

Chapter 16

Investment

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16.1 Investment

Crudely speaking there are two sides to insurance – the assets and the liabilities. Whilst most of this report is focused on the liabilities, this chapter will look at the assets.

An insurer is an institution that is contracted to pay a policyholder on the occurrence of an uncertain event. This event could be, for example, an insurance claim (non-life insurance), the death, survival or illness of an individual (life and health insurances) or the retirement and survival of an individual (pension). Not only the occurrence of the event, but in some cases the amount of payment are subject to uncertainty. The future payment of the uncertain event is termed the liability.

To increase the probability of payment of future (uncertain) liabilities, an insurer calculates reserves and capital. These liabilities are backed by investment assets. The assets are usually invested in a mixture of traditional investments, usually cash, bonds and equity, but also property, commodities and hedge funds. Insurance company assets are considerable (for example, \$1.2 trillion by UK based companies¹).

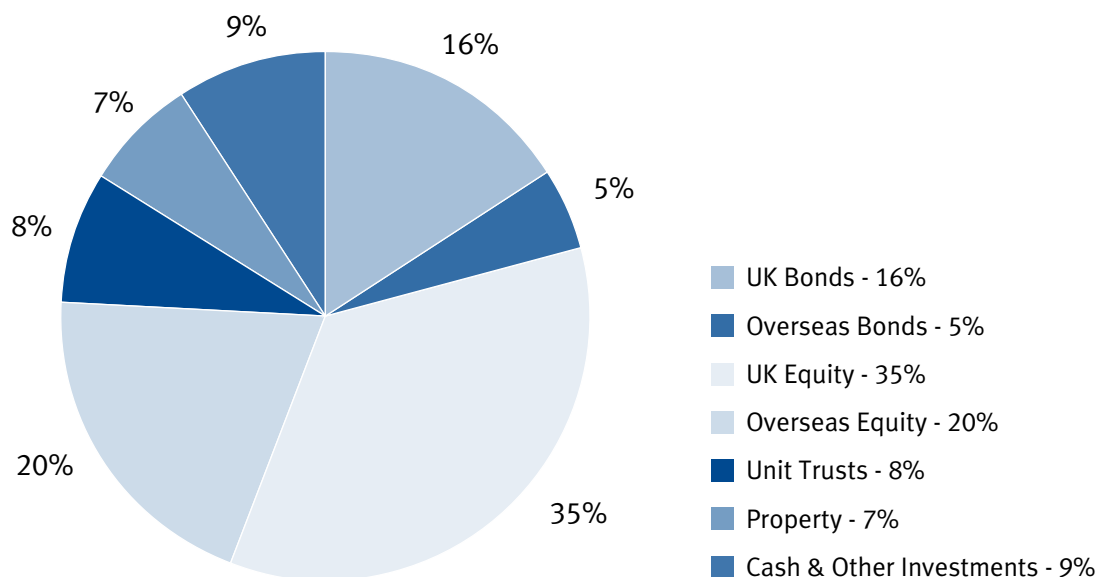
The purpose of the assets are to pay the liabilities as and when they become due. So the insurer invests not necessarily to achieve the maximum return, but to minimise the risk of not being able to meet liabilities (of course all other things being equal, the higher return on the assets, the lower risk of not meeting liabilities, so the two are related). Assets must also be sufficient to meet solvency requirements.

What is the effect of climate change likely to be on insurer’s assets? To examine this we need to know what those assets are. This is complicated by the fact that different lines of business will have different asset mixes:

1. Short -term business (for example motor insurance): mostly cash and short term bonds
2. Long-tailed business and life insurance: mostly bonds with some equity
3. Unattached capital and pensions: a mixture of equity, property, bonds and cash

Figure 1 shows the split of UK insurance company investments by asset class. The largest class is equity which accounts for over half of assets.

