

Some case studies

Purpose

In this report we demonstrate how we have used scenarios to enable some of our clients to consider the potential impact of climate change on pension scheme funding.

In September 2018 we produced our note “Climate Change Challenges – Climate change scenarios and their impact on funding risk and asset allocation”. The purpose of this note is to show how we have used these climate change scenarios for a couple of clients.

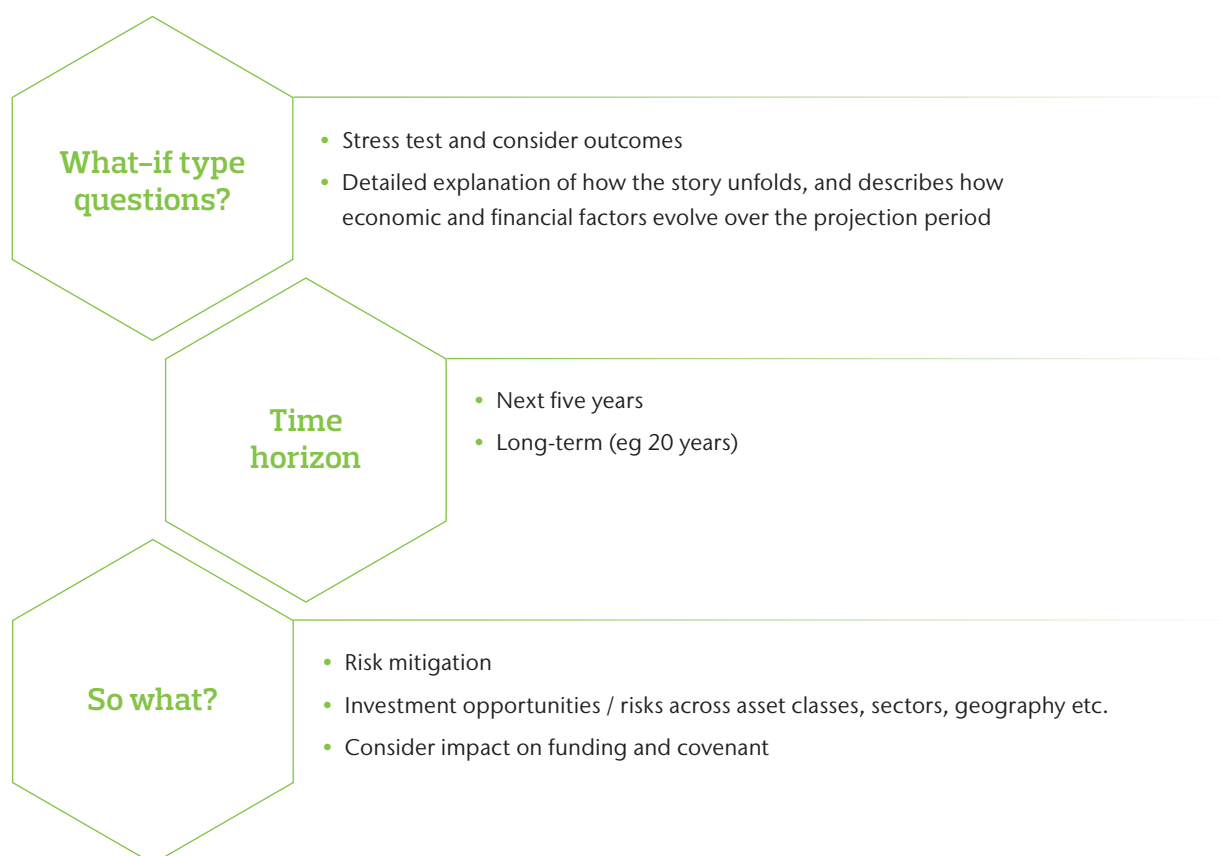
Our **Deterministic scenarios** are a way of enabling trustees and companies to ask “What if...?” type questions:

- These are used extensively to stress test and consider the impact of different events / outcomes
- These are designed to sit alongside our stochastic models
- Each scenario provides a detailed explanation of how the story unfolds, and describes how economic and financial factors evolve over the projection period

Our climate change scenarios are considered over different time horizons:

- A long-term horizon (eg 20 years) over which physical climate change impacts are likely to be felt
- A short-term horizon (eg 5-10 years) because the impacts of financial markets could be felt a lot earlier

The main purpose is to allow the trustees and companies to understand the risks (and opportunities) from climate change. This then provides a framework to consider how these risks can be managed and opportunities taken.



