The Commonwealth

Natural Resource Insights

A Special Focus on Capital Market Policies and the Paris Agreement | 2022/01

Capital Market Policies to Achieve the Paris Agreement

The world is not currently on course to limit global warming to 1.5 degrees Celsius. Carbon dioxide emissions are increasing,[1] emissions targets in countries' Nationally Determined Contributions are not ambitious enough,[2] and oil and natural gas production are expected to increase given current policies.[3] A lack of investment[4] in the low-carbon economic transition partly explains this limited progress towards the Paris Agreement's goals.[5]

Market imperfections explain this underinvestment in the low-carbon economic transition. Climate change[6] is a tragedy of the horizons, as many of the costs of climate change are incurred in the future beyond the business cycle, the political cycle and the horizons of most investors, while in contrast the costs of limiting climate are borne in the short and medium term. Thus, sovereigns and markets may overinvest in carbon-intensive industries and underinvest in the low-carbon economic transition.

A tragedy of the commons may also result in overinvestment in carbon-intensive industries. Individuals capture the profits generated by carbon-intensive industries, but the costs of emissions are borne by humankind. Likewise, low-carbon economic transition projects generate benefits in terms of the emissions foregone, but this does not result in a direct monetary benefit for the investor. These external costs and benefits will lead to the market overinvesting in carbon-intensive industries and underinvesting in the low-carbon economic transition in the absence of corrective public policies.

Limited reporting and information on emissions may also contribute to financial flows being inconsistent with the goals of the Paris Agreement. Environmental, social and governance funds are growing and, in many cases, wish to make investments that are consistent with limiting climate change to 1.5 degrees Celsius.[7] However, these funds are hampered in making such investment decisions by a lack of information on the current and likely future carbon emissions of different investments, albeit initiatives such as the Task Force on Climate Related Financial Disclosures (TCFD) are increasing the information on carbon emissions available to investors.

Governments can use fiscal policies to make fossil fuels more expensive and renewable energy cheaper. Fiscal policies can do much of the heavy lifting[8] to achieve the goals of the Paris Agreement, with carbon pricing and other taxes on fossil fuels being particularly effective policies.[9] These public policies may, however, be politically difficult to implement. Policies to increase the costs of fossil fuels may be unpopular with consumers and businesses, and governments' attempts to introduce carbon pricing have not always been successful or sustainable. The Australian government, for example, implemented a carbon pricing scheme under the Clean Energy Act 2011, but this scheme was repealed in July 2014.[10] In other cases, governments have established carbon-pricing schemes, but the price placed on carbon has initially been too low to significantly reduce emissions. This is arguably the case with South Africa's carbon-pricing scheme.[11]

It is also debatable whether fiscal policies alone can achieve the Paris Agreement's goals.[12] Some market failures cannot be well addressed by fiscal policies,[13] and fiscal policies that result in higher investment in the low-carbon economic transition and lower investment in carbon-intensive industries may exacerbate transition risks, especially if they are implemented suddenly and without forewarning.[14]

Given the constraints on fiscal policy, there is also a role for capital market policies in achieving the Paris Agreement's goals. This paper examines, with a focus on the Commonwealth, the following approaches:

- public policies to leverage investment in the low-carbon economic transition;
- central bank policies and regulations to make financial flows consistent with the Paris Agreement's goals; and
- how Commonwealth SWFs can invest to achieve the Paris Agreement.

This paper focuses on these areas as they have the potential to significantly contribute to the achievement of the Paris Agreement's goals by reducing investment in carbon-intensive industries and increasing investment in the low-carbon economic transition. In addition, there has been much good work by Commonwealth member countries in these areas.

1. Public Policies to Leverage Investment in the Low-Carbon Economic Transition

Achieving the Paris Agreement requires increased investment, particularly in early-stage businesses contributing to the low-carbon economic transition.[15] Early-stage businesses in many sectors struggle to raise capital, but there is evidence that financing constraints may be especially acute[16] for those contributing to the low-carbon economic transition. Innovations to reduce or capture greenhouse gas emissions may have timescales spanning many decades and take many years before they are profitable. Such investments may be unattractive to many investors who are seeking short-term profits. In addition, early-stage businesses contributing to the low-carbon economic transition may combine the profit motive with an environmental mission, and since investors are not fully rewarded for external environmental and societal benefits, they may underinvest in such businesses.[17]

Early-stage businesses tend to rely on different sources of financing as they mature and their risk profile changes.[18] This is often referred to as the financial escalator theory, with the three initial steps on the financial escalator being: grants; business angels and venture capital; and bank debt financing.

The commitment of governments to the Paris Agreement's goals and the financing constraints faced by early-stage businesses contributing to the low-carbon economic transition provide a strong rationale for public policies to alleviate this financing constraint. This section,[19] therefore, examines the role governments can play in alleviating this financing constraint through policies to increase the provision of grants and seed financing, business angel financing and venture capital, and bank debt financing.

1.1 Grants and seed financing

The seed stage of a business start-up is often the riskiest for investors, as there is a high chance that the business will fail. There is often a lack of financial support for businesses involved in the low-carbon economic transition at this stage of the business cycle. Considering this constraint, many countries provide public sector grant financing for proof of concept, early-stage innovation, and research and development.

