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the Case of the Swiss National Bank's Foreign Exchange Reserves and the Norwegian Oil Fund

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WORKING paper

BANQUE DE FRANCE
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Responsibility for Emissions: the Case of the Swiss National Bank's Foreign Exchange Reserves and the Norwegian Oil Fund

Jens van 't Klooster[1] and Alain Naef[2]

April 2022, WP #872

ABSTRACT

Should public investors take responsibility for the greenhouse gas emissions of the firms that they invest in? This paper answers this question through a comparative study of two very different investors: the Swiss National Bank (SNB)'s foreign exchange portfolio and the world's largest sovereign wealth fund, the Norges Bank Investment Management (NBIM), the Norwegian sovereign wealth fund. Although both funds target positive returns, the SNB presents itself as a market neutral investor, whereas the NBIM is one of the world's leading public ethical investment vehicles. Despite having a carbon footprint 10 times higher than the SNB, the NBIM potentially has a more positive impact to stop climate change. The NBIM uses divestment, shareholder engagement and moral leadership to try to mitigate the impact of its portfolio. The SNB on the other hand has a mainly passive approach, with only some minor exclusions. Comparing the impact of their strategies, the paper provides the first detailed study of the powers available to public investors in pursuing environmental objectives.

Keywords: Public Investors, Carbon Footprint, Public Investment, Shareholder Engagement.

JEL classification: E58, P18, Q35, Q48, Q58

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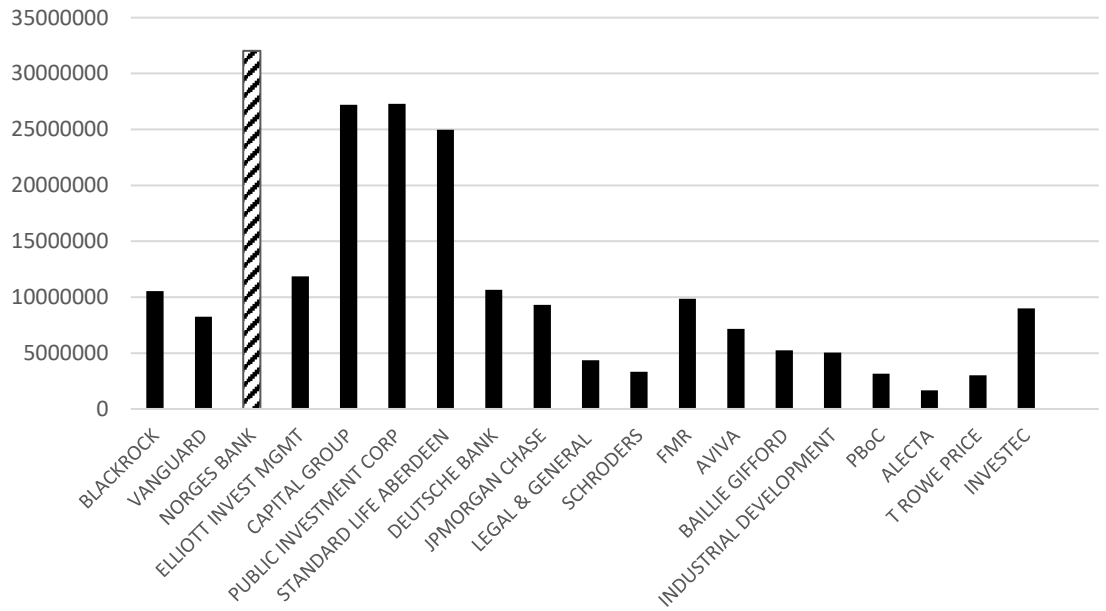
NON-TECHNICAL SUMMARY

Public investors such as sovereign wealth funds, pension funds and central banks have an increasingly prominent role in financial markets. The companies they invest in generate large amounts of CO2 emissions and have an important role to play in the transition to a "low carbon" economy.

We compare two opposed perspectives on how public investment deals with emissions. The first perspective assigns to investors an "active" role, which holds that in addition to pursuing the highest returns, a public investor should also serve the common good. The iconic investor in this regard is the Norwegian sovereign wealth fund, Norges Bank Investment Management (NBIM). The figure below shows the variation in its investment in BHP, the largest mining company in the world. The NBIM does not shy away from frequent investment and divestment. It is the largest public investor whose portfolio reflects an attitude of responsibility for emissions. Although the NBIM's overriding objective remains that of generating returns, the fund also promotes decarbonization through their investment strategy.

The Swiss National Bank (SNB) on the other hand takes a "market neutral" approach, which holds that public investors should follow the market and not attempt to achieve environmental impact through their portfolio. This approach is underpinned by the view that as a public actor it is bound by a requirement of neutrality and impartiality in the treatment of market participants. It also reflects a democratic concern that climate policy should be pursued by more traditional tools of economic policy such as taxation and regulation outside the central bank's remit.

Standard deviation of number of BHP shares held by the Norges Bank (2016-2021)



Source: Authors' calculations based on data from Bloomberg.

We compare the NBIM and SNB in terms of their strategy and its impact. We focus on three aspects: portfolio policy, shareholder engagement and moral leadership. The portfolio policy sets the criteria for firms included in the fund's portfolio. Shareholder engagement concerns the use of voting rights and other means available to asset owners to influence the corporate strategy of their issuer. Moral leadership concerns the various ways in which the fund's investor policy, shareholder engagement and broader communicative efforts shape the investment and shareholder policies of other investors.

The NBIM is an active investor and uses shareholder engagement to encourage companies to change, notably on the issue of transition. In 2020, the NBIM had 2877 meeting with the companies it is

invested in and it went to vote at 11871 shareholder meetings. One of the companies it frequently engages with is BHP, mentioned above. Part of the success of the engagement strategy of the NBIM comes from its willingness to divest from a company if it does not follow its recommendation. While this has a limite direct effect on prices as other investors will buy the shares, it works as it makes its engagement policy credible. As can be seen on the figure above, the NBIM offers the largest standard deviation in its investment among the top-20 investors in BHP. This willingness to invest, divest and reinvest makes its engagement strategy more credible than that of other large investors, which show a much lower standard deviation and tend to hold shares, regardless of the behaviour of companies.

A close analysis of the impact of the three levers provides four key results. First, we show that the widely used metric of the "carbon footprint" provides an inadequate proxy for impact. In fact, the Norwegian institution turns out to do worse than the SNB on this metric, even when adjusting for the size of their respective portfolio. That is, the NBIM has a larger carbon footprint than the SNB per dollar invested. Second, these paradoxical results reflect important interactions and potential conflicts between the use of the three levers. While divestment and shareholder engagement are mostly incompatible, our framework allows us to bring out a more nuanced set of interactions in the context of public investors' strategic choices. Third, we show that, while the investment strategy is potentially impactful via the modalities of the portfolio and shareholder engagement, that impact is limited, and hardly commensurate with the size of their portfolio: while decarbonizing a portfolio is easy, having an actual impact on climate change as an investor is more difficult. Finally, we suggest that the impact of public investment funds is potentially largest through moral leadership. Large public investors can change the moral cursor by communicating their perspective on what is an acceptable investment and what is not. For example, by divesting from carbon intensive firms, public investors signal that these investments are morally questionable. Despite its crucial role the nature of this channel makes actual impact elusive and hard to quantify, meriting much more attention from empirical researchers.

Les émissions de CO2 de la Banque Nationale Suisse et du Fonds Pétrolier Norvégien

RÉSUMÉ

Les investisseurs publics doivent-ils assumer une responsabilité des émissions de gaz à effet de serre des entreprises dans lesquelles ils investissent ? Cet article répond à cette question à l'aide d'une étude comparative de deux investisseurs très différents : le portefeuille en devises de la Banque nationale suisse (BNS) et le plus grand fonds souverain du monde, la Norges Bank Investment Management (NBIM), le fonds souverain norvégien. Bien que les deux fonds visent des rendements positifs, la BNS se présente comme un investisseur neutre par rapport au marché, tandis que la NBIM est l'un des principaux investisseurs éthiques au monde. Malgré une empreinte carbone dix fois supérieure à celle de la SNB, la NBIM a potentiellement un impact positif pour stopper le changement climatique. La NBIM utilise le désinvestissement, l'engagement des actionnaires et le leadership moral pour tenter d'atténuer l'impact de son portefeuille. La BNS, quant à elle, a une approche principalement passive, avec seulement quelques exclusions mineures. En comparant l'impact de leurs stratégies, l'article fournit la première étude détaillée des pouvoirs dont disposent les investisseurs publics pour aider à la transition énergétique.

Mots-clés : politique monétaire, marchés des changes, système de Bretton Woods

Les Documents de travail reflètent les idées personnelles de leurs auteurs et n'expriment pas nécessairement la position de la Banque de France. Ils sont disponibles sur publications.banque-france.fr

Public investors such as sovereign wealth funds, pension funds and central banks have an increasingly prominent role in financial markets. Do these investors have a responsibility for the greenhouse gas emissions of the firms that they invest in? We compare two opposing perspectives on the question of responsibility for emissions. The first perspective assigns to investors an "active" role, which holds that in addition to pursuing the highest returns, a public investor should also serve the common good.