Scenarios

We have developed four climate change scenarios which differ depending on when action is taken, the scientific evidence and the extent to which new technologies are developed.

Narrative

We have described our climate change scenarios in the context of the following factors:

- Technology – the advance and take-up of clean technologies
- Policy – extent to which governments co-ordinate action globally and introduce greenhouse gas taxes and/or caps
- Regulation – extent to which legislation and/or litigation develops to punish companies that do not take sufficient action
- Economic factors – impact on economic growth and corporate profitability. Extent to which assets become stranded
- Social awareness – pressure from investors, employees and activists
- Scientific evidence – the predicted temperature increases and impact

Predicting the impact of climate change is very difficult and we have just produced a few plausible scenarios. They are intended to help provide insight into some of the risks and opportunities that may arise. There are many possible others. It should also not be forgotten that climate change is only one of the many long-term risks that could impact on the scheme.

Base case scenario

The scenarios need to be set relative to a base case, which we have taken as returns being in line with what is priced into the market. This means that some progress is made to limit greenhouse gas emissions and the effects of climate change are not as bad as climate scientists predict.

Climate change scenarios

Fuller descriptions of our climate change scenarios are included in our 'Climate Change Challenges' note but they are briefly described below:

- **Green Regulation** – immediate and coordinated action to tackle climate change using taxes and regulation
- **Green Skies** – in addition to tiered green regulation there is also rapid advancement of green technology and private innovation
- **Forced Green** – little is done for five years but then sufficient scientific evidence arises/social awareness increases (eg through increasing extreme weather events) such that governments are then forced to address greenhouse gas emissions
- **No Mitigation** – little sustainable policy action is undertaken over the next ten years but eventually the market participants grasp the implications of climate change. There is then an expectation of a permanent future loss and the market reacts accordingly

The first three scenarios are projected to limit global warming to +2°C. The No Mitigation scenario is projected to lead to global warming of +4°C

Case study one

The trustees were receptive to the climate change risk but wished to understand it prior to considering any action.

Background

The pension scheme had around £1bn in assets as at 31 March 2018. It was invested in around 50% growth assets (in quite a diversified way) and around 90% of the liability interest and inflation rates were hedged.

The long-term objective of the trustees was to get to a self-sufficiency funding position of around gilts+0.5% pa. The remaining period in the recovery plan was four years and these contributions together with investment returns were expected to result in the Scheme reaching its self-sufficiency target over around five to six years.

The company was in a sector which is well positioned to benefit from climate opportunities. Both the trustees and company were receptive to considering climate change and other sustainability risks but were eager to understand and see evidence of the risks before making any change.

Approach

We provided a presentation to the trustees of the pension scheme of the latest evidence of climate change and the potential impact on the environment. In this context, we presented our climate change scenarios together with the narrative behind them.

We then projected the funding level over the next ten and 20 years and compared this to the stochastic projections. The projections over the next ten years under the No Mitigation, Green Regulation and Forced Green scenarios are shown on the next page.

If the scheme were to reach its self-sufficiency it would be expected that it would de-risk. However, for the purpose of this modelling, we assumed that the same investment strategy would apply throughout.

We assumed no change in the demographic variables in these scenarios.

Impact of changing gilt yields

Pension scheme liabilities are often linked to gilt yields and there are different pressures on these:

- Nominal (and to a lesser extent, real) yields may be pushed higher in the short-term due to a substantial increase in borrowing by governments to finance green projects, which may necessitate a rise in yields to attract funds, and a spike in inflation due to higher production costs incurred by the shift away from fossil fuels.
- On the other hand, the forced reduction in emissions and a shift away from fossil fuels may lead to a drag on growth and lower yields.

In our projections, yields rise in the Green Regulation scenario and fall in the Forced Green scenario immediately after the changes to policy are made.

This scheme has hedged most of the liability interest and inflation rate risks and therefore is not significantly exposed to these. However, the impacts could be significant for other schemes.

Explanation of graphs

There is a 90% chance that the funding level will remain within the shaded area on the charts while the dashed line represent the 5th, 25th, 50th, 75th and 95th percentiles (based on current market expectations). The base case is the 50th percentile.

