An investment perspective on climate change

Climate change will be one of the biggest investment themes for the foreseeable future, writes **Alan Brown**, Group Chief Investment Officer, Schroders

On a daily basis we are bombarded with news on climate change. While a few sceptics remain, it is now accepted by the majority that we are experiencing global warming and human activity is, at the very least, a contributing factor. Many regard it as the single most serious issue facing the human race, with the potential to cause widespread suffering and economic damage affecting billions of people. Yet the implications for institutional investors and, more importantly, their clients, have had relatively little serious coverage. Simply put, climate change will be one of the biggest investment themes for the foreseeable future.

While many of the potential effects are undeniably negative, climate change also presents significant opportunities. Almost every company, whether directly connected to climate change or not, has the potential to be affected.

The Stern Review, published in 2006 for the UK government, represents the most comprehensive assessment of the economics of climate change. It assessed the scientific evidence on the causes and likely future paths of climate change. The stock of greenhouse gases (carbon dioxide, methane, nitrous oxides and others) at 430 parts per million (ppm) is up over 50% from pre-industrial revolution levels. There are long lags in the system, but this increase has already caused an estimated 0.5°C temperature increase with another 0.5°C already "baked in the cake". If emissions stay where they are today, further increases in greenhouse gases will take us to double pre-industrial levels. Of course, emissions won't stay where they are. Fast-growing economies such as China and India have rapidly growing energy and transportation needs. According to Stern, the level of 550ppm could be reached as early as 2035 with a high probability that that will cause global average temperatures to rise by 2°C.

Under a do-nothing, "business-as-usual" scenario, Stern believes that "the stock of greenhouse gases could more than treble by the end of the century, giving at least a 50% risk of exceeding 5°C global average temperature change during the following decades." It seems highly likely that if this were to occur there would be wide scale disruption to economic and social activity; extreme weather conditions, crop failures and large scale disruption to water.

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The impact of climate change, while severe for everyone, could be profound for the developing world, which is already in warmer parts of the planet and experiences highly variable rainfall patterns. Developing countries are much more dependent on agriculture and their low levels of income give them few resources to help them adapt.

A rise in sea levels of up to one metre from melting ice caps and glaciers will threaten many low-lying countries and large coastal cities including London, New York, Tokyo, Shanghai and Hong Kong.

On the other hand, at least in the initial stages of climate change, some parts of the Northern hemisphere in the higher latitudes may see some benefits. Agricultural yields may increase. There would be reduced winter mortality and a reduced need for heating. Tourism might also benefit. The impact of climate change will fall very unevenly across the planet.

Economic impact

Early estimates centred around a permanent loss of 0–3% of world output if temperatures rise by 2 to 3°C. Clearly there are huge uncertainties in these forecasts. That said, if temperatures rise by 5°C or more under a "business-as-usual" scenario, today's models suggest that global output could decline by 5–10%. It is easy to question these estimates on the grounds that we have no experience of modelling over time horizons of a century or more, and where we are dealing with completely uncharted territory. However, we need to remember that while these estimates could be wrong, they could just as easily be under-, rather than over-estimates. In that case, outcomes could be truly catastrophic.

North America and Europe account for some 70% of all carbon dioxide emissions from energy production, with developing countries accounting for less than 25%. Growth in future emissions will come mainly from the developing world, reflecting its faster population and GDP growth, and increasing involvement in energy-intensive industries.

This raises the question as to whether, if we are to combat climate change, we have to give up aspirations for future economic growth. Clearly to stabilise the level of greenhouse gases in the atmosphere we have to reduce emissions to a level equal to the planet's capacity to eliminate them. Stern estimates this will require a reduction in emissions of more than 80% from current levels! At the same time, he argues that changes in energy technologies and the structure of our economies are feasible. To stabilise greenhouse gases at 550ppm requires global emissions to peak in the next

10–20 years and then decline by 1–3% a year. To stabilise at 450ppm requires emissions to peak in the next 10 years and then decline by more than 5% a year. None of this can be achieved cost free. Stern estimates that to achieve this will cost around 1% of GDP by 2050. Set against the alternative costs from climate change under a business-as-usual scenario, 1% of GDP suddenly seems very reasonable indeed! What is clear is that the longer we wait to tackle climate change, the more costs will ultimately escalate.Already the opportunity to stabilise greenhouse gases at 450ppm is slipping out of our hands.