Innovate UK is a good example of a government grant financing programme for businesses. Its smart grants of up to £250,000 were a significant early-stage financing mechanism for proof of concept, prototyping and marketing. Nearly one in ten of these grants were for environmental and renewable energy projects. This programme is generally regarded as being successful with, between 2011 and 2015, 7,000 applications leading to £160 million of funding for 1,600 projects, and the creation of more than 3,000 jobs and over £250 million in gross valued added.[20]

1.2 Business angels and venture capital

Bank borrowing is often not available for innovative high-risk projects at the cutting edge of the low-carbon economic transition. For such projects, venture capital can provide an alternative source of financing. The Canada Nova Scotia Clean Technology Fund provides a good example of one such fund

in the Commonwealth. Between 2011 and 2017 it invested in 12 seed companies including bioscience and smart grid businesses.[21]

The impact of public sector-supported equity investment funds is often greatest when businesses can raise large-scale follow-on funding.[22] The chances of such follow-on funding are greatest when the low-carbon economic transition projects being financed are close to market and have significant commercial potential.[23] This has prompted the development of large-scale public funds that are attractive to institutional investors and which can offer both early-stage funding and scale up funding to commercialisation.

The United Kingdom Innovation Investment Fund (UKIIF) provides a good example of such a fund in the Commonwealth. It provides long-horizon investment for early-stage businesses focusing on the energy, advanced manufacturing, digital and health sectors. Its sources of financing included the UK government, European Investment Fund and private co-financing. In the six years after it was established, the UKIIF had invested in over 300 small or medium-sized enterprises globally and had leveraged private investment 20 times the value of the public sector's contribution.[24]

1.3 Bank debt financing

After the 2008 financial crisis there was a decline in conventional bank lending, and lending to early-stage businesses was particularly constrained.[25] This, when combined with the positive externalities from the low-carbon economic transition, provides a strong rationale for public sector support to green investment banks.[26] The UK's Green Investment Bank provides an example of such a bank in the Commonwealth. It was established in 2012 to draw private capital into offshore wind farms, waste-to-energy plants and energy-saving projects. It was privatised three and a half years later, partly to reduce public debt but also because the UK government had concluded that there was enough private capital in the market and that there was a risk that the bank was crowding out private sector financing,[27] which arguably demonstrates the success of public policies in developing a significant green finance market. By the time of its sale the bank had invested in 100 projects with a transaction value of £12 billion and had committed £3.4 billion of its own capital.[28] As such, it had stimulated investment in the low-carbon energy transition, particularly offshore wind.[29]

The Green Investment Bank was not, however, without its critics. It has been argued that it concentrated too heavily on large infrastructure projects and that it should have financed more early-stage businesses and technologies.[30] The National Audit Office[31] also concluded that there was insufficient evidence to determine the degree to which the Green Investment Bank had driven growth in the green economy.

In conclusion, low-carbon economic transition businesses face constraints in accessing seed financing, venture capital and bank financing at different stages of their development. This can lead to investment being below that which is socially optimal and consistent with the Paris Agreement's goals. This provides a rationale for public sector policies, such as grant schemes and green banks, to support financing of the low-carbon economic transition, and there are many examples of successful public policies in this area in the Commonwealth. Yet this does not mean that every Commonwealth country should immediately set up a green bank or a grants scheme. Rather, a reasonable way forward for many commonwealth countries would be to review each step on the financing escalator, to identify the constraints faced by low-carbon economic transition businesses in accessing financing, and to consider whether public funds can ameliorate these constraints cost effectively and leverage private sector financing.

2. Central Bank Policies and Regulations to Make Financial Flows Consistent with the Paris Agreement's Goals

Central banks[32] can develop policies and regulations in five main areas to make financial flows consistent with the Paris Agreement.[33] These policies are:

- assessing the impact of climate change and the low-carbon economic transition on the financial system;
- accounting for climate risk in financial regulations;
- encouraging carbon emissions disclosure;
- assisting financial institutions to assess the extent to which the businesses and projects they finance are contributing to climate change; and
- greening central banks' portfolios.

This paper discusses each of these policies.

2.1 Assessing the impact of climate change on the financial system

Central banks can lead the way in assessing the impact of physical, transition and liability risk[34] on the future finances of banks, insurers and pension funds. Such assessments can illustrate the potential climate change-related risks for financial institutions that have invested in businesses and other assets that may suffer losses due to climate change or the low-carbon economic transition. As such, they are powerful tools for nudging[35] the financial system to reprice the cost of capital between investments that are well placed to benefit from the low-carbon economic transition and those that are likely to lose out because of liability, physical and transition risks. There is increasing evidence that this repricing is already underway with, over a ten-year period starting in 2007–10, loan spreads falling by 24 per cent for offshore wind and increasing by 38 per cent for coal power stations.[36]

The Bank of England has led the way in assessing the impact of climate change on the financial system. It reported on the impact of climate change on the insurance[37] and banking sectors[38] in 2015 and 2018 respectively. The later report found that most banks are starting to treat climate change risks like other financial risks and not merely as a corporate social responsibility issue. These banks are also beginning to consider the impacts of the physical risks from climate change on their assets, such as the impact of increased flooding on mortgages and the impact of extreme weather events on sovereign risk. These banks have also begun to assess exposure to obvious transition risks from current government policies. For example, banks have begun to consider how possible future carbon prices might affect their investments in carbon intensive industries.

The Bank of England is further examining climate change's impact on the financial system through its 2021 Climate Biennial Exploratory Scenario.[39] This forthcoming report aims to evaluate the impact of climate change on the financial system through early transition,[40] late transition[41] and no additional policy scenarios.[42]

Other Commonwealth central banks and financial regulators are also undertaking important work assessing the impact of climate change on their financial systems. Australia, Canada and Singapore are all committed to stress testing the impacts of climate change on their financial systems. In addition, the central banks of 12 Commonwealth countries are members of the Network for Greening the Financial System, which is a group of central banks willing to share best practices and contribute to the development of climate risk management in the financial sector to mobilise finance to support the transition to a sustainable economy. This network[43] recently published climate change scenarios that Commonwealth central banks can use when examining the possible impacts of climate change on their financial systems.

