

PPI Briefing Note Number 139

This Briefing Note is the second in a series which explores Collective Defined Contribution (CDC) pension schemes and how they might operate in the UK. The series of Briefing Notes, and all associated research, is funded by a grant from the Nuffield Foundation. It follows the first Briefing Note which was titled, <u>How might CDC develop in the UK?</u>^[1] which described the current state of CDC. It identified a lot of anticipation, as many hope or expect that CDC will provide some key benefits which are hard to find elsewhere in the pensions landscape. It also identified a lot of barriers to implementation, as there are still problems that need to be addressed before CDC can be more widely implemented.

The Nuffield Foundation is an independent charitable trust with a mission to advance social wellbeing. It funds research that informs social policy, primarily in education, welfare and justice. The Nuffield Foundation is the founder and cofunder of the Nuffield Council on Bioethics, the Ada Lovelace Institute, and the Nuffield Family Justice Observatory. The Foundation has funded this project, but the views expressed are those of the authors and not necessarily the Foundation. Website: www.nuffieldfoundation.org Twitter: @NuffieldFound



Introduction

This Briefing Note examines the performance of single and multi-employer CDC schemes compared to other products, to see if they offer advantages over other pension products or each other, and explores the implications of having multiple employers in the same scheme. To do this, it uses an accompanying model ^[2], developed by King's College London, which simulates single and multi-employer CDC schemes. The single employer model takes scheme design elements from the Royal Mail's CDC scheme which opened in 2024. The multi-employer model is similarly based on input from expert stakeholders within the industry in order to simulate, as closely as possible, what multi-employer CDC schemes could look like in the future.

PENSIONS POLICY INSTITUTE

PPI Briefing Note Number 139

Key findings:

The key findings of this Briefing Note are:

- A single employer CDC scheme outperforms an equivalent Defined Contribution (DC) scheme regardless of economic conditions, but to varying degrees.
- A multi-generational cross subsidy effect, which is also observed in an equivalent Defined Benefit scheme, is present in the single employer scheme. This leads to later generations subsidising the earliest generations in the scheme.
- A multi-employer CDC scheme outperforms a single employer scheme and offers a higher retirement benefit, owing to different operating principles.
- There exists a potential for cross subsidy between demographic groups with different mortalities. This could be addressed by either:
 - ♦ Creating multiple sections within the scheme each with a homogeneous membership;
 - Ounderwriting each member and pricing benefits accordingly, but it may not ensure fairness as reliably as keeping different memberships separate.

Single Employer CDC vs Multi-Employer CDC scheme design

Two forms of CDC schemes have been modelled: single employer and multi-employer schemes.

The single employer scheme is modelled on the same principles as the Royal Mail's CDC scheme that opened in 2024. In the scheme, each employee receives a fixed nominal benefit entitlement each year, such as 1/80th of their average lifetime salary, in exchange for a fixed employee contribution. That is, when any member in this scheme buys benefits, they receive an entitlement that is proportional to their contribution, irrespective of their current age. This means that the oldest members of the scheme, who join shortly before their retirement when the scheme opens, will make contributions which will not have had time to accumulate the aggregate degree of investment return upon which the benefits are priced. To enable everyone in the scheme to have the same benefit entitlement, subsequent members need to subsidise this first generation.

This scheme may need a certain level of employer contribution to make it attractive to members. This employer contribution must be more significant than the extent these young contributors must subsidise older members.

These effects are also present in Defined Benefit (DB) schemes. In the case of the Royal Mail, or any employer that wishes to replace their DB scheme with a DB styled version of CDC, this could be an intentional design choice that replicates the operation of their previous scheme.

Multi-employer schemes, by comparison, must work differently. Beyond allowing multiple employers to join and offer membership to their employees, the implications of which are discussed below, there are also differences in the scheme's design.

Multi-employer schemes cannot offer a fixed benefit entitlement in the manner of a single employer scheme. Employers may differ in preferred contribution rates, preferred retirement benefits, as well as the demographic composition of their workforce. The future membership cannot be predicted ahead of time, due to the commercial nature of how many new employers will join the scheme, and what their characteristics will be. As a result, a multi-employer scheme cannot target a specified retirement benefit. Rather, it must operate like a Defined Contribution (DC) scheme where contributions are fixed and the retirement benefit is unspecified. Members will buy benefit entitlements that are priced according to the current state of the scheme and as members age these benefits will be indexed according to the scheme performance. This would mean that someone who joined the scheme shortly before retirement would receive a benefit that did not reflect a subsidy from newer members. However, as investment return accumulated, their benefit would also increase in line with the benefit of every other member.