Figure 1: UK Insurance company investment by asset class²



¹ ABI website

² ABI website

Table 1: Risks and opportunities of climate change for asset management

Asset Type	Threat	Opportunity
General	<ul style="list-style-type: none"> • Macroeconomic downturn hits business volume • Uneven and unpredictable impacts on global markets • Uninsured damage to assets 	<ul style="list-style-type: none"> • New markets create momentum • Upsurge in socially responsible investment (SRI)
Tradable corporate shares/bonds	<ul style="list-style-type: none"> • Carbon liabilities affect market value of securities • Climatic factors affect demand or supply or operations 	<ul style="list-style-type: none"> • Outperformance by climate leaders and best-in-sector securities • Climate-related theme funds
Other corporate, e.g. venture capital	<ul style="list-style-type: none"> • Reduction in competitiveness of ghg-intensive business 	<ul style="list-style-type: none"> • Growing demand for low-carbon technologies, goods and services
Property	<ul style="list-style-type: none"> • Global slowdown impairs long-term asset appreciation • Increased energy costs • Unplanned refit costs • Weather damage 	<ul style="list-style-type: none"> • Outperformance by climate-resilient/friendly stock
Public authority	<ul style="list-style-type: none"> • Ability to repay impaired by pressure on public purse 	<ul style="list-style-type: none"> • Increased need for publicly funded adaptation and mitigation
Other	<ul style="list-style-type: none"> • Compounded climate risk across diversified funds 	<ul style="list-style-type: none"> • Hedge funds investing in ghg credits (carbon funds) • Mezzanine finance for projects³

Source: derived from UNEPFI 2002

Table 1 outlines the wide nature of potential effects of climate change on asset values.

Asset and liability management (ALM) is the process whereby companies “investigate part or all of the future financial outcomes of a company under conditions where the assets, liabilities or both may vary” (Perroy (2005)).

Clearly climate change has an impact on both assets and liabilities, but companies traditionally model on past experience⁴. ALM will have to model future scenarios and become more forward instead of backward looking (Perroy (2005)).

I will now discuss the effects of climate change on the different asset classes separately:

16.2 Cash/short-term bonds

Typically cash and short-term bonds are held for short-term business. Premium income is “invested” and claims are paid out in the short term – typically less than a year. These investments are highly liquid, and therefore their value does not fluctuate much and is not vulnerable to external shocks⁵. Therefore, climate change is unlikely to have a large direct impact on the value of these assets.

However, in the context of matching liabilities, climate change can have a large impact on the value of liabilities (for example flooding of major cities or hurricanes hitting a number of large US cities), which is not matched by an increase in the value of these assets. The traditional method of hedging against this is through reinsurance. However, if the risk of large events increase, it may be possible that reinsurance no longer becomes available, becomes prohibitively expensive or reinsurers become insolvent. Alternative Risk Transfer (ART) mechanisms, such as catastrophe bonds and weather derivatives, can sometimes be used as a substitute for reinsurance. However, these often prove expensive and are currently small markets relative to the reinsurance market as a whole.

Long-term bonds

The value of long-term bonds is typically affected by the market’s perception of future inflation, interest rates, and governments’ or companies’ ability to pay, as well as levels of uncertainty over these values (i.e. the higher the uncertainty, the lower are bond values).

The direct impact of climate change on these variables is difficult to assess. However, as a first guess, large climate impacts are likely to increase uncertainty and thus negatively affect bond yields. Therefore by holding bonds, there is a possible

³ Mezzanine finance is intermediate between bank borrowings, and “equity”, i.e. taking a part-ownership of a project. The financier has a better rate of return on average than with conventional investments, but there is significant risk of default on individual projects.

⁴ Although this is not true for all classes, for example, catastrophe insurance sometimes looks prospectively.

⁵ With the exception of high inflation. However, as these assets are usually held to match short-term commitments, inflation is unlikely to be high enough over this time frame to have much impact on asset values.

⁶ See Stern (2006) for a much fuller discussion.

mismatch whereby climate change has a positive impact on liability values with a negative impact on asset values. Climate change may well change the long-term business or economics of businesses; the need to adapt may impact business models⁶.

16.3 Equity

Climate change has the potential to affect the whole world economy, and this will have an impact on all equity as companies' profits are ultimately linked to economic growth.