The iconic investor in this regard is the Norwegian sovereign wealth fund, Norges Bank Investment Management (NBIM). The NBIM is the largest public investor, whose portfolio reflects an attitude of responsibility for emissions; the NBIM tasks itself with moral obligations to design its investment so as to improve the climate impact of the firms it invests in. Although the NBIM's overriding objective remains that of generating returns, the fund also promotes decarbonization through their investment strategy.

The NBIM's approach contrasts markedly with the "market neutral" approach, which holds that public investors should not attempt to achieve environmental impact through their portfolio. The Swiss National Bank (SNB) explicitly denies responsibility for emissions. Its approach is underpinned by the view that as a public actor it is bound by a requirement of neutrality. Market neutrality precludes favouring some market participants over others. It is informed by a concern to be impartial in the treatment of market participants. It also reflects a democratic concern that climate policy should be pursued by more traditional tools of economic policy such as taxation and regulation outside the central bank's remit.

To contribute to the ethical study of these vastly divergent strategies, this article studies to what extent the opposed approaches to public investment impact the climate. That their investment strategies matter may seem obvious. The NBIM has $1.402bn in assets under management, and the SNB has $991bn.[1] In terms of assets under management, these are the 7th and 4th largest public asset managers (Official Monetary and Financial Institutions Forum [OMFIF], 2019). Their distinct attitudes, which to some extent reflect distinct public policy tasks, inform the design of

[1] Assets by December 2020 for the SNB and 4 January 2021 for the NBIM. Note that the NBIM offers a live valuation of its assets on its website whereas the SNB only periodically publishes the value of its portfolio.

these portfolios. For example, the SNB's policy of market neutrality commits it to follow market indices. It tends to be biased towards carbon intensive industries, and hence favour carbon heavy industries (Dafermos, Gabor, Nikolaidi, Pawloff, & Lerven, 2020; Matikainen, Campiglio, & Zenghelis, 2017; van 't Klooster & Fontan, 2020). Looking at the broadest measure of emissions generated by their portfolios, the Swiss investments reflect 23% of Swiss emissions and the Norwegian investments represents an incredible 160% of total Norwegian emissions.[2] From this perspective, Norwegians generate more CO2 through their investment fund than they do with all their yearly activities, including flying, eating meat, heating their homes and so on.[3] How could such policies fail to impact emissions?

However, despite their distinct approaches to environmental responsibility, the funds are remarkably similar in that they invest in global equity and bond markets.[4] As a consequence of this investment strategy, their ability to influence the behaviour of individual firms, either through their cost of funding or shareholder activism, is unavoidably limited. Hence, we ask (1) What is the climate impact of the Swiss National Bank (SNB) and the Norges Bank Investment Management (NBIM), and (2) What can large public investors do to prevent catastrophic climate change?

We understand investor impact as consisting of operational changes made by firms as a result of the investor's investment strategy and its pursuit thereof (Kölbel, Heeb, Paetzold, & Busch, 2020). Building on this definition, we propose a three-fold taxonomy of levers available to public investors to increase or reduce their impact. First, a fund sets a portfolio policy which determines which issuers and assets are eligible to be purchased by the investor. The NBIM has an ambitious

[2] 50.3 million tons CO2 equivalent for 2019. The Norwegian data for 2019 is available at https://www.ssb.no/en/klimagassn.The latest data on Swiss CO2 (2017) are 53,143 million tons of CO2. The figure is for total greenhouse gases, excluding CO2 from the biomass, in equivalent tons of CO2. This number is likely to be similar for 2019 (but not 2020 because of Covid) as the 1990-2017 average is 56,51 million tons of equivalent CO2. The data can be downloaded here: https://www.bfs.admin.ch/bfs/fr/home/statistiques/themes-transversaux/mesure-bien-etre/tous-indicateurs/environnement/emissions-gaz-effet-serre.assetdetail.10027928.html. Naef (2020) offers more details on the carbon footprint of the portfolio of the SNB and shows with alternative calculations, how the portfolio of the SNB generates as much CO2 as all Swiss households combined. Fahlenbrach & Jondeau (2021) and Artisans de la transition (2020) also offer alternative estimates.

[3] Note also that the source of the assets is different. The NBIM generated revenue thanks to oil sales, which likely had a large carbon footprint. The SNB generated money by issuing currency which unlikely had a large carbon footprint.

[4] Note however that the NBIM has a larger percentage of its portfolio invested in equities, whereas the SNB has invested more in government bonds.

list of exclusions whereas the SNB exclusions are much more limited. Second, funds set a shareholder engagement policy, which concerns the use of ownership rights such as voting rights to influence the corporate strategy of firms. The shareholder engagement of the NBIM is active, while that of SNB is not.[5] And finally, public investment funds determine how to use their moral leadership which is the impact that their approach to investing has on other investors' investment and shareholder engagement. Public investors have a large role to play to set "global moral norms", which could help create the conditions for global climate mitigation (Green, 2018). Again, the NBIM endorses its role as a moral leader, while the SNB does not.

How can we expect these different levers available to public investors such as the NBIM and the SNB to have environmental impact? We use contrasting case studies to situate different aspects of the investment strategy in the operational reality of large public investment funds. Because the NBIM and the SNB invest in US equities, their investments have to be disclosed to the Securities and Exchange Commission (SEC). Other large investments are often also disclosed in companies' annual reports. Focusing on this publicly available data we ask how, and whether, their opposed attitudes to impact investment translate into different environmental outcomes. Focusing on market impact, most empirical support is available for shareholder engagement, where investors seek to change company behaviour by making specific requests (Kölbel et al., 2020). The evidence concerning investment policies is more mixed. Meanwhile, there is less literature on the potential of the impact of moral leadership. That is a striking omission since, as we argue, moral leadership is possibly the most impactful strategy for large public investors.

A close analysis of the impact of the three levers provides four key results. First, we show that the widely used metric of the "carbon footprint" provides an inadequate proxy for impact. In fact, the Norwegian institution turns out to do worse than the SNB on this metric, even when adjusting for the size of their respective portfolio. That is, the NBIM has a larger carbon footprint than the SNB per dollar invested. Second, these paradoxical results reflect important interactions and potential conflicts between the use of the three levers. While divestment and shareholder engagement are mostly incompatible, our framework allows us to bring out a more nuanced set of interactions in

[5] The SNB still votes, but does not do any shareholder engagement.

the context of public investors' strategic choices.[6] Third, we show that, while the investment strategy is potentially impactful via the modalities of the portfolio and shareholder engagement, that impact is limited, and hardly commensurate with the size of their portfolio: while decarbonizing a portfolio is easy, having an actual impact on climate change as an investor is more difficult. Finally, we suggest that the impact of public investment funds is potentially largest through moral leadership. Large public investors can change the moral cursor by communicating their perspective on what is an acceptable investment and what is not. For example, by divesting from carbon intensive firms, public investors signal that these investments are morally questionable. Despite its crucial role the nature of this channel makes actual impact elusive and hard to quantify, meriting much more attention from empirical researchers.

Impact and the investment strategies of the NBIM and the SNB

How do the NBIM and the SNB think about their responsibilities for the greenhouse gas emissions of the firms they invest in? The impact of an investment fund is the change that the fund enacts in the behaviour of companies through its investment strategy and the implementation of that strategy (Kölbel et al., 2020). When it comes to climate change, we conceptualize impact in terms of changes to emissions due to the fund. Investment funds do not typically have sizable direct emissions. They mainly operate offices with limited direct impact. If at all impactful, this results from their influence on corporations and their business decisions. For there to be impact, there has to be a clear relationship between the choice of the investment fund and emissions in the economy.

To the extent that investors have potential impact through their investment decisions, they can take responsibility for that impact or not. Taking responsibility involves taking active measures to make investor impact beneficial and to justify investment decisions with reference to their impact.

We compare the NBIM and SNB in terms of their impact. We focus on three levers available within their investment strategy to have impact: portfolio policy, shareholder engagement and moral leadership. These levers do not exhaust the means available to funds (Kölbel et al., 2020), but are specific to the stock market portfolios of foreign public investors that we focus on.

[6] Goodman, Louche, van Cranenburgh, & Arenas (2014) show that some activist investors engage with firms even after they divested.

The first lever is portfolio policy, which concerns the criteria for firms included in the fund's portfolio. The portfolio policy may be governed entirely by consideration of return. It may also be designed to include or exclude specific firms based on environmental criteria. The investment policies of the fund can affect firm behaviour in various ways. The most obvious impact results from the effect of buying or selling an asset on its market price. Market price may in turn indirectly influence the cost of funding should the firms initiate new activities. In theory, ethical investors can impact market prices if non-ethical investors demand a premium to invest in excluded assets (Fama & French, 2007; Luo & Balvers, 2017). To the extent that exclusion is deemed to have price effects, this can incentivize firms to adhere to environmental criteria. Financial market prices are not just relevant to the strategic objective of the firm, but also to the compensation of management tied to these prices (Edmans, Goldstein, & Jiang, 2012). If management owns shares or stock options in the firm, they will be incentivized to act in ways to avoid divestment.