Output over ten years

Under the No Mitigation scenario the physical impacts of climate change do not seriously damage economic growth over the first ten years and markets react very little to what there is (so the returns are marginally below the base case).

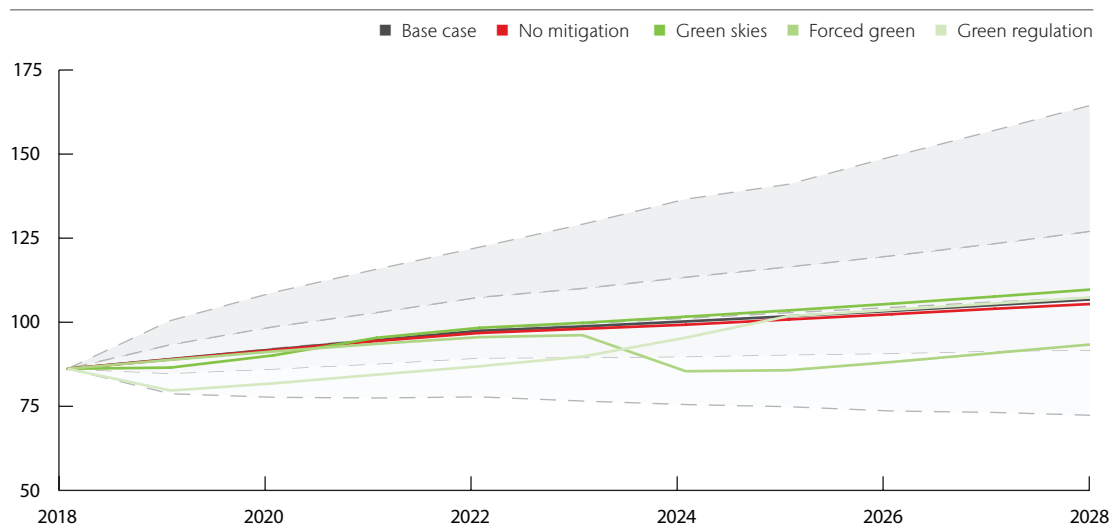
Under the Green Regulation and Forced Green scenarios the changes that are made to policy and regulation creates uncertainty and economic disruption, hampering economic growth and corporate profitability in the short term. As you can see, delaying action means that the costs of tackling the problem are higher.

Under the Green Regulation scenario, a 5% fall in funding level would happen within the next two years (whereas it would have increased by 6% under the base case scenario). The trustees considered that in this scenario the company could afford to increase contributions and/or the recovery plan extended.

In any event, the funding level would be expected to recover within this timescale as the benefits of the green policies would come through and so not all the additional contributions would be required. Therefore, this was not expected to be a significant problem.

Under the Forced Green scenario, the funding level would be 15% lower than the base case at the end of year six and therefore the scheme would not have reached its self-sufficiency target. The trustees agreed that it would be likely that the recovery plan would need to be extended and that they would not be able to carry out the desired de-risking. While this was undesirable the trustees felt that this was manageable.

Projection of funding levels over ten years



Source: Aon

Output over 20 years

The trustees also considered the projections over 20 years and these are shown below.

Under the scenarios where significant action on green policies is taken within the first ten years then the funding level does start to head back up and the long-term target is reached.