2.2 Accounting for climate risk in financial regulations

Commonwealth central banks could in theory go further by amending financial regulations to account for climate change-related risks. For example, central banks could mandate lower reserve requirement ratios for banks that lend more to projects, businesses or sectors that are contributing to the low-carbon economic transition. The Banque du Liban (the Central Bank of Lebanon) has implemented such a policy by lowering the reserve requirements of commercial banks that provide significant lending to green projects. Alternatively, central banks could mandate higher

reserve requirements for banks that were providing substantial lending to carbon intensive businesses and projects.

There are, however, three significant risks to central banks using binding regulations to address climate change-related risks.[44] First, reducing capital requirements for banks lending to low-carbon economic transition projects could, especially if those projects are not in fact low risk, undermine the overall objective of prudential policy, which is to reduce the risk of financial instability. Second, if applied to banks' exposure to high-carbon sectors (e.g. utilities), climate-aligned prudential policy would constrain lending to those businesses within sectors that had low emissions or credible plans to reduce emissions. Third, unless all jurisdictions implement similar reforms, high-carbon businesses may simply avoid the climate-aligned prudential policy in one jurisdiction by raising finance in another. This would result in more capital being raised in those jurisdictions least concerned with climate change.

Due to these risks, few central banks have used binding financial regulations to address climate change-related risk. And arguably more work needs to be undertaken to understand both the impact of climate change on financial stability[45] and the impact of prudential regulation on the financing of the low-carbon economic transition before Commonwealth central banks consider implementing such regulations.

2.3 Encouraging carbon emissions disclosure

Investors' limited understanding of their exposure to climate-related financial risk also impedes the low-carbon economic transition. If investors understood how the businesses and projects they held were exposed to climate change-related risk, they would arguably shift capital away from these high-risk investments and towards the low-carbon economic transition. There has, thus, been a sustained effort to support disclosure of climate-related risk by the private sector.

The work of the TCFD[46] has been key in encouraging the private sector to disclose climate-related risk. It has developed a single accessible framework for climate change-related financial disclosures, with recommendations structured around governance, metrics and targets, strategy and risk management.

Commonwealth central banks and financial regulators have been strong supporters of the TCFD initiative. Examples of this support include:

- The Australian Securities and Investment Commission updating its regulatory guidance in August 2019 to encourage TCFD-aligned reporting and welcoming TCFD as the preferred market standard;
- the Canadian government providing Covid-19 relief financing to larger employers that was partly dependent on their publishing TCFD aligned disclosures;
- the UK government publishing a roadmap[47] towards mandatory TCFD-aligned climate change-related financial disclosures; and
- the Bank Negara Malaysia (the central bank of Malaysia) and the Securities Commission of Malaysia establishing a Joint Committee on Climate Change which has undertaken a stocktake on the disclosure practices of financial institutions against the TCFD's recommendations. This committee is also working with businesses to contextualise the TCFD's recommendations to the Malaysian economy and financial system, and it is developing resources to improve disclosures.

The TCFD has successfully promoted climate change-related financial disclosures, although more work needs to be done. On the one hand, the TCFD is now supported by over 859 financial firms responsible for assets of approximately US$175 trillion.[48] On the other hand, only 49 UK public companies are comprehensively reporting on climate change-related financial risks,[49] and 70 per cent of a sample of the world's biggest emitters failed to disclose the effects of climate risk in their 2020 financial statements.[50] Commonwealth countries could thus consider how they could further encourage uptake of TCFD-compliant reporting; with one option being for those countries with larger capital markets to consider a pathway towards mandatory disclosure.

2.4 Assisting financial institutions to assess the extent to which the companies and projects they finance are contributing to climate change

Central banks also have a role to play in assisting financial institutions to better understand the extent to which the businesses and projects they are investing in are contributing to the Paris Agreement's goals. The Bank Negara of Malaysia (central bank of Malaysia) has undertaken important work in this area. More specifically, it has recently introduced a principle-based taxonomy[51] to assist financial institutions in assessing and categorising the businesses and projects they invest in according to the extent to which they contribute to climate change and the low-carbon economic transition.

This taxonomy uses five broad principles (climate change mitigation, climate change adaptation, no significant harm to the environment, remedial measures to transition and prohibited activities) to place businesses and projects into three broad classification themes (climate supporting, transitioning and watchlist). Box 1[52] further describes these classification themes and the different actions financial institutions should undertake depending on whether a company or project falls into the climate-supporting, transitioning or watchlist theme.

2.5 Greening central banks' portfolios

Central banks are also beginning to consider how they can green their investments. The reference interest rate was, traditionally, the main tool used by central banks to operate monetary policy, but since the 2008 financial crisis there have been significant quantitative easing programmes. Under these programmes central banks have stimulated their economies by buying government and corporate bonds, which has also led to some central banks becoming significant investors in corporate debt.

Most quantitative easing corporate debt programmes aim to be market neutral. In practice, this means that central banks' purchases are allocated across sectors of the economy according to the amount of eligible debt that is outstanding in each sector.[53] This approach results in central banks investing in large carbon-intensive companies, as such companies are significant issuers of investment grade corporate debt, while in contrast low-carbon transition companies may be too small to issue corporate bonds. Central banks purchasing significant amounts of carbon-intensive debt may signal to the market that those securities are liquid and low risk and, thus, have the unintended consequence of furthering carbon lock-in for the economic system. It also seems somewhat paradoxical that central banks are highlighting the financial risks of climate change while also investing in carbon-intensive companies.