Shareholder engagement concerns the use of voting rights and other means available to asset owners to influence the corporate strategy of their issuer. Shareholder voting rights can be used during annual meetings to push the firm to adopt certain policies. Major investors are generally also involved when it comes to strategic decisions. For example, the NBIM owns 3.07% of BP and is a major shareholder, which means that it is consulted whenever major decisions are made. We take a specific subset of divestment policies to be part of shareholder engagement. As we will see, the NBIM's divestments policy works via open communication that is facilitated by ownership, rather than via price signals that divestment sends to the market. The NBIM first puts companies on a grey list to invite them to change their behaviour. If the behaviour of the companies does not change, they proceed to divest. Accordingly, we consider this policy as part of shareholder engagement, although it of course could also have price effects (however, we do not find those).

There is a clear tension between the use of shareholder and investment policies, since active shareholder policies by definition require the assets to be included in the portfolio. Moreover, although the SNB and NBIM are both sizable, their choices are comparatively small in the context of the broader market. Hence, the question arises how much impact their individual choices have in the face of financial market practices that they cannot individually control.

The third lever, moral leadership, may be the most powerful lever available to public investors. Moral leadership concerns the various ways in which the fund's investor policy, shareholder engagement and broader communicative efforts shape the investment and shareholder policies of other investors. A public investor who divests sets an example for private investors to do the same. Similarly, a public investor continuing such investments presents these as acceptable. In this way, public investors signal to the market and the public what they think is acceptable behaviour and what is permitted within the bounds of the law. They thereby set a lower standard for what counts as morally permissible. Public investors can also do more and provide an example of what counts as ethical investment behaviour. Their sheer size makes public investment funds highly visible and, thereby, they provide a salient reference point for other investors to follow.

The importance of moral leadership is hard to quantify, and its importance depends in part on deeper questions about how markets work. For example, moral leadership is particularly impactful if markets are not efficient, but adaptive (as in Lo, 2019). In this framework, markets are driven by learning through adaptation of prior heuristics and developing new heuristics in price formation. Similarly, the literature on climate ethics has long grappled with the role of individual choices in the context of climate change understood as a tragedy of the commons. A key insight from that literature is that moral leadership enhances the impact of individual behaviour. It works through its influence on how other actors perceive the choices they face and what is suitable behaviour - the so-called Confucian model of agency (Hourdequin, 2010). Hence, rather than offsetting their choices, inter-agent dynamics may also strengthen through the influence of their moral leadership on choices made by other investors. The upshot of this perspective is that prominent ethical investors can shape financial markets in the long run.

We now turn to the ways in which the NBIM and the SNB use these different levers.

The NBIM

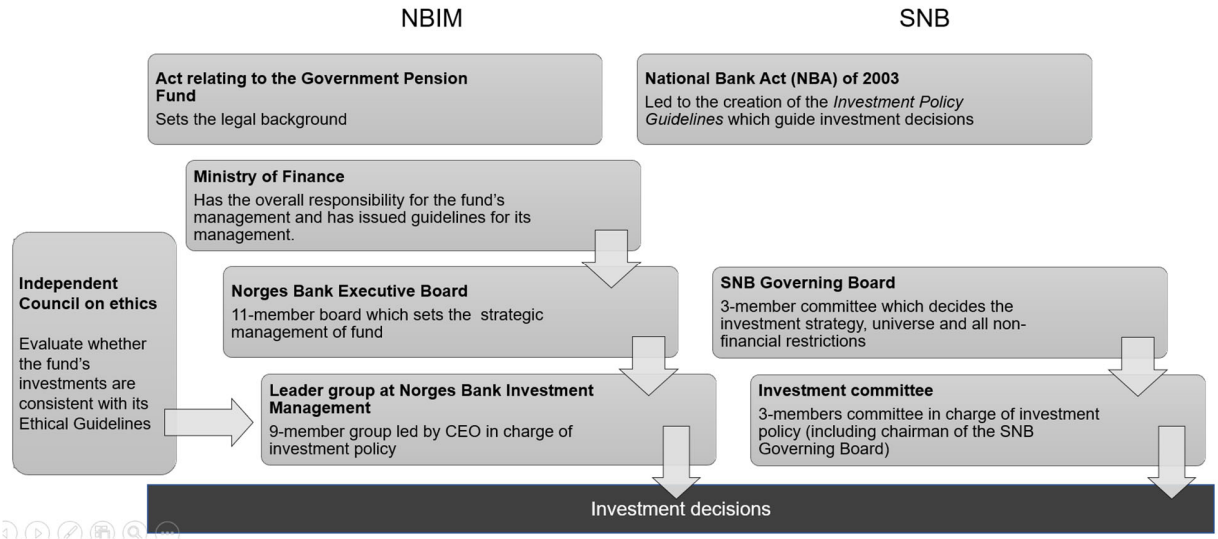
The Norges Bank Investment Management (NBIM) is part of the Norwegian central bank tasked with managing the investments of the "Norwegian Pension Fund – Global", better known as the Norwegian oil fund. It is worth just over 12.4 trillion Norwegian Krone ($1.4 trillion), which the fund uses for what we describe as an "activist" investment strategy.

The NBIM's policy: Active investment

The oil fund was established in 1990 by the Norwegian parliament to shield the income generated from the country's petroleum wealth from the day-to-day expenditures of the treasury. The fund started investment in equities in 1998. Initially relying on external providers, it has since developed an ambitious ethical investment strategy. In 2004, the Council on Ethics for the Government Pension Fund Global was created to establish whether the investments of the NBIM are consistent with the ethical guidelines established by the Norwegian Treasury (see Figure 1).

The NBIM's objective is "to generate the highest possible return, net of costs". This primary goal is qualified by the provision that "A good long-term return is considered to depend on sustainable economic, environmental and social development, as well as on well-functioning, legitimate and efficient markets" (NBIM, 2019, p. 2). Within these objectives, the NBIM has an attitude of responsibility for emissions; the NBIM takes itself to have moral obligations to design its investments so as to improve the climate impact of the firms it invests in. The NBIM also measures its impact on the environment in terms of emissions. However, its overriding objective is returns, while its further objectives are treated as subordinate to and supportive of the highest possible returns. In this regard it is not an impact investor; it does not subordinate its investment strategy to the objective of maximizing impact.

Figure 1 Governance structure of the NBIM and SNB funds



Note: the SNB also has a committee responsible for non-financial aspects of investments, which formulates recommendations to the Board of Governors. From public materials available on the SNB website and elsewhere, it is unclear where this committee stands with regards to the others and how many members it has. It is also unclear if its members are different from other committees and if it has any independence to make recommendations.

Portfolio policy

The NBIM has clear exclusion criteria. It does not invest in tobacco, some weapon manufacturers, as well as coal mining and coal energy production. Conduct-based exclusion criteria include human rights violations, but also "severe environmental damage" and "acts or omissions that on an aggregate company level lead to unacceptable greenhouse gas emissions" (NBIM, 2020a). The governance of the NBIM relies on a series of institutional layers, which are presented in Figure 1 above. The NBIM also engages in explicitly green lending. In 2019, they had 62.3 billion kroner ($7bn) invested in shares in 77 companies and 17.1 billion kroner ($1.9bn) invested in green bonds "under dedicated environmental mandates" (NBIM, 2020a, p. 41). The NBIM portfolio excludes investment "in companies that produce certain types of weapon, base their operations on coal, or produce tobacco" (NBIM, 2020b, p. 86). These guidelines come from the Norwegian Ministry of Finance, whereas for Switzerland the SNB has no political guidance on what investments to choose. The NBIM has clear policies to exclude companies that make more than 30% of their revenues producing coal and producing electricity using coal (NBIM, 2020b, p. 86).

Shareholder engagement

The NBIM is a lead active investor. This can be seen in its voting behaviour, for which it publishes detailed voting guidelines. Where the guidelines are unclear, it deliberates on the correct vote: "We identify such cases, analyse them individually and vote according to our principled position on good corporate governance." (NBIM, 2020b, p. 33). In 2020, the NBIM had 2877 meeting with the companies it is invested in.[7] They also wrote to 650 companies to voice their concern and it went to vote at 11,871 shareholder meetings (or 98% of the meetings they were invited to).

[7] https://www.nbim.no/en/publications/reports/2020/responsible-investment-2020/

In the last part of this paper, we present a case study of activism. The very tool of divestment is also closely associated with the NBIM. Few investment vehicles have managed as many divestment campaigns as the NBIM.

Moral leadership

The NBIM has been at the forefront of moral leadership in communicating its actions and their justifications to the broader public. This serves to increase the Fund's visibility as an investor and give it more leverage over corporate issues. The NBIM has been publicly disclosing some of its voting decisions since 2015, it claims has increased the effectiveness of its shareholder engagement.[8] The NBIM publishes its voting intentions three days before Annual General Meetings. It is often one of the first to voice its voting intentions on corporate issues, setting the tone for shareholder voting. As few investors do this, the voting guidance of the NBIM often impacts other investors as well. Its intentions are frequently picked up in the financial press in reporting.[9] This is a policy of moral leadership when it leads other investors to vote accordingly or even take public positions on their own voting decisions.