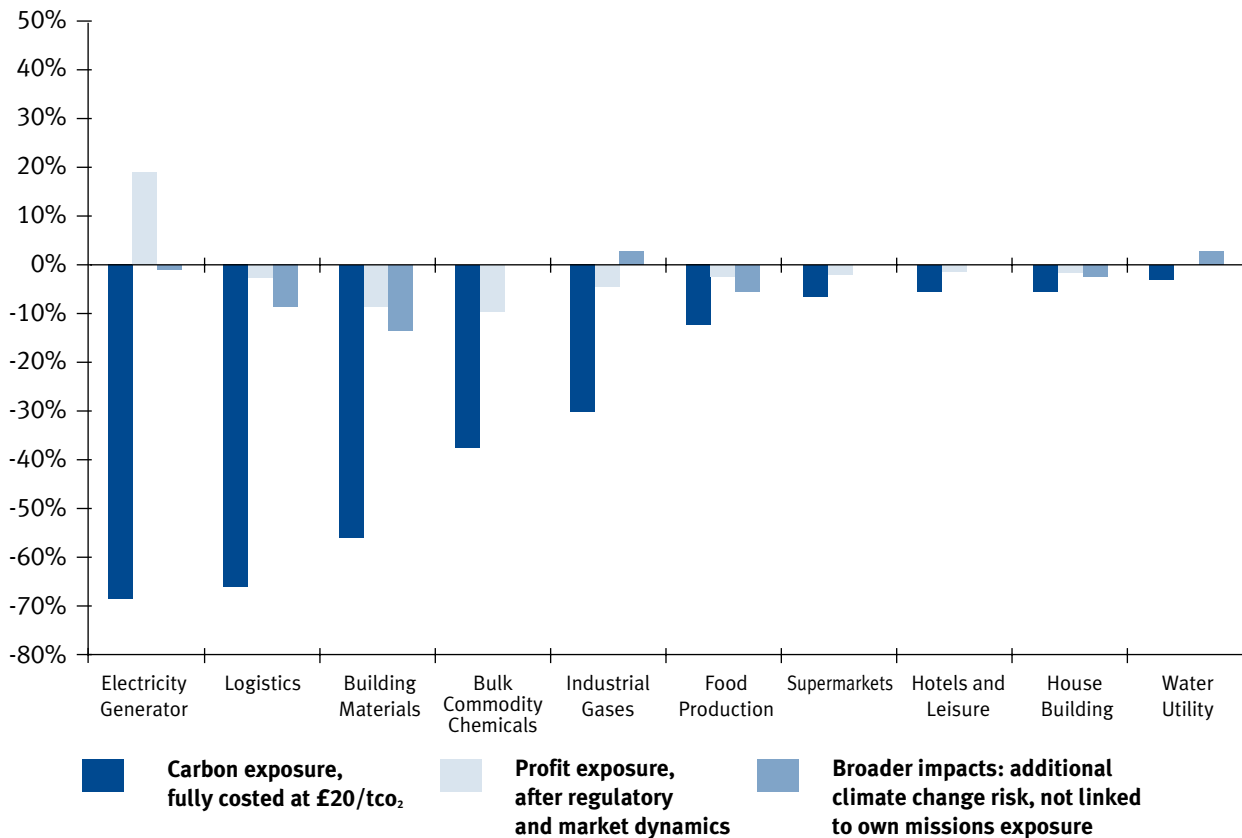
Notwithstanding this macro effect, within the equity sector, climate change will affect different sectors, countries and companies to varying extents. An estimate puts the global market value at risk from climate change in the range 150 - 680 billion euros (West LB, 2003). Government regulation to reduce greenhouse gas emissions may have a major impact on a number of industry sectors. The most sensitive sectors are either energy-intensive (e.g. cement, aviation, metals) or energy industries (e.g. oil and gas, coal, power utilities); or provide energy-intensive products (e.g. automobiles).

There are systematic differences in the present value of corporate earnings, across a range of possible future climate policy scenarios. This means that management and investors cannot assume that there will be time to react to policy when it is approaching implementation, because there are structural factors such as access to resources and technology, or customer mix, which may take a long time to change. Some sectors face several environmental challenges, and tackling greenhouse gas emissions may interact with some of those other problems.