PENSIONS POLICY INSTITUTE

PPI Briefing Note Number 139

Single Employer CDC scheme results

Comparison of outcomes to an individual DC arrangement

The single employer CDC scheme model used in this Briefing Note operates on the same principles as Royal Mail's, and is an approximation of the scheme, allowing for modelling assumptions. The model has been used to estimate the retirement outcomes of members of this scheme, and alongside these results, their outcomes if they had made equivalent contributions towards a DC pot and then bought an annuity.

The single employer CDC scheme outperforms equal contributions made to an individual DC scheme used to purchase an annuity. The single employer scheme provides an average replacement rate of 47%, compared to the 40% that an annuity would provide, when modelled in a variety of economic scenarios representing a range of economic conditions. (Details of how these scenarios were generated are in the appendix.)

The performance of the single employer scheme remained higher in extreme economic circumstances, with the 90th and 10th percentiles of performance across all scenarios being a replacement rate of 21% and 156% for a single employer CDC scheme, and 17% and 107% for an annuity [Figure 1]. This suggests that single employer CDC scheme would provide a more adequate retirement income compared to a DC scheme, as well as providing better protection against the worst economic conditions.

Figure 1



This suggests that single employer CDC schemes provides a better retirement outcome on average than an individual DC and annuity arrangement. It also shows that, in the best economic conditions, CDC is better placed to capitalise on these conditions through higher exposure to growth assets than a typical DC investment strategy. Lastly, these results also suggest that CDC offers some extra protection against the worst economic conditions, though the difference between



PPI Briefing Note Number 139

the schemes is not as pronounced as it is in times of strong economic performance. Those who retire in poor economic conditions may buy an annuity at a relatively high price, whereas this concern does not exist for CDC.

The fact that single employer CDC schemes appears to outperform an annuity in a range of economic conditions make it well suited for the purposes that it is intended to serve: on top of protection against longevity risk, it provides a more adequate retirement income, and also by not being as sensitive to poor economic conditions. It also does not require complex decisions on the part of the member. In short it does not create circumstances where members can be "caught out" by opting to join a CDC scheme when they would have had a better outcome joining an equivalent DC plan instead.

Multi-Employer CDC scheme results

Multi-Employer CDC schemes cannot yet operate in the UK and there are still policy design options for the legislative framework in which it might operate. Nonetheless, many are of the opinion ^[1] that multi-employer schemes are needed to fully unlock the potential of CDC to deliver better outcomes for pension scheme members.

Multi-employer schemes are anticipated to have a space in the pension landscape because there are several barriers to implementation that prohibit smaller employers from creating a single employer CDC scheme. There are costs, such as the cost of a wind-up reserve, advisor fees, and seeking and gaining authorisation that make single employer CDC schemes prohibitively expensive to all but the largest employers. Many larger employers have switched their workplace pension provision from DB to DC, which restricts the pool of potential single employer CDC schemes, as many may not want to change their pension scheme a second time within such a short window.

Multi-employer schemes can avoid or mitigate these barriers to implementation experienced by single-employer schemes. The setup costs would be less of a barrier for multi-employer schemes, having a wider base to spread the cost. The largest pension providers may have no issues paying the initial setup costs, so long as the overall proposition were still profitable overall. Some non-commercial sectoral schemes, however, may still find the setup costs to be a significant factor. For employers who may be wary of changing their pension scheme yet again, joining a multi-employer CDC scheme could look much the same as joining an individual DC master trust. If there were a mature multi-employer CDC market available, employers who are currently members of individual DC master trusts might find the transition simple. Lastly, by pooling employees from different employers together, it makes CDC accessible to any employer of any size.

There are a number of hurdles to implementation of multi-employer CDC schemes ^[1]. For providers, multi-employer CDC presents some risks. If they commit to the idea and it fails, they may face reputational harm, or fail to turn a worthwhile profit. For legislators, there would be significant effort involved in producing the legislation, and they would not want to make this effort until providers express a desire to operate multi-employer schemes. For this reason, it may take empirical evidence of the viability of CDC from the Royal Mail to make providers and legislators commit fully to the idea.

Allowing multiple employers into the same scheme has implications for the operation of the scheme itself. There is potential for cross subsidy between groups of members with different life expectancies. While all forms of CDC are vulnerable to this to some degree, it is a particular concern for multi-employer schemes.

