netherlands have historically been subject to strict solvency requirements. These rules have in turn affected the investment strategy of pension funds by indirectly pushing them toward a higher allocation to bonds, a less risky class of assets¹⁸.

The calculation of solvency in a pension fund is meant to measure whether its assets are sufficient to pay the benefits owed to its members. This method of calculation assumes that the plan is about to be closed today and that its assets will be used immediately to meet existing liabilities. A solvency deficit means that there are more liabilities than assets. Put differently, the pension plan faces a deficit when the solvency ratio defined below is less than 100%.

$$\text{Solvency Ratio} = \frac{\text{Pension Plan Assets}}{\text{Pension Liabilities}}$$

Solvency rules for pension schemes are typically in place to prevent a funding deficit by requiring pension funds to be able to absorb potential financial losses. A loss can arise if the assets invested experience negative returns. For example, during the 2008 global financial crisis, negative returns had decreased the value of pension fund assets. Additionally, a loss can also arise if liabilities increase in response to a drop in interest rates. A decrease in interest rates augments the value of a pension's liability since the present value (PV) of amounts owed to current and future pensioners is discounted at a long-term bond market rate¹⁹.

$$\text{Pension Liability} = \sum \frac{\text{Future Pension Payments}}{(1 + \text{Risk-Free Bond Yield})^t}$$

Due to the low-yield environment, discount rates have been lower than 1%, pushing the value of pension commitments higher. Taken together, a decline in interest rates and poor investment returns can cause a plan's liabilities to exceed the value of its assets and lead to a solvency deficit. In that situation, a pension plan would be incapable of paying all the pension benefits owed to its members.

The existing legislation in the Netherlands prescribes that DB and CDC occupational pension funds both need to adhere to strict solvency rules. As a consequence, fund managers have historically purchased more bonds to reduce solvency deficit risk. Bonds act as a good hedge because they move in the same direction as pension liabilities given that they both have an inverse relationship to interest rates. This prioritization of a short-term focus on solvency ratios explains why most funds have so far held on average 50% in bonds²⁰. However, the focus on avoiding short-term deficits has detracted fund sponsors from the important question of the long-term sustainability of the system. In fact, in the current

environment of low yield, existing DBs and CDCs are having difficulty meeting the future needs of their pensioners without requiring high contribution rates.

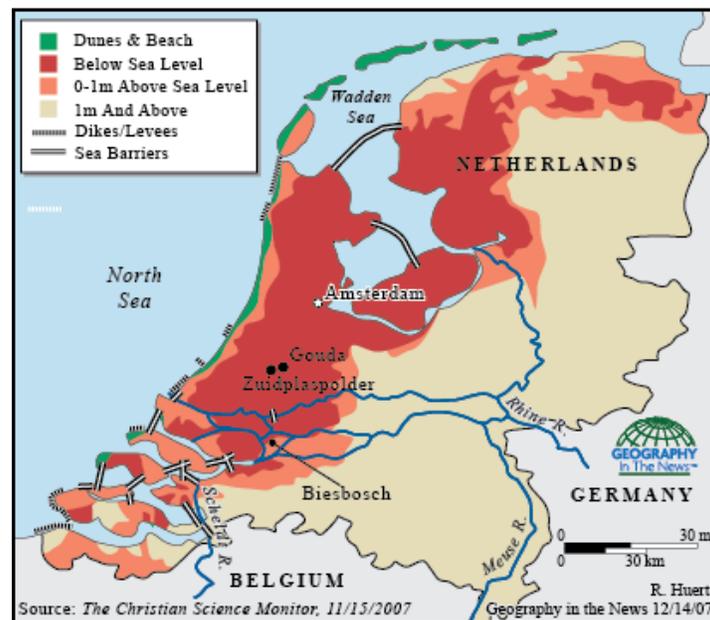
A reform in the Dutch occupational pension system and a possible move away from solvency requirements for new CDC schemes will provide the opportunity to realign priorities. If CDCs are no longer bound by solvency regulation in the future, managers will have fewer reasons to keep a large portion of the portfolio in bonds and may decide to invest in other types of assets. Moreover, as more funds decide to change their asset allocation, the resulting mass exodus from bonds might exert downward pressure on bond prices and in turn raise their yield.