The SNB

The Swiss National Bank pursues its monetary policy objectives in part by intervening in currency markets. As a consequence, its foreign exchange reserves currently have a value of CHF 910bn ($991bn), which amount to 132% of the Swiss GDP or $86,000 per citizen.[10] To invest these funds it has developed what we describe as a "market neutral" approach.

The SNB's policy: Market Neutrality

The Swiss National Bank was created in 1907 and is one of the oldest independent central banks in the world. Its objectives are spelled out in its legal mandate, which provides few details on how to implement its monetary policy. Its main objective is to "ensure price stability" though "[i]n so doing, it shall take due account of economic developments" (National Bank Act [NBA] Article 5).

[8] https://www.ft.com/content/6a44f742-bb18-11e7-8c12-5661783e5589
[9] See for example https://www.ft.com/content/ca33f62e-242a-4304-9895-f7cea36a497e
[10] GDP, population and asset figures for 2020.

Because Switzerland is a small open economy, domestic price stability depends in large part on the exchange rate, which the SNB stabilizes by buying foreign assets. From 2011 onwards, the SNB pursued a peg of SFr 1 = EUR 1.20, which was abandoned in January 2015. Maintaining this peg led the SNB to accumulate a massive foreign currency denominated portfolio. Today, interventions take place on a discretionary basis "as necessary".

Foreign exchange interventions involve the issuing of new Swiss franc denominated SNB-deposits to purchase dollars and foreign currencies. These foreign currencies are then used to buy foreign bonds and equities subject to two criteria: liquidity and the preservation of the long-term nominal value of the portfolio (SNB, 2015). Liquidity means that assets purchased need to be sellable quickly. To accommodate changing circumstances in foreign exchange markets, the SNB seeks to ensure that its reserves can be sold without loss of value in response to the SNB's monetary policy decisions.

Although the SNB does not present itself as such, its investment strategy is for most intents and purposes best understood as that of a long-term wealth manager. Although it emphasizes the importance of liquidity, it is exceedingly improbable that the SNB would seek to liquidate the entirety of its portfolio at short notice. The SNB's current portfolio has been built up over a period of over a decade and is unlikely to be quickly liquidated. Current trends in inflation probably mean that the portfolio will keep on growing. Even if the SNB wanted to reduce the money in circulation (or M3) by 20% because of inflationary pressure (which would be quite extreme), it would only use 31% of the current portfolio of 910bn CHF.[11] In such a case, the SNB would probably not run into liquidity problems and could easily sell very liquid government bonds first, before rebalancing its portfolio and slowly selling its equities. Accordingly, even heavy inflationary pressures are unlikely to force the SNB to sell their equities quickly. They are therefore best understood as a long-term investor and liquidity concerns are only a limit constraint on the equity proportion of its portfolio. Arguably, the SNB is *de facto* already a sovereign wealth fund.

[11] A 20% money supply reduction would mean reducing the money supply from 1411bn CHF to 1128.8bn. Again, note how extreme such a scenario would be. Yet, even in this extreme case, this would reduce the 910bn CHF portfolio by 31%.

The second objective of the SNB is to ensure that assets retain their value. To this end, the SNB pursues a conservative investment strategy. It seeks to ensure that investments "are expected to at least retain their real value over the long term". Because of the franc's upward trajectory, a stable value requires a positive return on investments. In theory, there would be no reasons for the SNB to lose money on its balance sheet; unlike a private firm, its solvency is not enforceable in court. However, the SNB fears that negative equity will impact its reputation and force it to ask for recapitalization from fiscal authorities, thereby jeopardizing its independence. The Swiss regions (or cantons) are receiving part of the profit of the SNB, and this is important for local government balance sheets. This therefore restricts the independence of the SNB, putting pressure on the institution to make constant profits.

The SNB explicitly adheres to a policy of market neutrality, understood as the objective of ensuring that its investments have "as small an impact as possible on the relative share prices of individual companies or sectors" (Maechler, 2016). This policy serves to "prevent […] specific biases towards or against certain companies or sectors from influencing our investment policy" (Jordan, 2017b). This leads the SNB to diversify across currencies and markets. Bonds must be indexed and traded in liquid secondary markets. Equities are eligible only if they "feature in the leading share indices" (SNB, 2015). The goal is that the central bank does not actively pick winners on the market.

The normative underpinning of market neutrality is the view that climate policy should be pursued by more traditional tools of economic policy such as taxation and regulation. Public investors should broadly follow market indices, since doing otherwise would involve making political choices, thereby politicizing monetary policy (ECB, 2017; Jordan, 2017a, 2017b).

Portfolio policy

Despite its stated policy of market neutrality, the SNB does apply some substantive social criteria, banning purchases from companies that "produce internationally banned weapons, seriously violate fundamental human rights or systematically cause severe environmental damage" (SNB, 2015, p. 2). To avoid potential conflicts of interest, the SNB does not invest in Swiss companies and banks. As we discuss in more detail in the moral leadership section, the SNB committed to

divest from coal assets in December 2020. Between June 2020 and December 2020, the SNB reduced the carbon footprint of its portfolio by 10% by divesting from coal companies.[12] Overall, however, the SNB purchases assets according to the market capitalization of issuers, rather than pursuing any active investment strategy. It buys the exact same percentage of available share for each issuer irrespective of considerations of fundamental value, ESG criteria, or any other consideration specific to an active investment strategy. In contrast to the NBIM, the SNB invests in tobacco (Philip Morris and Altria Group), military equipment producers (Honeywell and Boeing) and, as we discuss below, (some) fossil fuel companies.

Shareholder engagement

Unlike the NBIM, the SNB does not engage with companies directly. Until 2015, the SNB also did not exercise its voting rights. Since then, it has outsourced this task to a proxy voting company, which exercise the voting rights. As the SNB explains:

> The SNB exercises its voting rights, focusing on mid-cap and large-cap companies in Europe. For this purpose, it works with external service providers. When voting, the SNB concentrates on aspects of good corporate governance. [13]

Information on the SNB's votes is currently unavailable. Swiss members of parliament have petitioned the government about the lack of transparency of SNB's voting decisions and asked for more information on the SNB's proxy voting practice. [14] These requests are unsuccessful thus far. The focus of proxy voters is usually only on corporate governance issues and does not account for any climate goals in their assessment. The SNB also sets a voting policy for these proxy firms, but it does not give specific instructions for specific votes as the NBIM does.

[12] The companies were Anglo American, Arch Resources, CONSOL Energy, Contura Energy, NACCO Industries and Peabody Energy. More on the portfolio impact in the section on portfolio policy.
[13] See the SNB's Q&A section on investment on its website:
https://www.snb.ch/en/iabout/assets/id/qas_assets_1#t29
[14] See the parliamentary motion presented here
https://www.parlament.ch/en/ratsbetrieb/suche-curia-vista/geschaeft?AffairId=20203619

Moral leadership

The SNB also does not pursue moral leadership. In its public communications, the SNB emphasizes its narrow focus on returns despite, as we saw, a modest role for ESG criteria. When the SNB does take a stand, it seeks to present its position as following pre-existing societal agreement. On 17 December 2020, Chairman of the governing board of the SNB announced the coal divestment. The decision was not announced prominently but rather as part of a large number of monetary policy communications.[15] Moreover, as the SNB explained "In Switzerland, a broad consensus has formed in recent years in favour of phasing out coal. We have therefore decided that we will from now on exclude all companies primarily active in the mining of coal from our portfolios."[16] The justification of divestment was a "broad consensus" in the population, reflecting the reluctance of the SNB to exercise moral leadership.

The impact of the NBIM and SNB investment strategies

Despite their very different strategies, there are major similarities between the SNB and NBIM investment behaviour. Both rely on a highly diversified investment portfolio of publicly traded assets.[17] Although the NBIM describes itself as a long-term investor, a large part of its investments is in highly liquid bonds and publicly traded shares. Out of the 2898 companies owned by the SNB according to Bloomberg, 74% are also owned by the NBIM. So, do the differences in the investment strategy that we described *matter*? We study the impact of their divergent conceptions of environmental responsibilities by looking in more detail at their stock market investments. We do this by considering the three levers of their investment strategy: the portfolio policy, the shareholder engagement and moral leadership.

[15] https://www.snb.ch/en/mmr/speeches/id/ref_20201217_tjn
[16] https://www.snb.ch/en/mmr/speeches/id/ref_20201217_tjn
[17] Note that despite their broad investment, both investors do not invest in some of the most polluting companies in the world, such as large Chinese coal utility companies (Datang Power Generation for example which has some of the largest combined Scope 1,2 and 3 emissions in the world).

Portfolio policy

In this section, we consider the impact of the SNB and NBIM portfolio policy. To this end we analyse the so-called carbon footprint of the corporate ownership of both investors.