Cross subsidy can happen if the price a member is offered to buy benefits does not account for their life expectancy accurately. Multi-employer CDC is more vulnerable to this than single employer CDC because of the potential diversity of the membership. Within a single employer, such as the Royal Mail, most employees will be broadly similar in terms of their demographics, wealth, and overall quality of life. Furthermore, if there are stark differences between different sections of the workforce, the employer is more likely to be aware of this and be well placed to account for it. On the other hand, within a multi-employer scheme, one could imagine two very different employer profiles: one employer might have well paid employees, who live in an area with high life expectancy, working in an office and with employee health benefits; another employer might employ people who work in physically demanding conditions, in an area with lower quality of life and less pay.

If a member's life expectancy is underestimated, they are likely to get more out of the scheme because the price they were charged was not enough to generate the benefit they will receive throughout their life. Conversely, if a member's life expectancy is overestimated, they are likely to die before they receive a benefit commensurate with the contribution



PPI Briefing Note Number 139

to the fund that they made in their working life. In these cases, the scheme may appear to function adequately overall, but these members may feel that they have paid more than their fair share to enable the retirements of those who have not paid enough. This effect may appear especially unjust in members' eyes considering that life expectancy and wealth are generally linked, and the members with lower life expectancies may see this as transferring their wealth to those already wealthier than them.

In a multi-employer scheme, new employers will join, and bring with them a diverse membership that is not known in advance. The scheme will have to account for this somehow. They may use underwriting to price the benefits of members, or they may try and ensure that a given scheme's membership is broadly homogeneous, for example by only making it available to certain industries. A single provider, as a result, may offer multiple schemes or sections within a scheme targeted at different profiles.

To illustrate the effects of cross subsidy, we have modelled a scheme with two types of employers: employers where employees have a higher life expectancy, and employers where employees have a lower life expectancy. To attain reasonable, but different, mortality profiles for these employers, the simulation uses the Office for National Statistics' (ONS) life expectancy figures for men (lower life expectancy) and women (higher life expectancy)^[3], in order to create two profiles for which figures are widely available, are easy to conceptualise, with a disparity that could reasonably occur in real life. It should be noted that underwriting based on characteristics such as gender is not allowed.

The modelling showed that, in theoretical cases such as investing in 100% risky assets or modelling economic indicators as being constant throughout the simulation, underwriting could enable a mixed scheme to offer virtually identical retirement benefits to members as if they were in separate schemes. However, when testing a multi-employer scheme with more realistic parameters underwriting was found to produce less desirable results. This is best illustrated with the mean replacement rate for each membership configuration.

To model the effects of cross subsidy, several variations of this scheme were modelled. The replacement rates given below represent a median value across a range of economic scenarios. Full details of the modelling are available in the Appendix. In every variation of the scheme, all employees are paid the same amount, and work at their employer for their entire working life. Regardless of the life expectancies, all schemes are the same size. The schemes modelled were:

- A scheme where all employers are low life expectancy employers.
- A scheme where all employers are high life expectancy employers.
- A scheme with a 50/50 split of high/low life expectancy employers, where members all pay the same price for their benefits. The price will be determined using a single estimate of life expectancy for the whole population.
- A scheme with a 50/50 split of high/low life expectancy employers, with underwriting of the members so that those
 with lower life expectancies are offered a cheaper benefit. That is, they will be offered a price very similar to what
 they would have been offered in a more restricted scheme, but the assets are still shared among a more diverse
 group.

The results demonstrated that, in a mixed scheme with no underwriting, all members receive a 90% mean replacement rate at retirement. In contrast, if these members were sectionalised by life expectancy, the high life expectancy and the low life expectancy groups would receive 80% and 100% respectively. However, in a joint scheme with underwriting, they receive 77% and 107% respectively. This is illustrated in Figure 2.

This demonstrates that underwriting could overcompensate and reduce the retirement outcome of the high life expectancy group, by subsidising the low life expectancy group. In this case, it would not be in the interests of the low life expectancy group to join a mixed scheme with no underwriting, and it would not be in the interests of the high life expectancy group to join a mixed scheme with underwriting. This would leave both groups with only one option, which would be sectionalised schemes.

PENSIONS POLICY INSTITUTE

PPI Briefing Note Number 139

Figure 2



These results should not necessarily be taken to demonstrate that underwriting will always overcompensate in this way. When looking at the median replacement rate achieved over the lifetime, there are no clear trends that can be observed. The modelling demonstrates that underwriting cannot always fully mitigate unfairness, despite being theoretically possible.

There could be legitimate unfairness concerns for overly diverse scheme memberships. If these kinds of inequalities are permitted to exist, the scheme may become unfair, or at least, be perceived to be unfair. The consideration for multi-employer schemes might be whether there are life expectancy inequalities at the employer level. Even if no significant inequalities exist between employers, providers of multi-employer schemes may not have the same level of knowledge of their membership as a single employer scheme might.