The Threat of Climate Change

Beyond mitigating traditional investment risks, pension managers are increasingly considering risks linked to climate change when overseeing their funds. On the one hand, the implementation of ESG policies implies a mass re-evaluation of assets that can have a significant impact for the balance sheets and the financial stability of pension funds.

On the other hand, global warming is leading to structural changes that can increase the frequency as well as the severity of extreme weather events such as floods and wildfires. The Netherlands is particularly vulnerable as close to 55% of the country is considered flood-prone and approximately 25% of it is below sea level²¹. In fact, the Netherlands ranked 16th in terms of exposure to natural hazards according to the World Risk Report for 2020²².

Sea Level Rise Threatens the Netherlands



In the past, pensions covering the Dutch building and construction industry, including the 6 funds to be merged into Bouwen, have allocated close to 7% of their portfolios to Dutch real estate as a way to diversity assets. With the looming threat of climate change, the new Bouwen will need to assess if its inherited portfolio assets are still safe and sustainable, especially when it pertains to coastal real estate.

The 3 Main Considerations for a Sustainable CDC Model

Design elements of the new CDC scheme

Key stakeholders in the Bouwen taskforce have decided that a modified version of a CDC would be the preferred future state configuration of the pension post-merger. Just as in a DB, contribution levels from both employees and employers will be fixed (as a proportion of salary) in a CDC. Members won't need to oversee their own investment decisions since their savings will be managed collectively. Those pooled funds will be professionally invested with a "defined ambition" target and, while pension benefits will be variable, the expected returns for CDCs are on average higher than under DBs with the same contribution rate due to there being less constraints on portfolio composition. Indeed, CDCs such as Bouwen will no longer be subject to solvency rules²³ nor be required to avoid short-term deficits, thus allowing them to hold a higher proportion of return-seeking assets.

Dutch workers and pensioners care a lot about the concept of solidarity. The collective nature of CDCs makes them attractive since it can facilitate risk-sharing and transfer of resources between generations and over time. While DBs were criticized because they weren't perceived as fair, individual DCs were also disliked for their erasure of the concept of solidarity. The CDC structure provides an appreciated middle ground and will thus allow for market volatility to be smoothed out intergenerationally, meaning that pension levels will become more stable for all members. At the same time, employers will be relieved of some of their accounting burden since CDCs won't have to show up on the firms' account statement²⁴.

However, questions surrounding contribution level, risk-sharing formula, and asset allocation still need to be answered. Your team is expected to weigh different configurations for each of these considerations and propose your best design to the CIO and board.

The rest of this section is meant to offer a conceptual explanation of the 3 aforementioned considerations. In addition, the last section of the case will provide more detailed examples that illustrate the effects of different design choices.

What is the optimal total contribution level for Bouwen members?

At 30%, the current pension contribution rate in the Netherlands is among the highest according to the OECD²⁵. Most Dutch workers have been obliged to save a large proportion of their salary to meet future retirement goals because their pension plans are largely invested in risk-free assets that yield little. While this arrangement has been successful up until now, it is important to reassess whether 30% is still the optimal contribution level. For instance, if Dutch workers and pensioners are willing to take on additional risk, would it make sense to reduce contribution rates while shifting pension investments toward growth assets that can provide higher returns? Selecting the contribution rate that will maximize the risk tolerance of Bouwen members will be a critical choice.

What risk sharing formula should Bouwen employ to benefit its members more equitably?

Pension benefits are typically funded by employee and employer contributions invested in risky assets. It is thus important to design pension schemes in such a way to mitigate some of the uncertainty. In DBs, all risks (e.g., investment risk, longevity risk, inflation risk) are borne by plan providers, thus putting more pressure on them and potentially leading to plans becoming unsustainable. On the other end of the spectrum, in standard DC plans, risk is borne by individual members who have their own notional accounts and there is no risk sharing between generations.

One objective of the CDC redesign is to redefine the level of risk sharing across generations of pensioners. To do so, new CDCs will feature a “solidarity reserve” on top of members’ notional accounts that will provide return smoothing. In good times, when an active member’s notional account realizes a positive return and is funded above its target ratio, part of the surplus generated will be contributed to the shared reserve account. In bad times, when negative returns lead to some notional accounts being underfunded, members can draw from the reserve to partially cover their loss. In the CDC design proposed by Bouwen’s board, this reserve will be capped at 15% of the total pension fund’s net asset value.