Figure 2 is the result of a number of case studies looking at the impact of climate change on companies in different sectors. The direct impact of the European Union Emissions Trading Scheme (EUETS – blue bars) is adjusted (red bars), mainly because companies can pass through the costs to their customers, and interrelate with the broader impacts (orange bars). The total risk is the sum of the red and orange bars. On a sectoral level, only building materials and bulk commodity chemicals have potential value at risk of 10% of EBIT⁷ by 2013 (Carbon Trust (2006)). However, if the price of carbon is higher than the assumed £20 per tonne of carbon dioxide, the effect on earnings will be much greater (although there will be some winners too).

Figure 2: Value at risk from climate change⁸

Potential impact in 2013 as % of EBIT, based on 2004 operating statistics



⁷ EBIT: earnings before interest and tax

⁸ Carbon Trust (2006)

Note: In order to provide a like-for-like comparison, the value at risk analysis above is shown before the EU/Non-EU adjustments, i.e. it compares a 100% EU based supermarkets, versus a 100% EU based hotel and leisure group.

Climate change will have an asymmetric impact on individual companies in the same sector as well as its impact on the sector as a whole. For example, a study of the effect of climate policy generally on the global automobile industry (Austin et al, 2003), concluded that the effect of carbon constraints on the corporate earnings of individual companies ranged from an increase of 9 per cent to a decline of 10 per cent, reflecting factors such as the cost to match potential emissions controls on vehicles and the manufacturer's customer mix. For example, the Japanese car manufacturer Toyota which has a strong R&D programme on carbon-light technologies has a distinct advantage over its competitors. Another example of corporate differentiation is that in 2005, 30% of vehicles manufactured by Honda already met the new EU emissions standards (due to take force in 2008), but none of BMW's models did (Sauer et al, 2005). A study on the effect that corporate positioning to climate change might have on consumers (Carbon Trust, 2005) concluded that surprisingly large market values are at risk in sectors that are not obviously exposed, such as food and drink (£6.6 billion for UK quoted companies) and banking (£5.7 billion). Another study estimates that the EU could impose a penalty of €21/gCO₂/km for car emissions, which would "come as a terrible blow for auto manufacturers across all segments" (Michells et al, 2007).

The 2005 US hurricane season provided an example of how climate change can have large, uncertain and unknowable effects on equity value. Hurricane Katrina damaged 20 oil rigs and 8 oil refineries. This caused a spike in oil prices to \$71 a barrel, increasing the value of energy companies, but having a negative impact on other shares (the Dow Jones was down 12 points on that day). (Edwards, 2005). Then, Hurricane Rita caused oil prices to fall, and hence energy shares to fall, as demand for crude was reduced by the shutdown of refineries (Hoyos et al, 2005). Another peak in oil prices followed, reflecting the widespread damage to the oil-producing installations in the Gulf, and speculative activity. Meanwhile, insurance losses from Katrina alone are estimated to be \$60 billion, concentrated on reinsurance companies, with a negative impact on these companies' share values (Davidson (2006)). The impact of Katrina was therefore negative on the equity prices of many insurance companies, but positive on oil companies due to the rise in oil prices, even though they suffered direct physical damage.

Probably a key feature in companies' ability to adapt to climate change is the quality of their management. The firms that are likely to prosper will tend to be those that recognise the importance and impact of climate change on their business; foresee and anticipate the implications for their industry (Llewelyn, 2007).

16.4 Other investment classes

A minority of pension fund and life companies assets are invested in other assets, the most significant being property. Like equity, the property sector could suffer from both direct and indirect impacts. Direct impacts include the increased probability of acute events such as storms, sea surges and flooding, as well as long-term impacts such as subsidence, sea level rises or lack of availability of water. Property can also be affected by indirect impacts, for example, legislation on carbon emissions from buildings or maximum legal temperature for work, and there could be significant retrofitting costs. There is also much new and anticipated regulation in the property sector with respect to climate change adaptation and regulation which could lower property returns.

Increasingly popular alternative investments are vehicles such as hedge funds or private equity. Many of these share similar characteristics with equities. Climate change has created a new source of alternative investments, with the launch of a number of alternative energy and clean tech funds – in 2007, 15.2 per cent of net inflows into European equity funds went into ecological or environmental funds specialising in areas such as alternative energy (Johnson, 2007).

16.5 Implications for practitioners

It is standard practice to monitor investment performance over short time periods, for example, annually or even quarterly, even when liabilities are long term (Rappaport, 2005). The result is that fund managers concentrate on short-term performance to retain existing business and attract new investments. This feeds back to companies and directors who are encouraged to boost short-term performance.