For a provider, the perception of unfairness may prove to be just as important as actual unfairness. The longevity difference between men and women is one of the easiest to identify, but there are others which drive differences in life expectancy and the potential for cross-subsidies. Employers may be especially engaged on behalf of their members and may be keen to identify the potential for cross-subsidies and pursue fairer outcomes on this basis. Employers may be especially likely to pursue this if they previously operated a DB scheme and have experience of the valuation mechanisms of DB schemes, or if the scheme is new and there is less perception that the scheme has already established fair valuation principles.

These results suggest how sectionalising can mitigate this issue of unfairness that arises from differences between various socioeconomic groups. It should also be acknowledged that there are limits to the use of underwriting. Even if two groups have different life expectancies on average, many individuals from the low life expectancy group will outlive many individuals from the high life expectancy group. This will be down to individual factors, and these factors should not be underwritten against, as doing so would defeat the purpose of CDC, which is to pool longevity risk. These individual factors may contribute to a person's life expectancy more than any factors that could be practically underwritten against. Likewise, some factors such as gender may not legally be underwritten against. Even for factors for which it would be valid to underwrite against, there are practical limits to how much underwriting you can do and how accurate you can be.



PPI Briefing Note Number 139

Comparing results from single employer schemes to multi-employer schemes

The modelling shows that the single and multi-employer schemes would achieve different outcomes. The multi-employer scheme outperforms the single employer scheme. The 10th, 50th and 90th percentiles of average retirement replacement rate being 20%, 70% and 334% for multi-employer CDC, compared to the 18%, 52% and 251% of single employer CDC [Figure 3].

Figure 3



Another difference between these schemes is that the single employer scheme will be subject to fewer one-off cuts and bonuses. This is because, in periods of strong performance, a single-employer scheme will offer higher levels of indexation on nominal benefits, but this does not result in higher costs for these benefits. As a result, higher levels of indexation will not be sustainable in the long-term and the indexation will tend to move to a long-term average level.

A multi-employer scheme will also offer higher levels of indexation during periods of strong performance, but in order to minimise any cross-subsidies between employers, the cost of new benefit entitlements will also increase. As a result, there is less tendency for the indexation to move to a long-term average and as a result more periodic bonuses and benefit cuts are required in a multi-employer scheme to keep the indexation level within set bounds.

Further results

The model displays significant sensitivity to the economic and scheme parameters. By varying the age of the oldest and youngest members contributing to the scheme, expected investment returns, and the targeted indexation level, there could be significant variation in the relative performance of single and multi-employer CDC schemes when compared to an individual DC arrangement. As a result of decreasing the period of contributions, from the period between ages 18 and 66 years old to the period between ages 25 and 65, the average lifetime replacement rate for an annuity drops:

- from 40% to 32% for an individual DC and annuity
- from 47% to 40% for a single employer CDC scheme

PENSIONS POLICY INSTITUTE

PPI Briefing Note Number 139

• from 69% to 50% for a multi-employer CDC scheme

Additional permutations are given in Table 1. A full description of model and scheme parameters used are available in the Appendix.

Table 1

Age Range	Stock growth	Target level	Annuity RR	Single CDC RR	Multi CDC RR
18-66	Default + 0%	CPI + 1%	40%	47%	69%
18-66	Default + 0%	CPI + 0%	32%	36%	57%
18-66	Default - 1%	CPI + 1%	49%	64%	86%
18-66	Default - 1%	CPI + 0%	38%	48%	70%
18-66	Default + 1%	CPI + 1%	33%	35%	57%
18-66	Default + 1%	CPI + 0%	27%	28%	48%
25-65	Default + 0%	CPI + 1%	32%	40%	51%
25-65	Default + 0%	CPI + 0%	26%	32%	42%
25-65	Default - 1%	CPI + 1%	39%	54%	63%
25-65	Default - 1%	CPI + 0%	31%	42%	52%
25-65	Default + 1%	CPI + 1%	27%	31%	42%
25-65	Default + 1%	CPI + 0%	22%	25%	35%

Conclusion

CDC pension schemes can offer better returns than equivalent DC pensions. The single employer model is expected to provide an alternative to DC which should deliver more higher pensions for members on average, both in times of particularly strong or weak economic performance. However, it may be hard to quantify this benefit, as the relative performance of CDC over an equivalent DC plan is sensitive to economic conditions and scheme design.