For risk-sharing to be equitable between the younger generation just starting to work and the older generation close to retirement, what other rules should govern the reserve account? More specifically, how much should each member be expected to contribute to the reserve and under what conditions? Similarly, who should be allowed to draw from it, up to what amount, and in what circumstances? Many configurations of the reserve parameters exist and each decision will have an impact on the final risk sharing scheme.

What should Bouwen’s optimal fund allocation be in a low-yield environment?

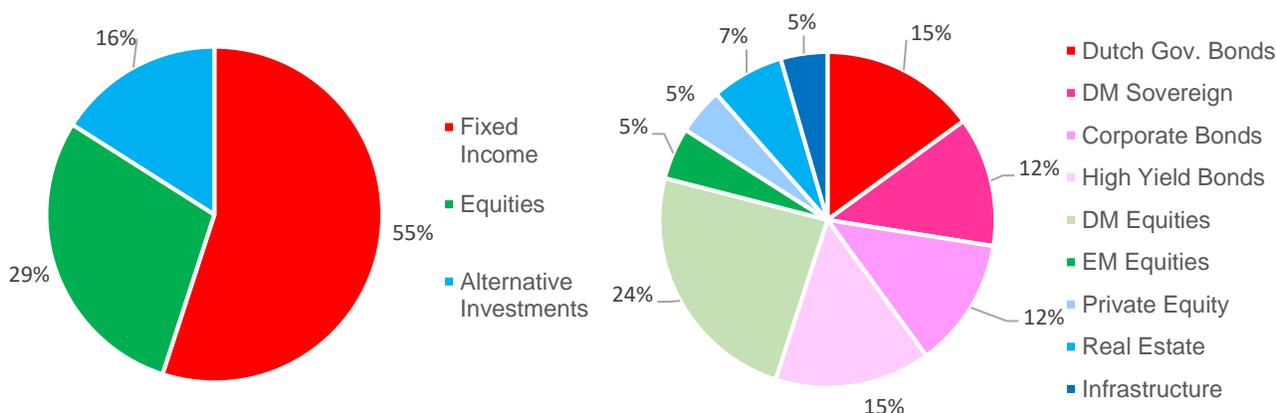
Previous solvency rules have shaped the asset allocation of the existing 6 funds that will be merged into Bouwen. Once all 6 funds will be combined, approximately 55% of the portfolio is to be invested in fixed income.

Historically, the yield at which investors have purchased fixed income instruments has been a strong predictor of future returns, explaining more than 90% of variability in forward returns over a multi-year horizon. This points to an unattractive outlook for the largest asset class in the portfolio. What should pension fund managers do with the high allocation to fixed income instruments in their portfolio in the face of very low, or even negative, yields?

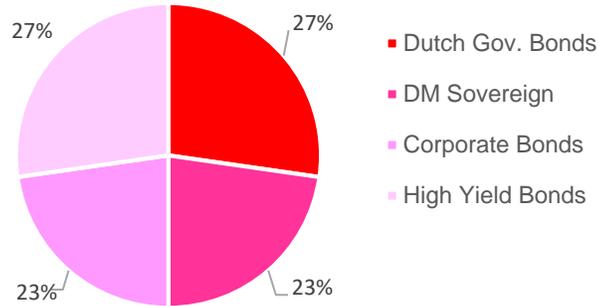
Aside from the fixed income allocation, 29% of Bouwen’s portfolio is allocated to public equities, both at home and abroad, and 16% to alternative investments. International allocation and equity investments therefore have an important place in the overall portfolio and its returns.

Over the last decade, the market has seen high returns across most equities and geographies. This in turn has allowed pension funds and investment managers to, in general, meet their objectives. However, with the current market presenting overall high prices for every asset class, it is not clear that past returns can be used to forecast expected future returns.