The idea of a carbon footprint holds that every investment fund is associated with a specific share of global emissions as a function of their ownership share in individual firms. The Greenhouse Gas Protocol offers guidance on how to calculate the Scope 3 emissions of a corporate entity, which includes public investors (see Bhatia & Ranganathan, 2004).[18] Scope 3 emissions include those of equity and debt investments in the definition of the emissions of a company. This means that emissions from equities owned should be included in the Scope 3 emissions of an investor. The repartition is done depending on the proportion of ownership. Corporate CO2 emissions are typically divided into Scope 1, 2 and 3. Scope 1 emissions are all direct emission. They relate to all the CO2 emitted while running a company (think of the CO2 coming out of the chimneys of a steel manufacturer). Scope 2 emissions include all upstream activities of a company. This is broader and includes all the CO2 needed to produce goods even outside the firm's own operations (think of the electricity needed to run a car-manufacturing plant). Scope 3 concerns emissions from downstream activities. This includes all CO2 indirectly produced by the operations of the company, in our case mainly by providing products to customers (think of the production of oil to fuel a car).[19] The carbon footprint of an investment fund is a function of its ownership share in companies it invests in and the CO2 emissions of these companies (Bhatia & Ranganathan, 2004). To get a sense of the carbon footprint of their portfolio, we give an overview of the emissions for 2020.

Since impact concerns all emissions generated by the firms that a fund invests in, we focus on Scope 3 CO2 equivalent emissions. This gives us the broadest emissions for the firms in the portfolio of the investment funds. Scope 3 emissions, however, are highly concentrated at the world's biggest polluters: fossil fuel companies. By focusing on the top 100 largest Scope 3 CO2 generating companies, our analysis covers a large part of CO2 generated. These companies have

[18] We follow the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard.

[19] This description is somewhat simplified. For more on Scope 1,2 and 3, see (Bhatia & Ranganathan, 2004; Zadek & Schulz, 2010)

generated 71% of global CO2 emissions generated between 1988 and 2015 (Griffin, 2017). Excluded from our analysis are cement producers and agribusiness, which account for a large part of the remaining emissions.

The figure we present here provides a big picture comparison between the footprint of the NBIM and SNB. For one, the Scope 3 footprint reflects a share of global emissions that these investors benefit from, hence acquiring at least some moral responsibility for. The footprint also provides an idea of how much CO2 equivalent emissions the asset managers have at least some control over through ownership. It is by owning these shares that they can influence the behaviours of these companies by either divesting, lobbying the board or investing more. Table 1 and the technical appendix provide the details of how we come to our figures.

Figure 2

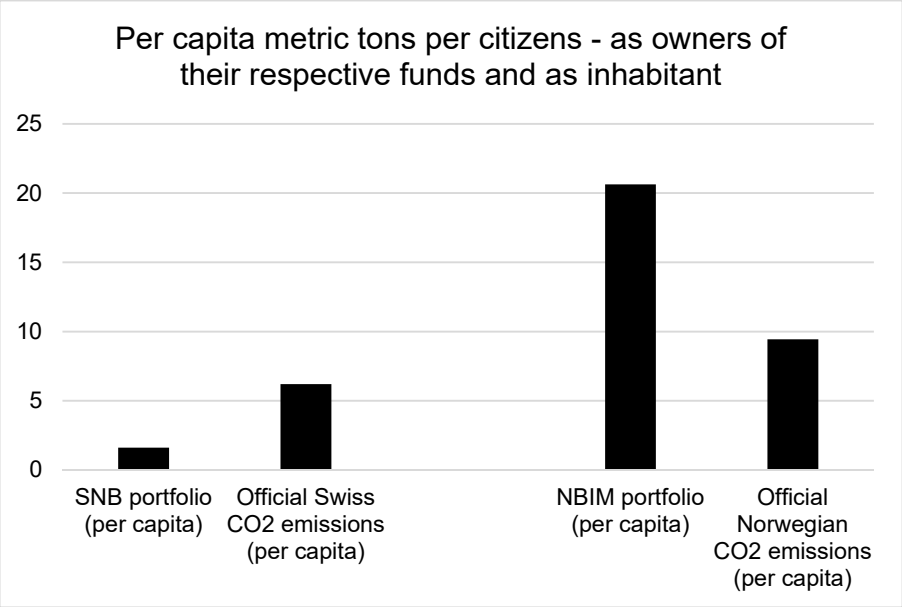


Table 1 gives a detailed overview of the ownership of both investors. The sum of the CO2 equivalent emissions of the investments are huge. To give an idea of the size, the NBIM's Scope 3 emissions are 111 million tons of CO2 equivalent. For the SNB, the sum is 13.9 million tons. Converting these emissions of the public owners to their respective populations gives us a per capita CO2 emission of 20.64 metric tons of CO2 per inhabitant for Norway and 1.61 for Switzerland. How does this compare to the per capita official CO2 emissions figures for each

country? Norwegians generated 9.44 tons of CO2 per person as reported by their statistical office, and Swiss people 6.20. According to this comparison, efforts by citizens of these countries to reduce their carbon footprint are dwarfed by the impact of their public investment funds.[20] Figure 2 shows these orders of magnitude graphically.

What does this data really tell us about the impact of the NBIM and the SNB's investment portfolios? A striking observation is that despite having a more climate-conscious approach, the NBIM has a larger carbon footprint. This contradiction is interesting. It provides us with a first reason to think that Scope 3 emissions of a portfolio are not a measure of impact, and are at best a very inadequate proxy. Consider two limitations.

First, Scope 3 emissions measure the portfolio policy but ignore interactions with the levers of shareholder engagement and moral leadership. If investors use their other levers differently, their impact on the environment is likely to be different. More strikingly, the effective use of the other levers often requires taking a considerable ownership share in the company. The NBIM's higher Scope 3 emissions, accordingly, do not imply that that the NBIM's portfolio policy has an overall more negative impact on the environment. As we will see in more detail below, the NBIM tries to reduce the carbon footprint of the companies it owns through shareholder engagement and moral leadership. For example, as a large investor in BP (close to 5% at the time of our analysis), it will have a much larger say in that company's transition. Strategic shares in companies allow the NBIM to have more of a say.

Conversely, the lower emissions associated with the SNB's portfolio simply reflect a small ownership share in companies large enough to be on an investment index such as the MSCI or S&P500 (the SNB has a share of 0.33% on average in each company). There is no active selection of stocks. The strategy of the NBIM is to focus on the biggest companies and take large shares in

[20] Another way to understand this data is to look at the energy efficiency of the investment. We compare the amount invested in shares with the CO2 output of the equity. The portfolio of the SNB is much smaller than the portfolio of the NBIM. The equity portfolio of the NBIM was 6,729 billion when last reported, and the SNB equity portfolio stands at around 162 billion. The portfolio of the NBIM generated 12,021 metric tons of CO2 per billion invested while the portfolio of the SNB generated 76,446 metric tons of CO2 per billion invested. The Swiss portfolio generated 6.4 more CO2 per billion invested than the NBIM. This comes from the fact that the SNB has very limited restrictions criteria while the NBIM has for example decided to not invest in coal and has clear ethical investment criteria. Despite the ethical restrictions of the NBIM, the fund still generates more CO2 than the whole of Norway.

them. This gives them more leverage when it comes to shareholder policy, as we will see in the next section.

Second, merely owning a company does not impact its strategy, and hence only has an indirect impact. In global capital markets, ownership is dispersed and mediated by the company's corporate governance structures. The portfolio policy, however, can still have impact in different ways. Divestment campaigns can have price impact on the shares of fossil fuel companies. As a consequence of global divestment campaigns, fossil fuel companies' share prices have fared worse than global indices (Dordi & Weber, 2019). However, even if divestment and capital allocation have a price effect, there is little evidence of direct impact on companies and their management (Kölbel et al., 2020).

The choice of scope has a considerable impact on the estimated carbon footprint of the NBIM and SNB. Fahlenbrach & Jondeau (2021) compare the portfolio of the SNB and the NBIM with Blackrock. Their approach is slightly different as they focus on Scope 1 and 2 emissions (while we only focus on Scope 3). By focusing on Scope 1 and 2, utility companies play a major role in emissions, while we capture these same emissions at the level of fossil fuel companies. A simple example helps make this point. We calculate all the potential emission from BP extracting oil and then selling it to customers. For Fahlenbrach & Jondeau (2021) these same emissions are imputed to BP's customers, which are utility companies. Yet these are the same emissions, just captured at a different stage of the product cycle. Both methodologies avoid double counting. Fahlenbrach & Jondeau (2021) also only focus on US equities while we focus on all equities for which we find data. As the NBIM discloses this data, that means all companies. For the SNB, which does not disclose the data, that means their portfolio includes only companies that disclose data either as a matter of policy, or because of regulations coming from bodies such as the SEC. As a result, a large part of our emissions of the NBIM are driven by European and Australian companies (BP, Shell and BHP, which account for 73% of the NBIM's emissions). But we still capture most of the investments in these large fossil fuel companies by the SNB as Table 1 shows. So, our comparison still compares apples with apples. Apart from these few differences, the two papers rely on a similar methodology to assign carbon to the two public investors. Focusing on Scope 1-2 and excluding European shares, Fahlenbrach & Jondeau (2021) find a higher CO2 intensity per million invested for the SNB than the NBIM. By focussing on Scope 3 and including Australian and

European fossil fuel companies, we find higher carbon intensity per million invested for the NIBM. Despite these differences, it remains that both public investors have a large carbon footprint. Our approach focuses more on the idea of transition, which will require fossil fuel companies to change. Fahlenbrach & Jondeau (2021) have a more global approach, looking at all companies.