It has, thus, been suggested that central banks green their quantitative easing programmes.[54] This could involve excluding corporate bonds from carbon-intensive companies and favouring bonds from low-carbon projects in quantitative-easing programmes. Or, alternatively, central banks could continue with market-neutral quantitative-easing programmes and run an additional asset purchase scheme for low-carbon financial assets only.

The greening of quantitative easing programmes is, however, a controversial policy[55]. Quantitative easing was intended to be a cyclical policy instrument aimed at providing temporary stimulus to the economy, and using quantitative easing to engineer a low-carbon structural change may not be entirely consistent with that objective. Expanding quantitative-easing programmes beyond investment-grade corporate debt to the financing of riskier low-carbon transition projects may also lower the quality of the portfolio, especially if central banks lack the expertise to evaluate the relative credit risk of different green projects and technologies.

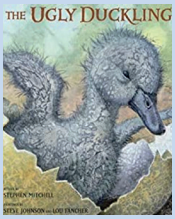
Despite these controversies, there have been careful steps by Commonwealth central banks to green their asset purchases. The Bank of England, for example, has recently published a discussion paper outlining options for greening its corporate bond purchase scheme.[56] Interestingly, the Bank of England rejected the policy of divesting from high-emission bonds and buying low-emission bonds for two reasons.[57] First, high-emission bonds are issued by companies that arguably need to be persuaded to embark on policies to reduce their emissions, and selling these bonds risks them being purchased by investors with a low commitment to the Paris Agreement. Second, simply selling high-emission bonds penalises those companies that have high emissions but also a credible plan to reduce such emissions. Thus, instead of indiscriminate portfolio decarbonisation, the Bank of England's proposed strategy includes: incentivising companies to take decisive action to achieve net zero; leading by example and learning from others; and ratcheting up investments over time. It intends

Box 1: Bank Negara of Malaysia: the climate change principle-based taxonomy and its implications to financial institutions

Supporting

- The supporting theme includes only those businesses and projects that are contributing to climate objectives and are not causing significant harm to the environment.
- Financial institutions should support businesses and projects to meet the supporting theme and may provide financial incentives to their customers to meet this theme.

Transitioning



- This theme includes those businesses and projects that are transitioning to low-carbon activities but that are also still harming the environment in the short-term.
- Financial institutions should recognise companies and projects efforts to transition to low-carbon activities. They should also encourage companies to remediate harmful environmental practices and encourage and monitor their transition .

Watching

- The watching theme includes companies and projects that are not committed to remediating the harm caused by their activities and are not attempting to transition to more sustainable business practices.
- Financial institutions should constructively engage customers in the watching theme and assist them develop concrete plans to address environmental harm. In the event that customers continue to lack commitment to remediate the environmental harm caused by their activities then financial institutions can consider lending to them on less favourable terms.

to operationalise this strategy through targets, eligibility, tilting and escalation (further details are provided in Box 2).

This section discussed central bank policies to make financial flows consistent with the Paris Agreement. Two important, and relatively uncontroversial, policies that central banks can pursue are encouraging climate change-related financial disclosures by companies and assessing the impact of climate change-related financial risk. Commonwealth countries with significant capital markets should consider further action in these areas.

3. How Commonwealth SWFs Can Invest to Achieve the Paris Agreement[58]

SWFs are government-owned investment funds with macroeconomic objectives. There are 25 such funds in the Commonwealth, with over US$870 billion in assets under management, and a further 15 Commonwealth countries are considering establishing such funds. SWFs could play an important role in making financial flows consistent with the Paris Agreement for three reasons.

First, the investment policies of SWFs should, as state-owned funds, arguably be aligned with their country's international commitments under the Paris Agreement. Other large investors, such as pension funds, are in contrast responsible for investing on

Box 2: Proposed tools for the green corporate bond purchase scheme

Targets

- Set path with targets for the emissions properties of the portfolio
- Explore scope for purchasing instruments that directly finance green activities

Eligibility

- Link eligibility to progress in climate disclosures
- Place tighter restrictions on involvement in activities inconsistent with net zero
- Explore linking eligibiltiy to credible transition plans

Tilting

- Rebalance bond purchases in favour of issuers with stronger climate performance
- Explore combining forwards and backwards indicators

Escalation

- Tighten requirements over time
- Introduce specific escalation strategy

behalf of individuals who are not signatories to the Paris Agreement and who may not be committed to its goals.

Second, SWFs are often able to make large, illiquid and long-term investments at scale. Such characteristics provide SWFs with a comparative advantage when investing in low-carbon economic transition projects that may be unprofitable in the short term but which may have attractive long-term returns.

Third, markets and investors often look to SWFs for leadership. Markets may consider that the relationships between SWFs and governments provide them with pertinent insights into how future changes in regulations and public policies will affect relative returns from carbon-intensive and low-carbon economic transition projects. Thus, if an SWF starts investing in low-carbon transition projects, this may leverage further investment by private sector investors who have concluded that future changes in public policies will increase the profitability of that investment.

The One Planet Sovereign Wealth Fund Framework recognises the important contribution SWFs could have in achieving the Paris Agreement's goals.[59]

This group consists of 15 leading SWFs that are committed to accelerating the integration of climate change issues into the management of large, long-term asset pools, thereby improving long-term returns. The achievement of this goal is guided by the principles of alignment (building climate change considerations into decision making), ownership (encouraging companies to address climate change in their activities) and integration (building consideration of climate change-related risks and opportunities into investment management).