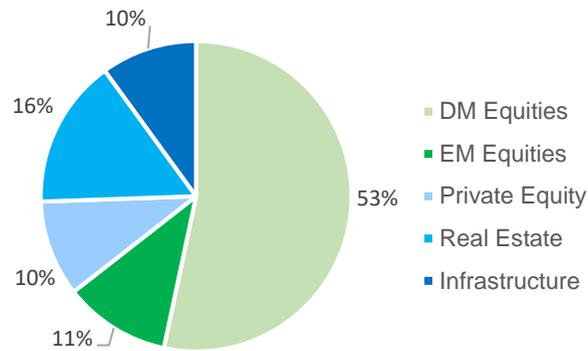
Current Asset Allocation of 6 Pension Funds to Merge



Asset Allocation Breakdown of 6 Pension Funds to Merge – Fixed Income



Asset Allocation Breakdown of 6 Pension Funds to Merge – Equities and Alternatives



Without the constraint of meeting short-term solvency requirements, what kind of assets allocation would be optimal for Bouwen under the new CDC scheme to meet its obligations to members?

Illustrations of Different Levers

As Bouwen looks to revamp its structure, the board has developed a financial model (attached to this case as an excel file) to conceptually illustrate how design choices can hypothetically affect the outcome of the pension. Namely, the model serves to show how changing the rules pertaining to each lever – asset allocation, risk-sharing, and contribution rate – can make an impact on the future benefits of a pensioner.

The financial model follows one construction worker as she starts working at age 25 and subsequently retires at age 61. During her active years, the worker contributes a predetermined amount, which is a fixed percentage of her salary, toward her pension each year. The employee's contribution is matched by her employer, and the combined amount is professionally invested through the pension fund. Upon age 61, the retired worker draws an annual pension that *aims* to cover 70% of her pre-retirement final salary. The pension benefits are however not guaranteed and will cease when the worker's notional pension account is depleted or when she deceases, whichever event happens first.

Given that portfolio returns are variable, a Monte Carlo simulation was used to visualize the range of possible outcomes. Broadly speaking, the Monte Carlo method is mathematical technique that repeatedly recalculates results for a dependent variable by randomizing the input for an independent variable. The occurrence of these possible inputs is tied to a probability distribution set by the user. For Bouwen's model, the independent variable is the portfolio's annual return, which follows a normal distribution, and the dependent variable is the pension payment the worker receives. A total of 500 different scenarios for each life-cycle path (each cycle includes a series of returns from ages 25 to 82) were produced.

The board believes that, although the model provided is relatively simple, it can still effectively showcase the mechanics of the pension fund strategy. It has also provided the following 3 comparative examples to better illustrate how changing the parameters for each lever can modify the outcome for the worker. Your team of consultants is encouraged to use the attached model and to build on it in order to propose an optimal pension scheme.

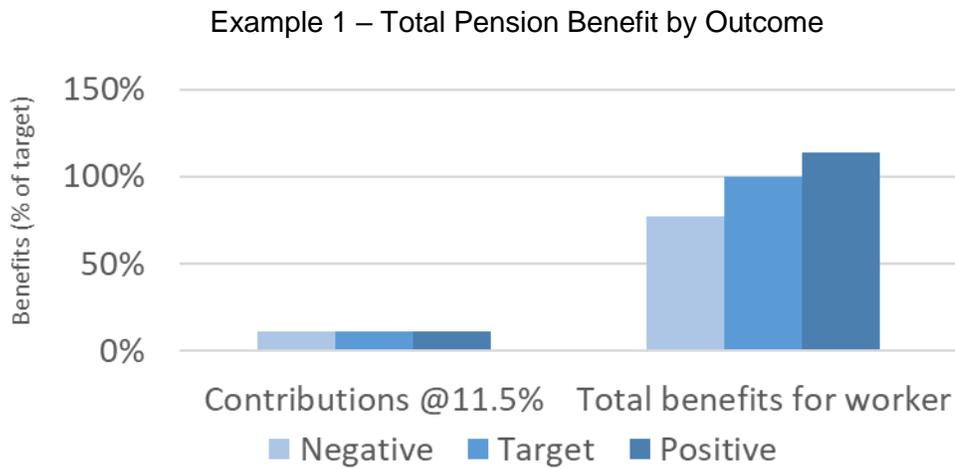
Example 1: No Risk-Sharing, Balanced Portfolio, 11.5% Contribution Rate

In the first example, the worker contributes to her own notional account and her future pension benefits depend entirely on her own investment returns. In that respect, the plan essentially functions like a traditional DC scheme as there is no risk-sharing with other workers.