Why does this happen? Firstly there is a monitoring difficulty – it is much easier to measure short-term performance. The second is that, in theory, the true value of a company is reflected in its market price. (Watson Wyatt, 2003). However, due to the high uncertainty over medium to long-term events, and the relatively high discounting factors used to equate values

over time, short-term performance factors dominate. The result is that long-term value drivers can be overlooked as they have little impact on short-term earnings. For example, if oil and gas prices increase, an oil company will be faced with a choice between developing ways of extracting more oil from marginal sources or developing alternative energy sources. The former would be likely to have a quicker pay-off than the latter. Finally there is a large amount of “churning” within the industry – managers only hold companies for a relatively short time. Therefore long-term performance is achieved through an accumulation of short-term decisions.

Short-termism has been challenged by a new generation of “responsible” investors. These have evolved out of Socially Responsible Investment (SRI), which has been around for a long time. SRI is the practice of not investing in “bad” companies – for example, arms manufacturers or companies with poor human rights records. Compared to the market as a whole, SRI is small but growing. Traditionally, SRI has been marginal for insurance companies. The UN has launched the PRI (Principles of Responsible Investment), which are summarised in Table 2.

Table 2: UN Principles for responsible investment

Principle	Actions				
	Internal	External	Collaboration	Investee Company	R&D Training
1. Integrate ESG issues into analysis and decision-making	<ul style="list-style-type: none"> • Make a statement • Assess capabilities 	<ul style="list-style-type: none"> • Insist suppliers use it • Assess fund managers 	<ul style="list-style-type: none"> • Advocate training 		<ul style="list-style-type: none"> • Support new tools • Encourage academia
2. Incorporate ESG issues into ownership policies and practices	<ul style="list-style-type: none"> • Develop policy • Get capabilities • Monitor 	<ul style="list-style-type: none"> • If outsourced, monitor 	<ul style="list-style-type: none"> • Develop policy, standards, etc • Joint engagement 	<ul style="list-style-type: none"> • Engage • Vote at AGMs • File resolutions 	
3. Seek disclosure on ESG issues by investees			<ul style="list-style-type: none"> • Support initiatives 	<ul style="list-style-type: none"> • Seek specific reports • Expand formal accounts • Encourage CSR 	
4. Promote the PRI in the investment industry		<ul style="list-style-type: none"> • Include PRI in RFPs, mandates, performance reports, etc. • Use ESG as a factor in awarding contracts • Encourage peers 	<ul style="list-style-type: none"> • Support sympathetic regulation 		<ul style="list-style-type: none"> • Support new tools to benchmark
5. Work together to implement PRI more effectively	<ul style="list-style-type: none"> • Learn from others 		<ul style="list-style-type: none"> • Share resources • Address emerging issues • Common initiatives 		
6. Report on actions and progress	<ul style="list-style-type: none"> • Disclose practices • Disclose supplier standards • Report performance 	<ul style="list-style-type: none"> • Tell beneficiaries • Tell stakeholders 			<ul style="list-style-type: none"> • Measure the effect of PRI

The new generation of responsible investors aims to capture companies’ full value by recognising and rating “extra-financial” factors which in the long term will affect a company’s performance. These include environmental performance, human capital value and reputation (Thamotheram, 2005). Responsible investors argue that they should be remunerated on a 3 to 5 year rolling average, to encourage investing over a longer time period (Watson Wyatt, 2003). If SRI fund performance delivers clearly superior returns compared to mainstream investment, investors will re-define their fiduciary

criteria appropriately to include issues such as climate change. At the moment this argument remains unproven, although growing evidence suggests that SRI criteria at least do no harm to financial performance (ABI, 2001; ABI, February 2004).

Regarding climate change, a key “extra-financial” variable is the value of carbon as an asset/liability due to policy and regulation. Currently it only has a real value in EU, of around 20 euros per tonne on the Emissions Trading Scheme marketplace. However, analysis suggests that the true “social cost” of carbon is in the region of 100 euros per tonne due to the economic and environmental damage caused by climatic changes brought about by greenhouse gas emissions. (Dlugolecki and Lafeld, 2005). It is unlikely that the market value will reach that level in the near future, so there remains a significant “extra-financial” aspect to global warming. Some commentators believe that corporate attitude to climate change serves as a proxy for quality of management, in that the issue is important but uncertain (Carbon Disclosure Project, 2004).