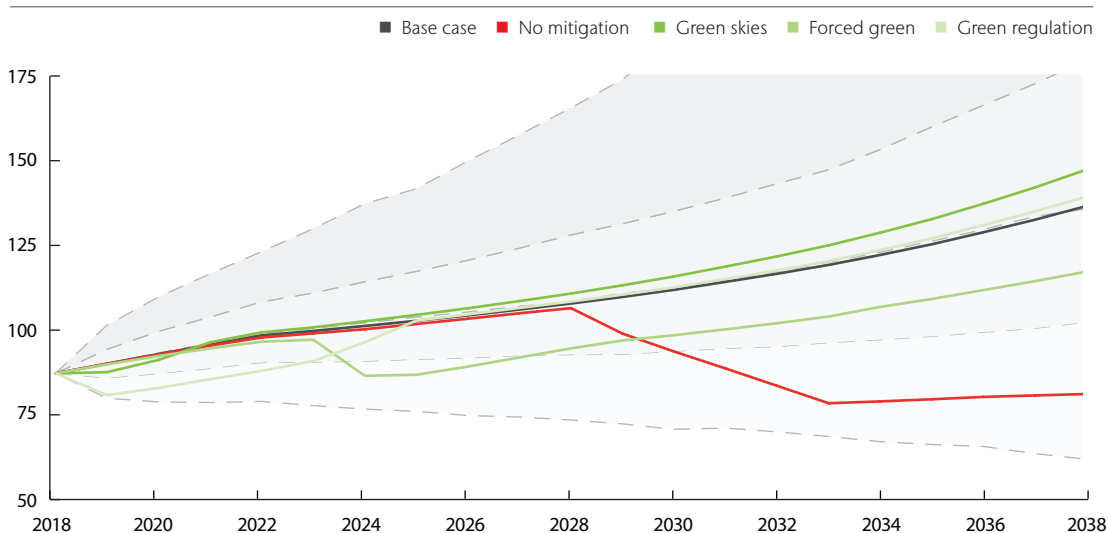
However, under the No Mitigation scenario, market values would eventually price in high levels of economic damage and irreversible loss. While more would eventually be done to mitigate and adapt to global warming, the late timing of actions would mean that they were less effective and more costly to implement.

The funding level would fall significantly between years ten and 15 and then not recover thereafter.

This would potentially be a very significant outcome. Nevertheless, the trustees felt that under this scenario they would have largely de-risked by then and would be invested in gilts and corporate bonds to match the liabilities. These assets would be less exposed to climate change risk but there would still be climate change risks:

- There could be increased default risk for many corporate bonds.
- Higher and more volatile inflation may impact on the cash-flows and so the hedging would need to be considered carefully.

Projection of funding levels over 20 years



Source: Aon

Action to be taken

While the trustees concluded that the climate change scenarios were manageable, this exercise provided the required evidence to consider how their investment strategy could be developed to take more account of climate risks.

They decided to consider the following:

- Options to screen for ESG in their equity portfolio
- ESG integration and manager engagement
- Private equity options with green focus
- Green bonds
- Infrastructure debt related to green projects
- Timber, agriculture

Case study two

The company had an ambitious emissions target and wished the pension scheme to have a similar aim. The trustees were concerned though that such a policy may have an adverse impact on investment returns.

Background

The pension scheme had around £2bn in assets as at 31 December 2017. It was invested in around 65% growth assets (in quite a diversified way) and around 30% of the liability interest and inflation rates were hedged. The scheme had just reached 100% funding on technical provisions.

The long-term objective of the trustees was to get to a self-sufficiency funding position on a gilts matching basis and it was projected to reach this in ten years based on expected investment returns.

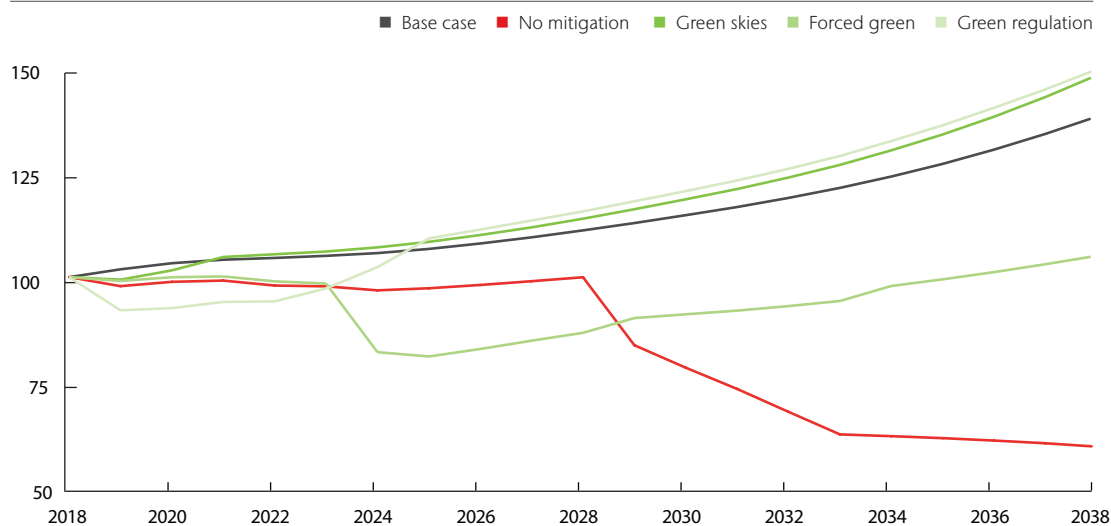
The company was international and had already set itself an ambitious emissions target and so would be less exposed to some of the transitional risks from climate change.