The money contributed by the worker is kept invested by the fund manager in a balanced portfolio comprise of 70% equities and 30% fixed income. Example 1 assumes that the portfolio's average return is 6.5% with a standard deviation of 8%. As a result of this volatility, the worker's annual retirement benefits will fluctuate depending on market performance. The retired worker can receive higher benefit payments if her pension investments do well. On the flip side, her pension benefits could also be reduced if her portfolio underperforms.

With a balanced asset allocation, which is more heavily weighted in equities, the worker should in theory meet her pension benefit target (70% of her final salary) while keeping her contributions relatively modest. Example 1 sets the total contribution rate at 11.5% of the employee's salary and divides it equally between employee and employer. The contribution rate is not affected by market changes nor portfolio performance and remains constant throughout the worker's active years.

The chart below shows the aggregate results from a Monte Carlo simulation using the aforementioned hypotheses. The summary includes the target scenario, one representative negative scenario (first quartile), and one representative positive scenario (third quartile). The resulting chart illustrates how the worker's target total pension benefits could be reduced by over 27% when outcomes are negative (below first quartile) or increased by close to 20% when outcomes are positive (above third quartile).

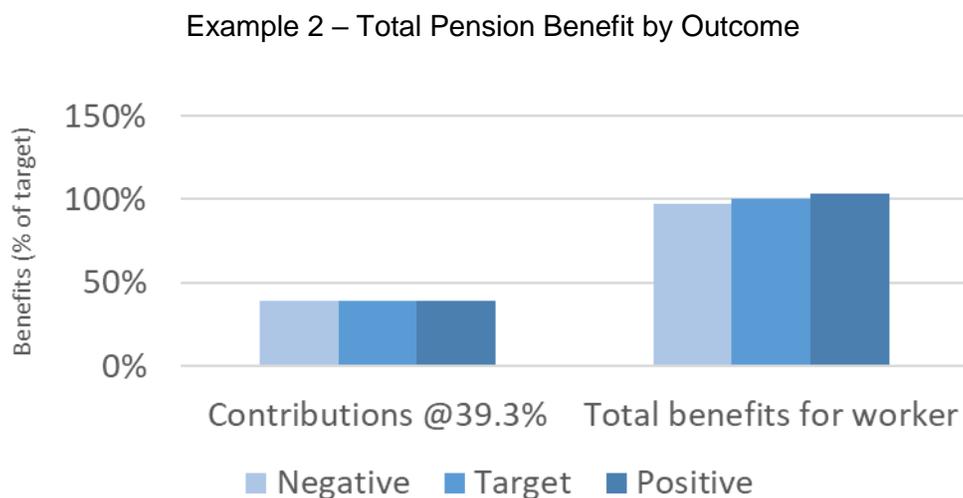


Example 2: No Risk-Sharing, Fixed Income Portfolio, 39.3% Contribution Rate

In the second example, the worker once again contributes to her own notional account without sharing any risk with others. The fund manager responsible for investing her money aims to reduce her portfolio’s volatility by switching the asset allocation to 100% fixed income. Example 2 assumes that the portfolio’s average return is now 2% with a standard deviation of 1%. The worker’s pension benefits should fluctuate little from year to year.

However, to make up for lower returns caused by a more conservative asset allocation, both worker and employer need to increase their contribution rates significantly. In Example 2, the total contribution rate is now set to 39.3% to allow the worker to meet her target pension of 70% final salary.

The main advantage of an all-fixed income configuration is the reduced fluctuation in pension benefits. As the chart below shows, the amount paid out will remain close to target, no matter whether the market conditions are negative or positive.



Example 3: Intergenerational Risk-Sharing, Balanced Portfolio, 11.5% Contribution Rate

The third example retains the hypotheses from the first example (i.e., 11.5% contribution rate, 70% equities and 30% fixed income asset allocation, 6.5% portfolio average return, and 8% standard deviation). Furthermore, it introduces risk-sharing by making use of the reserve in the pension scheme. Throughout the worker's active years, the reserve captures some of the surplus in years where the following 3 conditions are met:

- Her notional account's return for the year is positive; and
- Her notional account's actual balance is above its target balance; and
- The pension fund's reserve hasn't already reached its cap of 15% of total assets.