Rather than focusing on direct impact via market prices, we will highlight the importance of an entirely different channel, namely how portfolio policy interacts with shareholder policy and moral leadership. Divestment is a socially motivated activity. There have been successful past divestment campaigns, and their impact has often been further than just the short-term price impact. They have worked for the Apartheid movement (Arnold & Hammond, 1994; Hunt, Weber, & Dordi, 2017; Kaempfer, Lehman, & Lowenberg, 1987; Teoh, Welch, & Wazzan, 1999) for example, which is one inspiration for the fossil fuel divestment campaigns (Ansar, Caldecott, & Tilbury, 2013). For the South African campaign, it started with religious institutions, then moved on to universities and other public institution before reaching the wider market. If this successful example is to repeat itself, it is obvious that central banks and sovereign wealth funds have a role to play. They can use their position and absence of the profit motive to shift the balance towards the goal of divestment from fossil fuels.

In the 1980s, medical schools in the US divested from tobacco companies, which impacted other investors' views (Wander & Malone, 2004). Another way divestment is visible is the fact that "sin stocks" of companies active in gambling, alcohol or tobacco have higher returns (Hong & Kacperczyk, 2009). The fact that the SNB is still invested in tobacco and arms production companies (as seen above), despite large divestment campaigns, shows that the institution might not want to divest further from fossil fuel companies (despite their coal divestment).

As we will see in our moral leadership argument, there are reasons beyond simple price effects to divest. Divestment can either be used to make the case for shareholder engagement (as we show in the BHP case study), or to show other investors a moral stance to follow (as the NBIM can be seen to do).

Table 1

Company Name	NBIM share in company	SNB share in company	Scope 3 emissions in million tons	NBIM portfolio Scope 3	SNB portfolio Scope 3
Abu Dhabi National Oil	0.56%		163.13	0.914	
BHP Group	4.75%	0.42%	584.9	27.783	2.457
BP	3.07%	0.44%	395.0	12.127	1.738
Canadian Natural Resources		0.42%	65.7		0.276
Chesapeake Energy		0.14%	6.8		0.010
Chevron	1.08%	0.40%	364.0	3.931	1.456
ConocoPhillips	0.11%	0.40%	189.1	0.208	0.756
Devon Energy		0.38%	18.8		0.071
Eni	1.34%		249.1	3.338	
EOG Resources	0.07%	0.39%	8.6	0.006	0.034
Equinor		0.12%	310.1		0.372
ExxonMobil	0.93%	0.40%	275.8	2.565	1.103
Hess	1.24%	0.35%	13.1	0.163	0.046
LUKOIL	0.91%		318.6	2.899	
Marathon Oil	1.28%	0.22%	29.9	0.383	0.066
Murphy USA	1.14%	0.22%	2.4	0.028	0.005
Novatek	1.46%		6.1	0.089	
Occidental Petroleum		0.40%	63.0		0.252
Oil & Natural Gas	0.38%		7.9	0.030	
OMV	0.30%		109.2	0.328	
Ovintiv	0.04%	0.22%	6.1	0.002	0.013
Repsol	1.98%		158.2	3.133	
Rio Tinto	0.09%	0.34%	638.4	0.575	2.171
Royal Dutch Shell	6.24%	0.41%	665.6	41.533	2.729
Southwestern Energy		0.15%	2.7		0.004
Suncor Energy	1.88%	0.43%	2.1	0.039	0.009
Teck Resources	1.08%	0.37%	82.8	0.894	0.306
Total	2.46%		404.6	9.953	
Vistra Energy	0.53%	0.36%	15.6	0.083	0.056
SUM				**111.0**	**13.9**

Shareholder engagement at the NBIM, a divestment case study: BHP – carrots and sticks

So what about the second lever: shareholder engagement? As we have seen, there seems to be no direct link between the exposure to Scope 3 CO2 of these investors and their climate policies. It is also unclear that the mere fact of owning a share sways emissions of a company in one direction or the other. Yet, share ownership also allows investors to exercise voting rights and other forms of engagement.

Evidence of the impact of shareholder engagement is hard to find. By definition, shareholder negotiations happen behind closed doors. It is in the interest the investors not to publicly attack the company they own. And it is in the interest of the board not to have shareholder dissent. This setup means that if the board knows that historical shareholders will not divest nor vote against the board, they have an incentive not to change things. For one, as investors they can seek to change company behaviour by making specific requests: empirical estimates of success rates range from 18% to 60% (Kölbel et al., 2020). Engagement also makes sense from a narrow return focus, as it can reduce investor risk (Hoepner, Oikonomou, Sautner, Starks, & Zhou, 2021). Funds practicing engagement and other active ESG strategies beyond just negative selection face lower ESG risk (Folqué, Escrig-Olmedo, & Corzo Santamaría, 2021). Goodman, Louche, van Cranenburgh, & Arenas (2014) look at religious organisation investment. They show that these organisations use voice (engagement) as well as exit (divestment). And that even after divesting, these investors often continue to use their voice to share concerns. Also, even after successful engagement, religious investors sometimes still choose divestment. Gifford (2010) finds that engagement works best when backed by a strong business case. He also finds that the values of the managers of investee companies have an influence on companies.

The NBIM and the SNB make very different use of voting rights and their investor relationships to influence the corporate strategy of firms they have invested in.

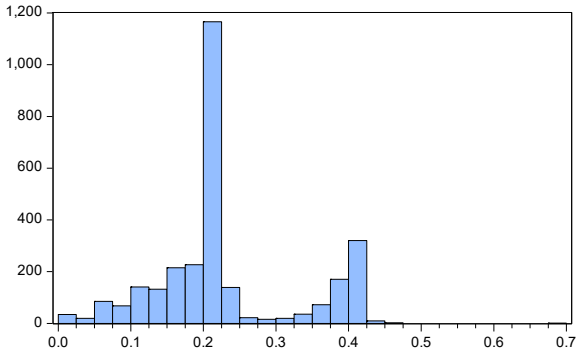
As a consequence of its market neutrality policy, the SNB does not engage in active shareholder engagement to influence corporate strategy or submit shareholder proposals.[21] We already saw that it outsources its voting to a proxy voting company providing it with some guidelines, but

[21] https://www.ngfs.net/sites/default/files/medias/documents/ngfs-a-sustainable-and-responsible-investment-guide.pdf

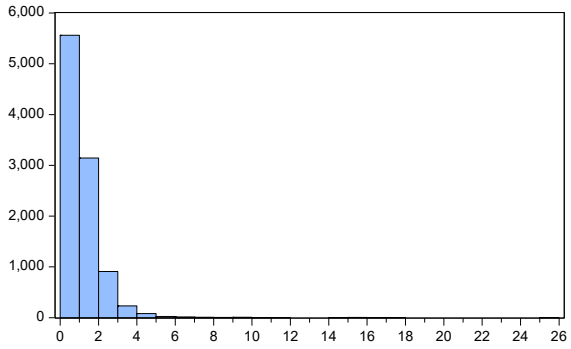
refrains from voting on issues besides corporate governance. The SNB also does not have any strategic voting share, as seen in Figure 3 below (notice the scale from 0 to 0.5% for the SNB, and from 0 to 25% for the NBIM). Its ownership in companies is rarely higher than 0.40%. While the SNB receives an invitation to the shareholder meetings, the SNB's positions are unlikely to sway the board in one direction or another.

Figure 3

SNB ownership % distribution



NBIM ownership % distribution



Note: Distribution of the ownership percentage of the NBIM and SNB. Data from Bloomberg, accessed in January 2022. Includes 2898 companies (out of 6700) for the SNB and 9994 for the NBIM (likely exhaustive list).

The NBIM on the other hand does make active use of shareholder engagement, which can potentially influence corporate strategy in impactful ways. It has an active policy of shareholder engagement meeting with companies it is invested in, writing to 650 companies to voice their concern and voting at almost every shareholder meeting it is invited to.[22] It holds strategic ownership of up to 25% of a company. This also applies to fossil fuel companies. NBIM owns 6.24% of Shell, 3.09% of BP and 4.75% of BHP (see Table 1 and more on BHP below). These companies would likely consult NBIM before any large strategic decision and make sure that they are likely to support it at a shareholder meeting. Beyond size of investment, the volatility of the NBIM as an investor also incentivises companies to listen. The SNB mostly holds onto shares of a firm, increasing ownership progressively as the currency reserves grow. The NBIM on the other

[22] https://www.nbim.no/en/publications/reports/2020/responsible-investment-2020/

hand invests, divests and reinvests, as we show later for the BHP case. This provides firms with more incentive to listen to the NBIM's shareholder engagement.