Approach

As for the first case study, we projected the funding level over the next ten and 20 years under our different climate change scenarios and provided an accompanying narrative.

The projections over the next 20 years under climate change scenarios are shown below.

Projection of funding levels over 20 years



Source: Aon

Output

Under the Green Regulation scenario, the funding level would fall by around 4% over the first two years (whereas it would have increased by 5% under the base case scenario). The impact is slightly lower in the second case study as a result of the scheme's liabilities being under-hedged and therefore it would benefit from higher gilt yields. The funding would then improve such that the scheme would still be expected to reach its long-term objective after ten years. Therefore, the trustees were not significantly concerned about this scenario.

Under the Forced Green scenario, the funding level would fall to 82% in 2025 whereas it had been expected to improve to 108%. The scheme would still eventually reach its long-term objective, but it would now take 20 years. While the trustees believed the covenant was strong (and action would have been taken to mitigate transitional risks from climate change), they were a little nervous about relying on the covenant for that long.

Under the No Mitigation scenario, the funding level would still be just over 100% over ten years (compared to 112% under the base case). This is worse than the first case study because inflation expectations increase over this period and the inflation risk is not hedged. Then, over the next ten years the funding level would fall to 60% as both equities and real yields fall significantly. This significant fall would be exacerbated (in funding level terms) by the maturity of the Scheme as a significant proportion of assets would be required to meet the benefit outgo. In this scenario, it would be a long way from reaching its long-term objective and this would be a significant problem for the company. Furthermore, even though the company may not be particularly exposed to the transitional risks, its customers may be and it would still be exposed to the physical risks.

Under the Green Skies scenario, after a small short-term blip, the funding level improves to above the base case.

➤ Action to be taken

The trustees are currently considering the implications of these projections. They have decided that they wish to consider their investment strategy to mitigate some of this risk.

However, should they be doing anything else?

There is probably little that can be done with regards to the company covenant other than what the company is already doing.

However, it does raise the following questions:

- Should the trustees be trying to get to full funding quicker to reduce the risk that they will be hit by a sudden and significant market correction in the medium- to long-term? Of course, this isn't just a climate change risk but there are other long-term risks too.
- What measures can the trustees put in place to try and receive advance warning so that they can react before it is too late?

Summary

Climate change and the efforts made to tackle it will inevitably affect investment returns (and hence pension funding levels) globally.

Climate change risks

Man-made climate change is one of the biggest threats humanity faces today. The effects of climate change are already evident with more erratic weather patterns, more severe weather events and greater environmental degradation.

The systemic risks posed by climate change and the policies implemented to tackle them will fundamentally change economic, political and social systems and the global financial system. They will impact every asset class, sector, industry and market in varying ways and at different times, creating both risks and opportunities for investors. It is therefore a worthwhile exercise to consider how events might unfold and the possible implications.

We consider four potential climate change scenarios (covering a broad spectrum of outcomes) and their potential impact on assets and pension scheme funding levels.

The high degree of uncertainty surrounding climate change means that the final outcomes may look very different to those outlined. However, the themes illustrated in our scenarios are expected to be relevant when understanding risks and/or considering asset allocation decisions.

Impact

The potential impact of climate change on pension scheme funding levels will vary significantly from scheme to scheme depending on the investment strategy and the liability profile.

However, our scenarios demonstrate that over ten years, the transitional risks involved with climate change could easily reduce the funding level by 20%. Over longer periods, the impact could be far greater. This risk can be mitigated to some extent. For example, some action can be taken now through the scheme's investment strategy but trustees may also wish to consider how they could identify risks in advance and be ready to react should they look likely to materialise.

In both these case studies, the company has been very supportive and is already taking action itself to mitigate the risks of climate change. However, as more trustees become aware of the risks and are looking to take action, we can see more consideration of what will happen to the covenant in different scenarios. This may then start a dialogue with the company as how they can manage these scenarios more effectively.

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