Single and multi-employer CDC schemes produce different results, with single employer schemes that choose to offer a fixed benefit entitlement requiring some intergenerational cross-subsidy.

Finally, this Briefing Note identifies an unfairness challenge that exists for CDC. The modelling results highlight a particular kind of unfairness between socioeconomic groups to which multi-employer CDC is vulnerable. The modelling also demonstrates that sectionalising schemes may effectively mitigate this unfairness by isolating the different longevity risks of these groups. The use of underwriting in a single section may also mitigate unfairness, but comes with challenges, and may not be able to prevent systematic cross subsidies which cause the unfairness as effectively.

PPI Briefing Note Number 139

Appendix

An Economic Scenario Generator (ESG) is used to provide a range of plausible economic futures in which the schemes can be modelled, so that the performance of the schemes can be assessed in a range of economic circumstances. These economic scenarios contain risk factors such as CPI, as well as returns for different asset classes, which enable modelling of portfolio-based investment strategies and lifestyling. Full details of the operation of the Economic Scenario Generator used can be found here: ^[4]

In order to provide median views to the ESG, OBR Long Term Economic Determinants^[5] were used. The only parameter for which the OBR did not have a published value was dividend yield, for which the FTSE 100 dividend yield of 3.57% was used.

Full details of the CDC model can be found in this paper: Intergenerational cross-subsidies in UK collective defined contribution (CDC) funds.^[2]

High Performance computing was performed using King's Computational Research, Engineering and Technology Environment (CREATE).

When using the model above to produce the PPI Briefing Note, there are a number of parameters and assumptions used.

- Savers join schemes or save into products from until 18 until 66.
- The age distribution within a scheme is even.
- Schemes have a "full" membership from the start, with the first cohort being one year away from retirement, i.e., making one year of contributions and retiring in one year from the start date.
- Schemes make use of lifestyling in other words, on the basis of the age distribution of the membership at any given point, that assets are assigned to risky/non-risky assets (equities/bonds) in a way that reduces the risk profile as the membership ages. On a per member basis, we model that between ages 65 and 85, assets are tapered down from 100% to 0% risky assets.
- When modelling the single employer scheme, the targeted benefit is 1/80th of salary on a career average basis. The contribution rate will be determined on the basis of whatever is needed to achieve the target retirement benefit.
- We propose that, for the multi-employer scheme, the contribution rate mirrors that which is required by the single employer scheme, in order to make the two comparable.
- CDC schemes will target a benefit increase in line with CPI, and will be bounded at a maximum value of CPI+5%, and a minimum value of 0%, and will target an indexation of CPI+1%.
- The membership size for the single employer scheme will be based on the size of the Royal Mail workforce, which would make for approximately 3000 members in each age cohort.
- The membership size for the multi-employer scheme will be set at whatever is used for the single employer scheme to make the two comparable.
- Figures are quoted at generation 60, as these will be from when the scheme has achieved a "steady state", meaning that no unusual effects that are only observed during scheme startup will be present in the results.

PENSIONS POLICY INSTITUTE

PENSIONS POLICY INSTITUTE

PPI Briefing Note Number 139

References

[1] Wilkinson, L. Pensions Policy Institute. (2024). Briefing Note 137 - How might CDC develop in the UK? Available at: www.pensionspolicyinstitute.org.uk/research-library/research-reports/2024/2024-05-15-briefing-note-137-how-might-cdc-develop-in-the-uk/

[2] Armstrong, J., Dalby J., Donnelly, C. (2024). Intergenerational cross-subsidies in UK collective defined contribution (CDC) funds. Available at: <u>johnarmstrongmaths.com/publications/resources/CDC_Operation_Draft.pdf</u>

[3] ONS (2024). National life tables – life expectancy in the UK: 2020 to 2022. Available at: <u>www.ons.gov.uk/</u> <u>peoplepopulationandcommunity/birthsdeathsandmarriages/lifeexpectancies/bulletins/</u> <u>nationallifetablesunitedkingdom/2020to2022</u>

[4] Maffra, S. Armstrong, J. Pennanen, T. (2020) Stochastic modelling of assets and liabilities with mortality risk available at: <u>arxiv.org/pdf/2005.09974</u>

[5] OBR (2024) Fiscal risks and sustainability – September 2024. Available at: <u>obr.uk/frs/fiscal-risks-and-sustainability-september-2024/</u>



This Briefing Note is authored by:

John Upton (Policy Analyst)

e: johnupton@pensionspolicyinstitute.org.uk

w: www.pensionspolicyinstitute.org.uk

For more information please contact John.