The calculation of the target balance assumes that the fund delivers the expected return throughout the worker's life-cycle. In formal pension terminology, it is known as a "going concern" target.

In the advent of negative returns in the worker's notional account, an amount can be taken from the reserve to cover some of the deficit incurred when the following conditions are met:

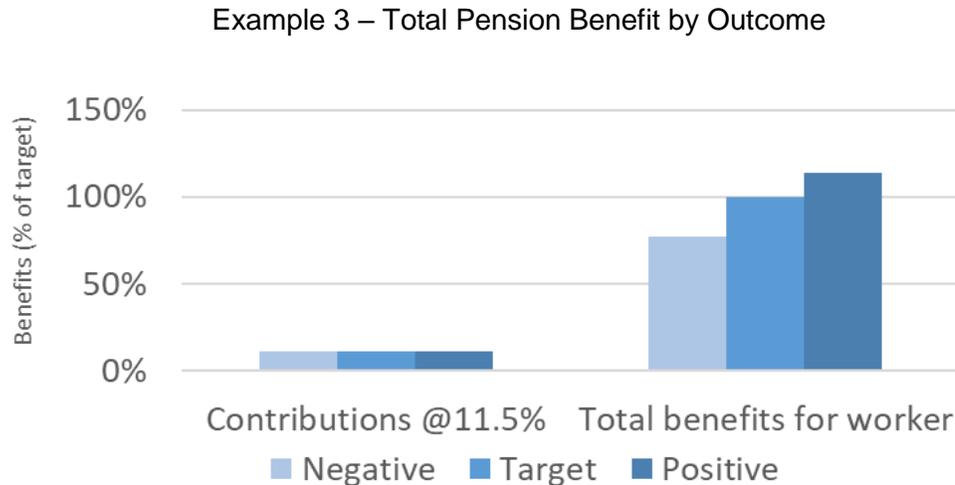
- Her notional account's actual balance is below the target balance; and
- The pension fund's reserve is not depleted.

The main purpose of the reserve is to accumulate a buffer in good years that can be used in bad years to reduce volatility and smooth out benefits. The reserve also exists indefinitely, meaning that any leftover can be used by subsequent workers that join the pension.

Example 3 assumes that a reserve of 10% of total assets already exists at the time the worker starts contributing to the plan at age 25. It also assumes that the funds that flow into the reserve are invested in the same balanced portfolio as the worker's notional account.

The details of the reserve transfer and withdrawal mechanisms are laid out in the financial model that the Bouwen board has shared with you. The currently solidarity transfer parameter has been set at 10%, which means that roughly speaking, 10% of the dollar gain on the notional account's investment is shared with the reserve (subject to the previous conditions).

When compared with the chart from Example 1, the chart for Example 3 below reflects that there is less volatility, which stems from the intergenerational risk-sharing enabled by the reserve. It shows that the worker's benefits are less affected in a negative scenario, with a potential reduction of approximately 22% (compared to 27% in Example 1). However, having to put money in a reserve also means that the worker's benefits may only be increased by approximately 14% in the event of a positive scenario (compared to close to 20% in Example 1).



So far, the board hasn't yet come up with a design that has unanimous approval from its members. While there exist many options, a bad plan design could have a severe impact on the levels of pensions being effectively paid out to workers. While a number of simplifying assumptions have been used to build the financial model and to come up with the above 3 examples, the board has agreed on a few parameters that should not be modified:

- The contribution rate must be constant throughout the worker's active years (i.e., once the contribution as a percentage of salary is decided, it should not vary from year to year).
- The target pension benefit is 70% of the employee's final salary.
- The worker receives a first pension benefit at age 61. Construction workers typically retire earlier than other types of workers since their work is physically demanding.
- The total contribution rate must not exceed 40%.
- The reserve, if there is one, must be capped at 15% of total assets.

Conclusion

As Max Aarden reviews the documents that his board has prepared for your team, he is hopeful that you will be able to help Bouwen design a sustainable CDC strategy that will benefit its members across generations. He wants to remind you that the examples provided above are purely for illustration. He is looking to receive your team's unique set of recommendations about asset allocation, rate of contributions, and risk-sharing rules.