The NBIM has in fact voted relatively frequently against the board of the companies they own, showing a certain independence. Although it takes the view that its "default position when voting is to support the board", the NBIM has followed shareholder proposals against the board's recommendation in over 12% of cases (NBIM, 2020b, p. 34). In 6% or less of the cases, they have also voiced their concerns when it comes to board nominations, remuneration or issues of protection of shareholders. However, the NBIM does not support all climate-related shareholder initiatives, as the recent shareholder proposal of the hedge fund Engine No. 1 illustrates. Engine No. 1 is a small activist hedge fund that seeks to lobby large companies into change with their investments, while providing positive returns. In a recent high-profile case of new board nomination at ExxonMobil, the hedge fund successfully suggested three new board members, arguing that ExxonMobil was lagging behind other companies in the sector with regard to research and development of greener technologies. The shareholder proposal was meant to push for ExxonMobil to engage in the transition. Despite of the lack of support from NBIM, the new board members were elected. The NBIM did not communicate why it refused to follow the shareholder motion on this issue (it only communicates reasons for voting against the board, not against shareholder proposals). It did however refrain from voting for the CEO as president of the board, as it goes against its view of separating the CEO and chairman jobs.

Potentially the most powerful tool of shareholder engagement is the NBIM's observation and exclusion list, which serves to threaten firms into complying with its demands. Companies can either be placed on the exclusion list and the NBIM will sell all assets of that company, or on the observation list, and the NBIM will monitor a given company before deciding on whether to divest from it. Companies on the observation list can still mend their ways and be removed from the list, which is what happened in the BHP case.

Although we as of yet lack a way to quantify the impact of this lever, we study one successful use to give the reader a sense of its effectiveness. To this end, we present evidence of an active engagement case involving the BHP Group plc. BHP is an Anglo-Australian global mining and petroleum company headquartered in Melbourne, and it is the world's largest mining company. It

was partly involved in coal, which is on the NBIM's exclusion list. We analyse the strategies the NBIM used regarding BHP to assess both the engagement and the threat of divestment strategies of the NBIM and their impact.

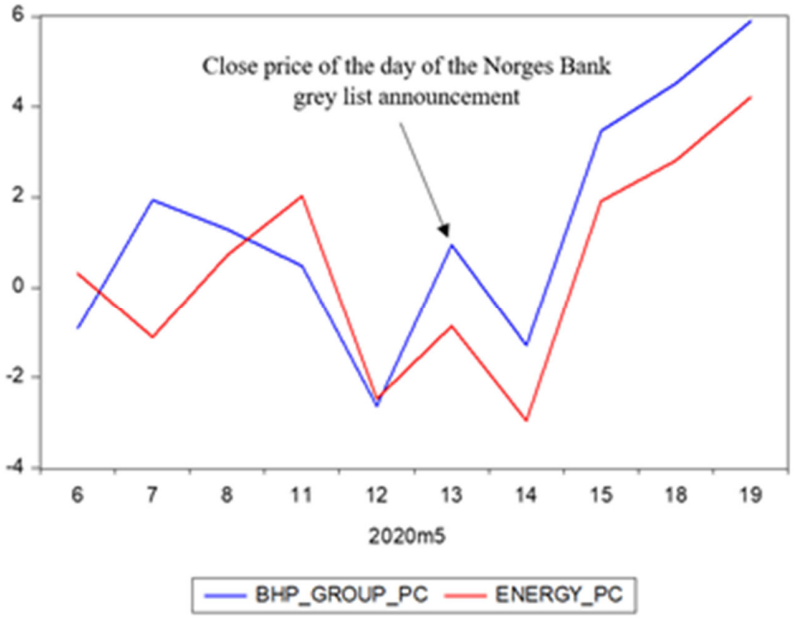
The strategy that informs the NBIM's observation and exclusion list can be understood as one of the carrot (more investment) and the stick (divestment or the threat of it). On 13 May 2020, the NBIM announced that it would put BHP on its observation list.[23] At this point, the NBIM was a major shareholder of BHP, holding between 4 and 5% of the company.[24] The reason for adding BHP to the list was because of "an assessment against the product-based coal criterion".[25]

To see if the NBIM's action had any specific impact on BHP, we compare the share price of BHP with an index for all Australian energy sector equities. The BHP stock price is affected by information that is specific to BHP, but also by information with a more general economic significance for the energy sector and the general economy. By considering the changes to the BHP stock price relative to changes in prices for all Australian energy equities, we approximate the impact of the news that is specific to BHP on the share price. Accordingly, we compare the daily percent change in BHP share price with the daily percent change of the Australian ASX 200 Energy index. This index represents the share movement of the 11 companies in the S&P/ASX 200 that are classified as members of the GICS Energy Sector. Like BHP, companies in this index focus on mining and fossil fuel extraction.

Looking at the percentage change of both BHP and the Energy index in Figure 4, there seems to be no impact from the NBIM announcement. If anything, on that day, BHP outperformed its competitors in the stock market, and the same happened on the following days (the reading is in percentage, so days can be compared like for like).

[23] https://www.nbim.no/en/the-fund/news-list/2020/exclusion-and-observation-of-coal-companies/
[24] This is based on a report made to the Australian Securities Exchange by BHP. In a February 2020 report, the NBIM owned 4% of BHP. By July 2020, NBIM owned 5% of BHP.
[25]https://www.nbim.no/en/the-fund/news-list/2020/exclusion-and-observation-of-coal-companies/

Figure 4 - BHP vs other similar Australian firms



The divestment threat is not showing any clear-cut impact on the share price. However, this does not mean that NBIM had no impact behind the scenes. This strategy by the NBIM likely have an impact. Slager & Chapple (2016) have shown that firms faced with the threat of divestment are more likely to react positively to shareholder engagement. Rimmer (2016) noted that in 2014-5 BHP was "nervous about the review" about fossil fuel divestment.

NBIM shareholder engagement not only involved the stick of divestment but also the carrot of investing more. The timeline below in Figure 5 helps clarify the chain of events. A month after being placed on the grey list by one of its major shareholders, BHP decided to sell a coal mine that it owned. Less than a month after that, NBIM increased its investment in BHP. By 15 July, it was publicly announced that NBIM owned 5% of BHP (versus 4% on the last public announcement). The investment constituted a clear endorsement of the company's policy, just after having been put on the grey list. Since February 2020, NBIM only had a share between 4 and 5%.[26] The increase to 5% ownership was made on 15 July, communicated to BHP on 16 July and made public on 17 July. By this point, investors would have learned that despite being on the NBIM grey list, the NBIM increased its share in BHP. This was surely positive news for the company's management

[26]https://www.listcorp.com/jse/bhp/bhp-group-plc/news/notification-of-major-interest-in-shares-2409921.html

as well as other shareholders. The grey list was an implicit commitment of a potential divestment by a major shareholder. By announcing publicly its increased stake in the company, NBIM reassured investors of its intentions.

Figure 5 - BHP investment and divestment timeline

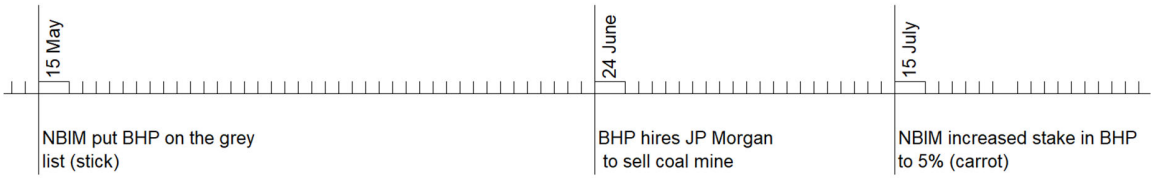
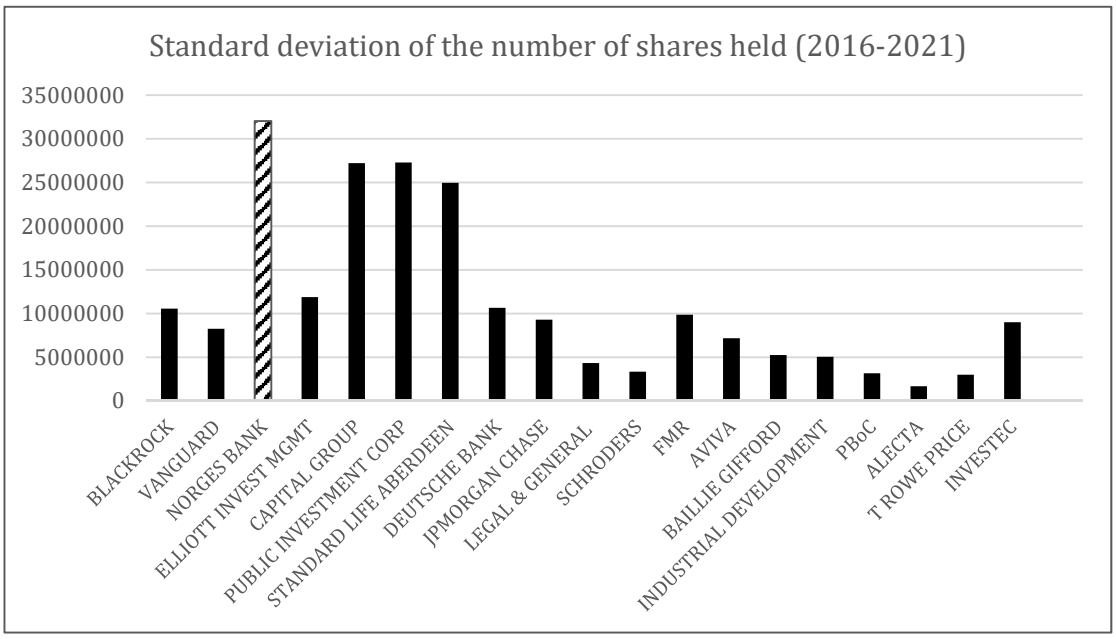