The NZ Super Fund was a founding member of the One Planet Sovereign Wealth Fund group. It was established to help reduce the future tax burden of universal pensions on New Zealanders and has developed a detailed climate change strategy.[60] This strategy is underpinned by the belief that carbon risk is currently underpriced in the market, and that targeting reductions in the carbon emissions of its portfolio is thus consistent with its mandate of 'maximising return without undue risk to the fund'.

The climate strategy of the NZ Super Fund involves reducing exposure to fossil fuel companies and other companies that are also at significant risk

from climate change. It also includes analysing and incorporating climate change considerations into asset valuations, engaging as an active shareholder with companies around their climate change policies and searching for opportunities to invest in the low-carbon economic transition.

The NZ Super Fund also defines, targets and reports its carbon exposure. Compared to the benchmark portfolio, the initial targets were for a 20 per cent reduction in the actual portfolio's current carbon emissions intensity,[61] and for a 40 per cent[62] reduction in potential carbon emissions from fossil fuel reserves, by 2020. As of 30 June 2019, the NZ Super Fund's climate change strategy has led to it achieving reductions of 43 per cent and 52 per cent in carbon emissions intensity and potential emissions from fossil fuel reserves respectively.[63]

The NZ Super Fund provides a strong example of a detailed and effective climate change investment strategy. In the Commonwealth,[64] Australia's Future Fund has also developed a detailed Environmental, Social and Governance Policy which includes consideration of the impact of climate change on its investments. Singapore's Temasek Fund[65] is also undertaking important work in this area by publicly expressing support for the TCFD, by working with those companies it has invested in to enhance their climate change-related disclosures and by committing to halving the net emissions of its portfolio by 2030.

There is, however, scope for SWFs to better align their portfolios with the Paris Agreement. The majority of SWFs do not have climate change strategies, do not report the carbon emissions of their portfolios and do not consider climate change-related financial risks. Overall, SWFs invest less than 1 per cent of their funds[66] in low-carbon economic transition projects. The managers of SWFs should, thus, seek to better understand the impact of the low-carbon economic transition on their funds and ensure their funds contribute to achieving the Paris Agreement by:

- evaluating the impact of the low-carbon economic transition on their revenues;
- increasing the resilience of their portfolios to climate change risks; and
- investing in the low-carbon economic transition.

Each of these policies is discussed further below.

Twenty-six SWFs are financed by revenues from fossil fuel production.[67] Achieving the Paris Agreement's goals requires an overall decline in the production and consumption of fossil fuels,[68] and this may result in a decline in revenue for those funds financed by oil and gas production. Conversely, one way to reduce the consumption and production of fossil fuels is to increase taxes on fossil fuel production which could substantially increase the revenues received by SWFs. One recent study[69] concluded that a 46 per cent global tax on the revenues of oil-producing companies would cause oil production to fall to a level consistent with limiting climate change to 2 degrees Celsius, and that this would also raise US$1.9 trillion in government revenue per annum. It is, therefore, important that SWFs carefully consider the impact of public policies to achieve the Paris Agreement on their future revenues. This might include SWFs modelling their deposits, withdrawals and total assets under management under different climate change scenarios and adapting their investment policies in light of these findings.

SWFs continue to invest in carbon-intensive companies and fossil fuel companies. These investments may not be consistent with the Pairs Agreement's goals, with a recent study[70] concluding that all the major oil companies are sanctioning projects that are inconsistent with limiting climate change to well below 2 degrees Celsius and which will not deliver adequate returns in a low-carbon world.

Thus, for SWFs that are seeking to increase their resilience to climate change-related financial risk and maximise their long-term risk-adjusted return, it will be essential to develop specific, detailed policies to manage climate change-related investment risks. These policies may involve identifying and divesting from those sectors that are driving climate change. This may, for example, involve divesting from companies that mine fossil fuels and/or are carbon intensive. The Ireland Strategic Investment Fund and Norway's Government Pension Fund Global have taken significant action in this area by divesting from selected fossil fuel companies. Likewise, the equity portfolio of Trinidad and Tobago's Heritage and Stabilisation Fund is benchmarked against the MSCI EAFE ex Energy Index, which excludes companies that own oil, gas and coal reserves.

SWFs divesting from companies that mine fossil fuels and/or are carbon intensive may directly reduce the capital available to such companies. Such divestment may also signal to other investors – who see SWFs

as bellwethers due to their size, capacity and relationship with government – that fossil fuel and/or carbon-intensive companies are unlikely to have high long-term risk-adjusted returns.

However, the disadvantage of such a divestment strategy is that it may lead to the ownership of fossil fuel and carbon-intensive companies becoming concentrated among investors who are unconcerned by climate change and achieving the Paris Agreement's goals. This risk can be partly ameliorated by SWFs following the more nuanced policy of only divesting from those companies that have no strategy for making their activities consistent with the Paris Agreement's goals.

An alternative to divestment is for SWFs to actively engage with the managers of those fossil fuel-mining and carbon-intensive companies that they own to ensure that those companies have prudent strategies in place to ensure that their activities are consistent with the Paris Agreement's goals in the medium and long term. However, for SWFs to successfully pursue this engagement strategy they must have significant capacity to review and understand companies' business plans and own significant stakes in the companies they are trying to influence.