Climate change brings opportunities as well as challenges. To reduce the level of greenhouse gases, there are four fundamental things we can do:

- Reduce demand for emission-intensive goods and services
- Become more efficient in our use of energy
- Reduce, eliminate or reverse the damage we are doing to the planet's ability to extract greenhouse gases from the atmosphere through deforestation
- Employ less carbon-intensive technologies

It is increasingly clear that climate change is going to have a real financial impact.Every existing business produces some form of waste pollution. For those who 'pollute' beyond prescribed levels there is the risk of incurring penalties, which will affect their bottom line. Opportunities will open up for companies that can manage their emissions or those in emerging sectors such as renewable energy and desalinisation.

From an investment perspective, this provides pointers to the areas of the economy which might be affected as the world starts to address climate change seriously. Investing in these companies on the basis of how they manage environmental factors will become more of a mainstream investment strategy.

The eco-efficiency puzzle

The concept of eco-efficiency has evolved thinking on the relationship between environmental factors in stock selection and investment return. Eco-efficiency is the economic value a company creates relative to the waste it generates. The idea is that companies that rise to the challenge of climate change tend to deliver superior profitability.

A company's coefficient of eco-efficiency is its ability to manage downside risk as well as identify and capture upside opportunities for additional profit and competitive advantage. A high eco-efficiency is thought to be indicative of good management, as those at the helm may be able to respond quickly and effectively to unknowns in the market.

Since 1996, Innovest has developed ratings on companies based on eco-efficiency. The ranking system, known as Eco Value21 provides industry-relative rankings that aim to provide environmental and return differentiation. On a relative basis, the stocks of higher-ranked companies purportedly will deliver higher investment returns than lower ranked counterparts within industry groups. Innovest argues that by carefully analysing and quantifying how companies handle the challenge of environmental change, the ranking captures significant information not utilised by most investors in determining the price at which stocks trade.

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Using this information as a basis, a study published by Gluck and Becker[1] found that ecologically enhanced versions of a number of investment strategies were superior to sampled baseline strategies which did not account or screen for environmental factors. A further study by Jeroen Derwall *et al*[2] used Innovest ratings to investigate whether a long run premium or penalty exists for holding environmentally responsible companies. The study showed that a portfolio comprising stocks of companies ranked high for eco-efficiency outperforms lower-ranked counterparts after adjusting returns for market risk, investment style and industry effects. As such, they concluded that the benefits of considering environmental criteria in the investment process could be substantial. They considered this puzzling as it is difficult to reconcile the observed performance differential with the well established risk/return paradigm. The fact that common risk factors fail to account fully for the observed results raises the possibility of a mis-pricing story.

Alternatively, results may be period specific. Longer-run studies may reveal that returns are indistinguishable between environmentally responsible companies and the broader market. It would not be surprising if, as the market becomes more sensitive to the environmental impact on companies, the "environmental factor" becomes fully discounted to the point where *ex-ante* returns were the same.

Asset pricing theories

Another argument commonly raised as to why investments based on environmental criteria may hurt performance is asset pricing theory: that in an efficient market investment portfolios deliver returns proportional to the associated risk. Consequently, the optimal investment portfolio is a well diversified one. In this model, any empirical evidence of anomalous risk-adjusted investment performance on the part of stocks grouped by company-specific characteristics, such as size or corporate social responsibility, are attributable to deficiencies in the performance evaluation models that attempt to explain them. After the methodological shortcomings are corrected, no abnormal returns should exist. This is akin to proving that the bumble bee can't fly even though it clearly can!

This theory would suggest that socially responsible investors will suffer from imposed limits to diversification

1 Gluck, K, and Becker, Y, *Journal of Asset Management*, Vol 5, no 4, pp 220–222.

2 Derwall, J, Guenster, N, Bauer, R, and Koedijk, K, 'The Eco-Efficiency Premium Puzzle', *Financial Analysts Journal*, Vol 61, no 2, 2005, pp 51–63.

when an appropriate attribution framework is used. However, in line with other studies, we consider that corporate social responsibility, particularly environmental factors, reflects the company management's views on how the company will perform in the long term. As such, they may be mis-priced because of the shorter time frames utilised within the financial community. Over longer time horizons, environmental factors may be incrementally profitable.

The Capital Asset Pricing Model (CAPM)[3] is a partial equilibrium model. While it has stood the test of time well, it is widely recognised that it represents an abstraction of reality. Two respected academics, Fama and French, argued in a seminal paper[4] for an extension of CAPM to include two other factors: size and value. Arguing that there could be a premium attached to environmental responsibility is in principle no different to arguing that small size and value can have positive return attributes.