Way forward for practitioners

I hope that the above has convinced the reader that ignoring climate change is no longer an option for an investor – so what realistic options can the investment practitioner pursue? These fall into two categories – passive and active. The passive option basically involves a better understanding and monitoring of climate change criteria. An active role would be either to try to actively influence the investments that the insurer holds – the corporate governance approach – or to invest in “climate friendly” assets – the SRI approach.

The three approaches – passive monitoring, active engagement and active “climate” investment – all have inherent advantages and disadvantages. Passive monitoring will have limited impact if the information is not used, investors may only have limited impact on companies’ decisions, and even if you do not invest in a climate “unfriendly” company, someone else will. Also, given the size of insurers’ assets, there is not enough liquidity in “green” funds to absorb all of the sector’s assets.

Part of the problem can be addressed by tackling short-termism in the investment decision making process. This could be partly achieved by looking at the investment mandate and reward structure, for example, deferred bonuses contingent on extended performance would encourage “long-termism”.

To better understand and monitoring of climate change criteria, there is already a body of knowledge as investors are increasingly becoming interested in how climate change might affect their assets and have created various investor initiatives; some of the most important are described below:

1. The Carbon Disclosure Project (CDP): this is a coalition of 284 institutions globally, representing in excess of \$41 trillion globally, seeking to inform investors about the risks and opportunities presented by climate change. To do so it writes annually to the largest companies in the world, requesting information about carbon emissions and climate risk (Carbon Disclosure Project, 2007).
2. The Global Reporting Initiative (GRI): this is a non-profit organisation which aims to make sustainable reporting by companies as routine as financial reporting (Sullivan, 2006).
3. The Climate Risk Disclosure Initiative (CRDI): this was launched at the 2005 Institutional Summit on Climate Risk in 2005, and aims to develop a reporting standard to help improve corporate disclosure worldwide to help investors make better informed investment decisions.
4. Institutional Investor Group on Climate Change (IIGCC): this is a forum for collaboration between pension funds and other institutional investors on issues related to climate change. They seek to promote better understanding of the implications of climate change amongst their members and other institutional investors and encourage companies and markets in which IIGCC members invest to address any material risks and opportunities to their businesses associated with climate change and a shift to a lower carbon economy⁹.
5. United Nations Environment Programme Finance Initiative (UNEPFI): UNEP FI is a global partnership between UNEP and the financial sector. Over 160 institutions including banks, insurers and fund managers, work with UNEP to understand the impacts of environmental and social considerations on financial performance¹⁰.

The CDP provides detailed information on a company basis, the latest iteration – CDP5 – was answered by over 1,300 of the world’s largest companies¹¹. The other organisations provide information of a more general and analytic nature, which can help inform the practitioner of the implications of this information. The findings of CDP5 are summarised in Box 1.

However, whilst this information is a good starting point, it is probably not as yet adequate to make accurate investment decisions; company information is often of variable quality, not comparable and historical rather than forward looking. There is

⁹ www.iigcc.org

¹⁰ www.unepfi.org

¹¹ Including the FT500, S&P500, FTSE350 – see www.cdproject.net

therefore no substitute for actual engagement with an investee company, both to gain relevant information for investment decision making, and to demonstrate that the investor considers climate change as important to their investment decision (Sullivan, 2006).

A recent development has been the development of climate change indices by a number of firms, such as HSBC, which aim to track and reflect the stock market performance of companies that might be best-placed to profit from the challenges of climate change.

These include companies involved in reducing emissions, managing the effects of climate change; and adapting to the impact of climate change (Lima et al, 2007).

Once in receipt of this information, the practitioner needs to develop tools to analyse the impact of climate risk on the portfolio. Fortunately existing techniques can be applied. For example, traditional discounted cashflow valuations can either be adjusted by modelling climate scenarios and explicitly adjusting future cashflows, or by adjusting discount rates to allow for climate risk.