Limiting climate change also requires significant investment in the low-carbon economic transition. This will require investment in new industries, technologies, business models and production processes to decouple economic activity from greenhouse gas emissions. SWFs should develop detailed policies for identifying and evaluating investment opportunities in the low-carbon economic transition and for evaluating the contribution of these projects to the Paris Agreement's goals.

Overall, SWFs should play a leading role in investing to achieve the Paris Agreement. Their size and long-term investment horizons should give them a comparative advantage over many other investors when developing investment strategies that consider climate change, but to date many SWFs have not developed such strategies. Going forward, SWFs should rectify this by developing climate change investment strategies that consider how to invest in the low-carbon economic transition and how to reduce climate change-related investment risk.

These strategies should be consistent with the commitment of their government owners to the goals of the Paris Agreement.

4. Conclusion and Policy Recommendations

Commonwealth member countries should consider a range of capital market policies to make financial flows consistent with the goals of the Paris Agreement. This paper highlights three broad sets of such policies.

First, low-carbon economic transition businesses' access to financing at each step on the finance escalator should be reviewed, with a view to identifying the constraints these businesses face in accessing finance and considering how public policies can ameliorate these constraints.

Second, Commonwealth central banks should work to better understand climate change-related financial risks and further encourage businesses to make climate change-related financial disclosures.

Third, Commonwealth SWFs should develop detailed climate change investment strategies and ensure that their investments are consistent with the Paris Agreement's goals.

References

Authority, P R (2015). 'The Impact of Climate Change on the UK Insurance Sector: A Climate Change Adaptation Report'. https://rinj.org/documents/environment/impact-of-climate-change-on-the-uk-insurance-sector.pdf.

Authority, P R (2018). 'Transition in Thinking: The Impact of Climate Change on the UK Banking Sector'. https://www.bankofengland.co.uk/-/media/boe/files/prudential-regulation/report/transition-in-thinking-the-impact-of-climate-change-on-the-uk-banking-sector.pdf?la=en&hash=A0C99529978C94AC8E1C6B4CE1EECD8C05CBF40D.

Bank of England (2021). 'Key Elements of the 2021 Biennial Exploratory Scenario: Financial Risks from Climate Change'. https://www.bankofengland.co.uk/stress-testing/2021/key-elements-2021-biennial-exploratory-scenario-financial-risks-climate-change.

Bank of England (2021b). 'Options for Greening the Bank of England's Corporate Bond Purchase Scheme'. https://www.bankofengland.co.uk/-/media/boe/files/paper/2021/options-for-greening-the-bank-of-englands-corporate-bond-purchase-scheme-discussion-paper.pdf.

Bak, C (2017). Generating growth from innovation for the low-carbon economy: Exploring safeguards in finance and regulation. https://www.cigionline.org/sites/default/files/documents/Paper%20no.117_WEB.pdf

Baldock, R and North, D (2015). 'The Role of UK Government Hybrid Venture Capital Funds in Addressing the Finance Gap Facing Innovative SMEs in the post-2007 Financial Crisis Era'. In Hussain, G and Scott, J (Eds.). *Research Handbook on Entrepreneurial Finance*. Cheltenham: Edward Elgar Publishing.

Bank Negara of Malaysia (2021). 'Climate Change and Principles-based Taxonomy'. https://www.bnm.gov.my/documents/20124/938039/Climate+Change+and+Principle-based+Taxonomy.pdf.

Campiglio, E (2016). "Beyond carbon pricing: The role of banking and monetary policy in financing the transition to a low-carbon economy." Ecological economics 121 (2016): 220-230.

Campiglio E, Dafermos Y, Monnin P, Ryan-Collins J, Schotten G and Tanaka, M (2017). 'Finance and climate change: What role for central banks and financial regulators'. In CEP-DNB workshop on 'Central Banking and Green Finance', November (pp. 28-29). https://www.cepweb.org/wp-content/uploads/2017/12/Campiglio-paper.pdf

Capapé, J (2018). 'Financing Sustainable Development: The Role of Sovereign Wealth Funds for Green Investment'. Policy Brief, United Nations Environment Programme, 1–3.

Carbon Tracker (2019). 'Breaking the Habit: Why None of the Large Oil Companies Are Paris-aligned, and What They Need to Do to Get There'. https://www.carbontracker.org/reports/breaking-the-habit/.

Carbon Tracker (2021). 'Flying Blind: The Glaring Absence of Climate Risks in Financial Reporting'. https://carbontracker.org/reports/flying-blind-the-glaring-absence-of-climate-risks-in-financial-reporting/

Carney, M (2015). 'Breaking the Tragedy of the Horizon: Climate Change and Financial Stability'. Speech at Lloyd's of London. https://www.bankofengland.co.uk/speech/2015/breaking-the-tragedy-of-the-horizon-climate-change-and-financial-stability.

Corbishley, C and Donovan, C (2017). 'UK Green Investment Bank: Case Study'. Imperial College London. https://imperialbusiness.school/custom/uploads/2015/11/UK-Green-Investment-Bank-Case.pdf.

Criscuolo, C and Menon, C (2015). 'Environmental Policies and Risk Finance in the Green Sector: Cross-country Evidence'. *Energy Policy*, 83, 38–56.

Corbishley, C and Donovan C (2017) 'UK Green Investment Bank – Case Study', Imperial College London https://imperialbusiness.school/custom/uploads/2015/11/UK-Green-Investment-Bank-Case.pdf.

Deloitte (2021). 'The Climate Change Principle-based Taxonomy and Its Implications to Financial Institutions'. https://www2.deloitte.com/content/dam/Deloitte/my/Documents/risk/my-risk-climate-change-principle.pdf.