Still unconvinced?

It may be useful to consider some of the evidence indicating that environmental factors are not harmful to investment. In their 2000 study[5], Waddock and Graves found that socially responsible companies perform about the same financially and investment wise. In 1998 Gottsman and Kessler[6] reported that their analysis of both stocks on the S&P 500 and environmentally screened stocks showed that there was "no significant effect, positive or negative, on returns or risk adjusted returns".

As successful investment depends on a vibrant economy built on a healthy civil society and a sustainable planet, there is a long-term self-interest for investors to look at the management of environmental factors by all types of companies. A better inclusion of environmental considerations in investment decisions could ultimately contribute to more stable and predictable markets. To date, many have only considered environmental factors in relation to investing when they pose a risk to value creation. Over time, it may become part of the fiduciary responsibility of institutional investors to look at the risks and rewards of environmental considerations in investing.

Investment rational for a more rigorous inclusion of environmental criteria in financial analysis rests on the business case at the level of the company. Several recent studies of companies and industries have contributed to a better understanding of the value drivers through which good management of environmental issues contributes to shareholder value creation. Many studies confirm that the way a company manages environmental issues is often a good indicator of overall risk levels and general management quality – both strong determinants of a company's long-term success.

Even if you don't want to accept this premise, it may be better to treat this as a trend-watching activity. For example, it is difficult to ignore the rapid growth of the market for hybrid cars in recent years – last year alone, the market grew about 30%. As an asset manager, we should look to the individual stocks which are doing well within this and consider how we place them in a portfolio. Moreover, environmental issues can have a strong impact on reputation and brand, an increasingly important part of company value.

From a fiduciary perspective, our responsibility to look at environmental considerations could be deemed to extend beyond providing investors with the best risk adjusted returns from looking at market trends and emerging sectors. As a global asset manager, we are signifcant shareholders in many of the world's leading companies. Consequently, it may be argued that we have a governance responsibility to enquire of those companies what they are doing to contain their carbon footprint as well as other environmental considerations.

From theory to practice

Having laid down the rationale for including environmental factors in investing, how we should best do this in practice? We see the potential for two complementary approaches.

Using fundamental research, we believe it is possible to identify companies which either mitigate or help us adapt to the effects of climate change. As a result, earlier this year we launched the Schroders Climate Change Fund.

Using the eco-efficiency principle, these companies have in some way identified the changes in the global economy as a result of climate change and are responding accordingly.

The fund enables us to invest in companies which adapt to climate change absolutely and relatively. Consider a company that operates in such environmentally sensitive industries as mining, energy or chemicals. In absolute terms these companies are labelled as poor environmental performers. On the eco-efficiency performance measure, however, these companies can still do well relative to their competitors facing the same environmental challenges. Such companies could be included in a portfolio alongside those that more obviously mitigate the effects of environmental changes, such as a hybrid vehicle manufacturer or a clean energy company.

The fund is benchmark-unconstrained and has a global mandate. It is a thematic, environmentally aware fund but more mainstream than ethical funds.

A second type of fund could be developed using the Innovest ratings directly. Here the full market opportunity set would remain eligible for investment, but higher-ranked environmentally responsible companies would be favoured, and lower-ranked penalised. While the portfolio would be biased towards more responsible companies, environmental

3 Sharpe, W, 'Capital Asset Prices – A Theory of Market Equilibrium Under Conditions of Risk', *Journal of Finance*, Vol 19, no 3, September 1964, pp 425–442.

4 Fama, E, and French, K, 'The cross-section of expected stock returns', *Journal of Finance*, Vol 47, no 2, June 1992, pp 427–465

4 Waddock, S, and Graves, B, *Journal of Investing*, Summer 2000, pp27–38.

5 Gottsman, L, and Kessler, J, 'Smart Screened Investments: Environmentally Screened Equity Funds that Perform like Conventional Funds', *Journal of Investing*, Fall 1998, pp 15–24.

laggards, if cheap enough, would still be bought, and responsible companies, if too expensive, would be avoided.

Such a fund would be able to address concerns from trustees aware of their fiduciary duty to maximise returns but also increasingly sensitive to climate change and environmental factors

There is now a wealth of evidence that climate change is a reality with wide ranging financial implications. Asset managers need to consider how we can incorporate environmental considerations into our investment processes. To do anything else would be to neglect our fiduciary duty to our clients.

For further information, please contact . . . . . .

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