In addition insurance practitioners should consider how climate events that impact on claims might also impact assets, which could produce liquidity problems for companies. (Kriedler and Wagner, 2006).

Even the “passive” option of acquiring information involves engagement with companies and hence leads onto a more positive active role. A recent study (The Carbon Trust, 2005a) sets out guidelines for behaving as an active owner with regards to climate change. This would involve:

1. Develop proxy voting guidelines which reflect an active approach towards addressing climate change and related risks. Consider optimal ways to implement its proxy voting guidelines (via fund managers, or external proxy voting services). Participate in voting decisions and/or monitor that votes are effectively cast per your approach. Publish your voting record.
2. Participate in shareholder engagement activities: This could be directly with companies as an individual shareholder; In conjunction with other shareholders (e.g., via IIGCC or INCR); or Indirectly as a signatory to multi-party initiatives (e.g., the Carbon Disclosure Project).
3. Encourage engagement: This could be undertaken internally or outsourced to a third party provider.
4. Participate in the public policy debate
5. Encourage the sell-side: Allocate a proportion of your broker commissions to encourage better research on climate change¹².

The alternative to the corporate governance approach of engagement is the SRI approach of investing in “climate friendly” companies. Climate responsive funds provide not only a good hedge for climate risk, but huge opportunities for substantial investment returns “the largest opportunity of the 21st century”¹³ – resulting in potential win-win-win situations for insurance companies of matching claims, providing high returns and investing “ethically”.

Insurers have started to launch funds with climate criteria in their allocation decisions. Examples include the “Gerling Select 21” fund¹⁹¹, the Storebrand Principle Global Fund. AIG has launched a “green fund” in the Hong Kong Mandatory Provident Fund Market and AIG’s Japanese SRI equity fund includes environmental selection criteria (Kriedler and Wagner, 2006). Alternative investments are coming into vogue to get higher returns, for example, clean tech, carbon funds, and catastrophe bonds.

BOX 1: Summary of results from CDP5 (Carbon Disclosure project (2007))

The primary risks posed by climate change are:

- Physical risks
- Regulatory risks
- Competitive risks
- Reputational risks

Disclosure trends

- CDP5 generated a 77% response rate
- High impact sectors and European companies had highest responses
- Quality of responses are improving
- Issue is driven by factors other than regulation, but action trails awareness

Financial implications

- Regulation creates winners and losers
- GHG reduction less costly than expected

Emission trends

- 76% of responding companies implement a GHG reduction programme
- Emissions intensity varies within and among sectors
- Total emissions reported were 6,977 million tonnes CO₂ equivalent
- Correlation between emissions-intense regions and regulatory trends

¹² An initiative called the Enhanced Analytics Initiative pays broker commission for long-term research, however, it focuses on a number of issues as well as climate change

¹³ John Doerr (Kriedler and Wagner (2006))

Recommendation

The best strategy will be a combination of the three approaches. Increased knowledge of climate risk on a portfolio will lead to better investment decisions. Active engagement with companies can reduce risk and increase opportunities. Investing in “climate” funds may reduce risk of not meeting liabilities and could increase returns.

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Biography

Nick Silver

Chief Actuary to Parhelion Underwriting Limited, a company that develops and implements innovative insurance and structured risk transfer products specifically for the carbon market. He is Chairman of the Environmental Research Group of the UK actuarial profession and a representative of the Carbon Disclosure Project. Nick is a senior honorary visiting fellow at Cass Business School and a fellow of the Institute of Economic Affairs. He is part of the London Climate Change Partnership and the Climate Change Working Party at Lloyd's. Nick has advised the UK's Environment Department (DEFRA) and Development Department (DFID), and the German Development Department (GTZ) on risk transfer solutions for adaptation in developing countries, and has presented at UNFCCC and G8 Gleneagles dialogue conferences on the subject. He is currently working on a report for the Chartered Insurance Institute on the impact of climate change on the insurance industry, and has spoken and written widely on this topic. Nick has advised a number of African and transition economy countries on social security reform. He has also written a number of papers and articles on complexity economics and implications for the carbon market. Nick has a Masters in Public Financial Policy from the London School of Economics. Previously Nick worked as an actuary at PriceWaterhouseCoopers and Punter Southall.