FTI Consulting (2021). 'TCFD Reporting in the UK'. https://fticommunications.com/wp-content/uploads/2021/04/FTI-Consulting-Report-TCFD-Reporting-in-the-UK-2017–2020.pdf.

Hauser, A (2021). 'Its Not Easy Being Green – But That Shouldn't Stop Us: How Central Banks Can Use Their Monetary Policy Portfolio to Support Orderly Transition to Net Zero'. Speech by Andrew Hauser, Executive Director, Markets, Bank of England, at Bloomberg, May 2021. https://www.bankofengland.co.uk/-/media/boe/files/paper/2021/options-for-greening-the-bank-of-englands-corporate-bond-purchase-scheme-discussion-paper.pdf.

Heffron, R (2021). 'Case Study: Carbon Pricing in Canada and South Africa'. Background paper drafted for the Commonwealth Secretariat.

HM Treasury (2020). 'A Roadmap towards Mandatory Climate-related Disclosures'. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/933783/FINAL_TCFD_ROADMAP.pdf.

IE (2018). 'Sovereign Wealth Funds 2018'. https://docs.ie.edu/cgc/SWF-CGC-2018.pdf.

IEA (2021a). 'Global Energy Review 2021'. https://www.iea.org/reports/global-energy-review-2021?mode=overview.

IEA (2021b). 'World Energy Outlook 2020'. https://www.iea.org/topics/world-energy-outlook.

IEA (2021c). 'World Energy Investments 2020'. https://www.iea.org/reports/world-energy-investment-2021.

Krogstrup, S and Oman, W (2019). 'Macroeconomic and Financial Policies for Climate Change Mitigation: A Review of the Literature'. Danmarks Nationalbank Working Papers, No. 140

Kyange, J (2017). 'The Ethical Investment

Boom'. *Financial Times*. September https://www.ft.com/content/9254dfd2–8e4e-11e7-a352-e46f43c5825d.

McGlade, C and Ekins, P (2015). 'The Geographical Distribution of Fossil Fuels Unused when Limiting

Global Warming to 2 C'. *Nature*, 517(7533), 187–190.

Murzacheva, E and Levie, J (2020). 'Entrepreneurial Finance Journeys: Embeddedness and the Finance

Escalator'. *Venture Capital*, 22(2), 185–214.

National Audit Office (2017). 'The Green Investment Bank'

New Zealand Super Fund (2019a). 'Climate Change Investment Strategy'. https://www.nzsuperfund.nz/assets/documents-sys/Guardians-of-NZ-Super-Climate-Change-White-Paper-March-2019.pdf.

New Zealand Super Fund (2019b). 'Greenhouse Gas Statement over the Investment Portfolio'. https://nzsuperfund.nz/assets/Uploads/NZ-Super-GHG-Statement-10th-October-FINAL.pdf.

North, D, Baldock, R and Ullah, F (2013). 'Funding the Growth of UK Technology-based Small Firms since the Financial Crash: Are There Breakages in the

Finance Escalator?'. *Venture Capital*, 15(3), 237–260.

Owen R, Lyon F and Brennan G (2018). 'Enabling Investment for the Transition to a Low Carbon Economy: Government Policy to Finance Early Stage

Green Innovation'. *Current Opinion in Environmental*

Sustainability Special Issue for the Intergovernmental Panel on Climate Change Sixth Assessment Cycle and Special Report on Global Warming, 31, 137–145.

Parry I (2021) 'Five Things to know about Carbon Pricing' Finance & Development, September

Plimmer, G (2021). 'Macquarie Confirms £3bn

Financing of UK Green Projects'. *Financial Times*, January. https://www.ft.com/content/b17eb030–7943–4fc3–94ff-8f9a04663484.

Polzin, F (2017). 'Mobilizing Private Finance for Low-carbon Innovation: A Systematic Review of Barriers

and Solutions'. *Renewable and Sustainable Energy*

Reviews, 77, 525–535.

SQW (2015). 'Evaluation of Smart: Impact and Process Evaluation'. Report by SQW to the Department for Business, Energy and Industrial Strategy and Innovate UK, September. http://www.sqw.co.uk/files/7914/4615/4871/Smart_Evaluation__Final_Final_Report_7_October.pdf.

TCFD (2021). 'Task Force on Climate-related Financial Disclosures, Overview, March 2021'. https://assets.bbhub.io/company/sites/60/2020/10/TCFD_Booklet_FNL_Digital_March-2020.pdf.

UNEP (2021). 'Emissions Gap Report 2020'. https://wedocs.unep.org/bitstream/handle/20.500.11822/34438/EGR20ESE.pdf?sequence=25.

Van Lerven, F and Ryan-Collins, J (2017). 'Central Banks, Climate Change and the Transition to a Low-carbon Economy: A Policy Briefing'. New Economics Foundation.

Van Steenis, H (2021). 'Investors Should Prepare for the Impact of Green Stress Tests

on Banks'. *Financial Times*, June. https://www.ft.com/content/68ebd27a-232e-413a-95c8–3b3dd267daba.

WCTIJ (2017). 'Working Group on Clean Technology, Innovation and Jobs Report'. September 2017.