Report Guidelines

For their proposals, participants should submit a 1-page executive summary and a detailed report. The report should not exceed 7 pages (excluding the executive summary, references and appendices). There are no required fonts nor text formatting, but the report will be evaluated based on its clarity, presentation, and conciseness.

The submission should not contain any indication of the participants' university to avoid any bias from the judges. Instead, participants should create an alternative team name for their investment consultancy firm working with Bouwen. This alternative name should also bear no link to the team's university name nor location, to ensure the fairness of the competition.

Participants are expected to propose an alternative pension investment model that looks at the contribution level, risk-sharing formula, and asset allocation for Bouwen's €30 billion fund starting in January 2022. They are free to pursue their investment strategy in any direction, as long as they propose realistic and feasible solutions.

The case is intentionally designed to be open-ended. Participants should feel free to make assumptions wherever needed and use any data they see fit. All facts presented in the case merely act as guiding points, so the participants are free to incorporate only the sections that they need.

We strongly recommend that participants take a look at the 1) pedagogical notes about past winning proposals available on the MIPC website, and 2) the post-mortem documents from previous MIPC editions. These documents will give participants a lot of clues about what judges look for in winning proposals.

Sources and Notes

¹ Everything related to Bouwen is entirely fictional, including its structure, asset allocation, mandate, and investment strategy. Any aspect of Bouwen reflecting similar or identical decisions taken by a Dutch pension plan is purely coincidental.

² [http://www.fiapinternacional.org/wp-content/uploads/2021/01/Pension Note No.50 2020 MERCER CFA World Pension Index.pdf](http://www.fiapinternacional.org/wp-content/uploads/2021/01/Pension_Note_No.50_2020_MERCER_CFA_World_Pension_Index.pdf)

³ <https://countryeconomy.com/gdp/netherlands?year=2020>

⁴ <https://data.worldbank.org/indicator/SP.POP.TOTL?locations=NL>

⁵ <https://www.statista.com/statistics/276713/distribution-of-gross-domestic-product-gdp-across-economic-sectors-in-the-netherlands/>

⁶ <https://www.pensioenfederatie.nl/website/the-dutch-pension-system-highlights-and-characteristics>

⁷ <https://apg.nl/en/publication/the-reason-why-the-dutch-pension-system-is-the-best-in-the-world/>

⁸ <https://www.oecd-ilibrary.org/sites/aadaadc3-en/index.html?itemId=/content/component/aadaadc3-en>

⁹ <https://www.ipe.com/news/parliament-agrees-to-dutch-pensions-reform-but-questions-remain/10046855.article>

¹⁰ <https://www.willistowerswatson.com/en-GB/Solutions/services/collective-defined-contribution>

¹¹ https://www.aon.com/getmedia/a745af28-9106-4e25-a09a-bdf4f5ead150/The-Case-for-Collective-DC_update_2020.aspx

¹² <https://knowledge.wharton.upenn.edu/article/far-pension-funds-drive-sustainable-investing/>

¹³ See endnote 8

¹⁴ <https://www.london.edu/think/investing-in-a-low-yield-world>

¹⁵ <https://tradingeconomics.com/netherlands/government-bond-yield>

¹⁶ <https://www.advisorperspectives.com/articles/2020/07/20/the-remarkable-accuracy-of-cape-as-a-predictor-of-returns-1>

¹⁷ <https://www.ft.com/content/211ab2b8-7af6-40fe-96b2-04f7704dac73>

¹⁸ <https://www.pggm.nl/en/blogs/dutch-solvency-framework-costing-pension-funds-billions/>

¹⁹ <https://www.oecd.org/finance/financial-markets/48537395.pdf>

²⁰ <https://www.pensioenfederatie.nl/website/investment-management>

²¹ https://www.researchgate.net/figure/The-map-shows-that-55-percent-of-the-Netherlands-is-flood-prone-26-percent-is-below-sea_fig4_273681624

²² <https://reliefweb.int/sites/reliefweb.int/files/resources/WorldRiskReport-2020.pdf>

²³ Exact regulations in the Netherlands are being determined as we speak. For the purpose of the case, we assume that solvency rules will be eliminated for CDCs.

²⁴ See endnote 10

²⁵ <https://www.oecd-ilibrary.org/sites/aadaadc3-en/index.html?itemId=/content/component/aadaadc3-en>