Wilde, D (2020). 'Should Sovereign Wealth Funds Invest to Achieve the Paris Agreement?'.https://archive.ifswfreview.org/2019/our-partners/should-sovereign-wealth-funds-invest-achieve-paris-agreement

Wilde, D and Price, R (2017). 'Can a Global Oil Royalty Help to Limit Climate Change?'. https://www.oecd-ilibrary.org/content/paper/4626f3f1-en

Wilson, Z and Caldecott, B (2021). 'The Energy Transition and Changing Financing Costs'. https://www.smithschool.ox.ac.uk/research/sustainable-finance/publications/The-energy-transition-and-changing-financing-costs.pdf.

Endnotes

1 More specifically, global energy-related emissions of carbon dioxide increased from 32.2 gigatons to 33 gigatons between 2015 and 2021 according to the IEA (2021a).

2 UNEP (2021).

3 IEA (2021b).

4 IEA (2021c).

5 The term 'Paris Agreement's goals' is used here to refer to the 2 degrees Celsius and the 1.5 degrees Celsius targets.

6 Carney (2015).

7 Kyange (2017).

8 Krogstrup and Oman (2019).

9 Parry (2021); and Wilde and Price (2017).

10 Although the Australian Emissions Reduction Fund, which is currently being implemented, is a form of carbon pricing.

11 Heffron (2021).

12 Campiglio et al. (2017).

13 Campiglio (2016).

14 Campiglio et al. (2017).

15 Owen et al. (2018).

16 Owen et al. (2020)

17 Bak (2017).

18 See: Murzacheva and Levie (2020).

19 This section draws on Owen et al. (2018).

20 SQW (2015).

21 WCTIJ (2017).

22 North et al. (2013).

23 Criscuolo and Menon (2015).

24 Baldock and North (2015).

25 Polzin (2017).

26 Ibid.

27 Plimmer (2021).

28 NAO (2017).

29 Ibid.

30 Corbishley and Donovan (2017).

31 National Audit Office (2017).

32 In some Commonwealth member countries, a separate (from the central bank) agency is responsible for prudential financial regulation. This paper uses the term 'central bank' to refer to the institution or institutions responsible for monetary policy and/or prudential financial regulation.

33 Campiglio et al. (2017).

34 Physical risk arises due to climate-related floods, hurricanes and other extreme weather events damaging property and impacting insurance liabilities and other financial assets. Liability risks refer to possible future claims by parties that suffer the effects of climate change on those companies that are adjudged to have caused global warming. Transition risks refer to the losses that may arises due to changes in current or expected future returns due to changes in public policies, technology or physical risks related to the low-carbon transition.

35 Van Steenis (2021).

36 Wilson and Caldecott (2021).

37 Authority (2015).

38 Authority (2018).

39 Bank of England (2021).

40 The early transition scenario assumes that the transition to net zero starts in 2021, with public policies gradually intensifying over time. In this scenario, net zero is reached in 2050 and global warming is limited to 1.8 degrees Celsius, and while some sectors are negatively affected the overall impact on gross domestic product growth is limited.

41 The late transition scenario assumes that the implementation of policy is delayed until after 2031 and is more abrupt and disorderly. Global warming is still limited to 1.8 degrees in this scenario, but the late and abrupt policy implementation leads to a recession, falling employment and higher risk premiums across financial markets.

42 The no additional action scenario assumes no new policies to limit climate change and temperatures rising to 3.3 degrees Celsius above pre-industrial levels. This results in more extreme weather events, permanent impacts on living conditions, lower economic growth and increased macroeconomic uncertainty.

43 See: https://www.ngfs.net/ngfs-scenarios-portal/.

44 Campiglio et al. (2017).

45 Ibid.

46 TCFD (2021).

47 HM Treasury (2020).

48 TCFD (2021).

49 FTI Consulting (2021).

50 Carbon Tracker (2021).

51 Bank Negara of Malaysia (2021).

52 This box draws on Deloitte (2021) .

53 This is, for example, the approach taken by both the Bank of England's Corporate Bond Purchase Scheme and the European Bank's Corporate Sector Purchase Programme.

54 Van Lerven and Ryan-Collins (2017).

55 Krogstrup and Oman (2019).

56 Bank of England (2021b).

57 Hauser (2021).

58 This section is based on an earlier article by Wilde (2020).

59 See: https://oneplanetswfs.org/.

60 New Zealand Super Fund (2019a).

61 This is defined as: emissions intensity per US dollar of firms' sales (tonnes of CO2e4/$USm sales).

62 This is defined as: potential emissions from fossil fuel reserves per US dollar invested (tonnes CO2e/NAV5 $USm).

63 New Zealand Super Fund (2019b).

64 Outside of the Commonwealth, the Ireland Strategy Investment Fund and Norway's Government Pension Fund Global have made significant moves to divest from selected fossil fuel companies.

65 See: https://www.temasek.com.sg/en/our-sustainability-journey/focusing-on-climate-change#metrics-targets.

66 Capapé (2018).

67 IE (2018: 26).

68 McGlade and Ekins (2015).

69 Wilde and Price (2017).

70 Carbon Tracker (2019).

The Commonwealth

Natural Resource Insights

Commonwealth Natural Resource Insights is a peer-reviewed publication which provides concise and informative analyses on natural resource (oil, gas, mining) and energy related issues, prepared both by Commonwealth Secretariat and international experts.

Authored by: Daniel Wilde

Series editor: Naadira Ogeer

Produced by Trade, Oceans and Natural Resources Directorate of the Commonwealth Secretariat

For further information or to contribute to the Series, please email n.ogeer@commonwealth.int

Commonwealth Secretariat
Marlborough House, Pall Mall, London SW1Y 5HX, United Kingdom
Tel: +44 (0)20 7747 6500 Fax: +44 (0)20 7830 9081
www.thecommonwealth.org

D17914