Figure 6

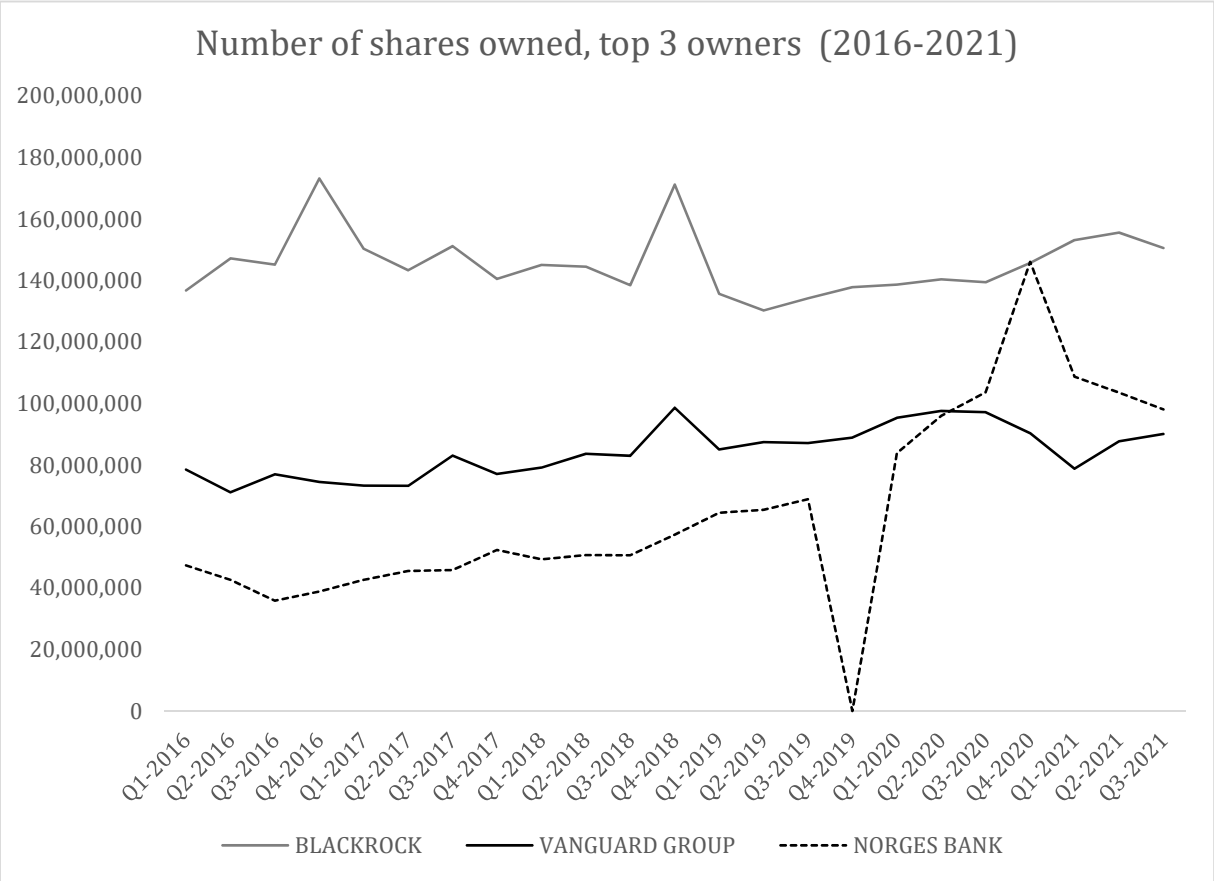


Note: data from Bloomberg.

NBIM's behaviour in the years leading up to the case add to its ability to exercise influence. The NBIM is the investors that displayed the most variance in the number of shares held among the top 20 investors (see Figure 6). In other words, the NBIM is the investors that bought and sold the

largest number of shares in the period. While Blackrock and Vanguard have on average over time been larger investors, they almost never sold or bought BHP shares in large quantities. Therefore, the board of BHP likely politely listened to shareholder engagement by the two large investors. Yet, these investors had no credible threat. Blackrock could not suddenly tell its customers that its Exchange Traded Fund (EFT) would now contain all assets of a certain category except for BHP. Customers would probably have moved their business to the competition.

Figure 7



The NBIM, with no customers to answer to, can easily divest, which it did. Between 2008 and 2021, the NBIM sold all or most of its shares in BHP three times. Figure 7 below also highlights how the NBIM has more leverage than the two other top-3 investors. NBIM went from having no shares in BHP in Q4 of 2019 to being the largest shareholder of BHP in Q1 of 2021. In Figure 7, most of the movement by Blackrock and Vanguard is due to the relative importance of BHP in

various indices (say the Australian ASX 200 or an equivalent of the MSCI World, for example). This explains the noticeable co-movement between the two investors in Figure 7. The variation in the holdings of the NBIM depended fully on how happy it was with the management's behaviour and compliance with its shareholder engagement.

Moral leadership

Public investors have a direct impact on firms via their portfolio and shareholder policies, but they also have an indirect impact via other investors. As we saw, by setting a lower benchmark and giving guidance on what counts as ethical to private actors, public investors can have a sizable impact. This impact is hard to measure, and for now we have only limited evidence on how it works. During the Apartheid divestment of the 1980s, which contributed to the election of the ANC in 1994, public investors were among the second wave of investors to follow the divestment campaign, just after religious organisations (Ansar et al., 2013). Arguing along these lines, investors can contribute to establishing anti-fossil fuel norms which could help the transition (Green, 2018).

The SNB and the NBIM both engage in moral leadership but do so in different ways. The SNB is not trying to lead but rather presents itself as actively following moral norms. In a press interview, Andréa Maechler of the Governing Board stressed this position which made the SNB avoid having to make difficult moral decisions.[27] There is therefore no willingness for the SNB to lead market actors and provide guidance. The SNB sees itself as one market actor among many and does not think that its size or public status is a reason for other investors to look up to it. It is simply a bank among other banks. In this way, the SNB's policy of market neutrality signals a highly restrictive conception of what investors should do. The SNB engages in passive moral leadership in the sense that it models a certain way of investing, but it does not use it as an active tool for impact. Instead,

[27] Journalist: "If I am an investor listening to you tonight, Andrea Maechler, I will think that I should maybe invest in renewable technologies instead of risky fossil fuels?" […] Andrea Maechler: "We manage our portfolio passively and only replicated reference indices" […] "This is a much more pleasant stance than having to choose which sectors to favour." Interview in French available here https://www.rts.ch/audio-podcast/2021/audio/la-gestion-de-la-crise-du-franc-fort-de-la-bns-interview-d-andrea-maechler-25782061.html

it promotes a relatively low baseline of what investments are permissible and a narrow focus on profits.

This contrasts with the NBIM's prominent and visible role as an ethical investor. As we already noted, investment decisions by the NBIM are often commented on and followed closely in the press. In December 2020, the fund communicated that it would announce all of its voting decisions five days before the board meetings.[28] They planned to provide explanations of their votes when these go against the board. While this policy has an impact on shareholder engagement, it is really meant to offer moral leadership to other investors. Other investors can then decide to follow the voice of the NBIM, or decide on their own. It also offers guidance for investors who do not have time to look into the corporate issues, such as retail investors. The impact of this lever is even stronger, since the position of the NBIM as a climate-friendly investor is public knowledge. Following the NBIM therefore makes sense for any climate-conscious investors. The NBIM also offers moral leadership on how to be a *public* investor: If the SNB would one day decide to adopt an active investment strategy, it is easy to see why one would think that the NBIM had a role in that.

The NBIM's decision to divest from coal has been recognized as a case of moral leadership (Rimmer, 2016). After the Norwegian government announced initial plans to make some investments in renewable energy, they fell short of expectations. The CEO of the WWF in Norway replied in disapproval with the following statement: "Norway can make a huge difference in the world...this announcement falls short of meeting expectations of the people of Norway and of the world" and that "every decision Norway makes on this fund sends signals around the world" (WWF CEO, quote from Rimmer, 2016, pp. 211–212). This statement shows that for the WWF, moral leadership is what matters when it comes to public investment. And moral leadership has been at the center of Norway's debate around investments. The Norwegians' investment decisions alone do not impact global greenhouse gas emissions, it is also the perception of the global investment and broader community that matters. Following the coal divestment campaign, there

[28] https://www.nbim.no/en/the-fund/responsible-investment/our-voting-records/

was news coverage stressing that the NBIM decisions could have global consequences for the investment community.[29]

The NBIM's engagement with BHP provides some anecdotal evidence of the impact of its moral leadership. In November 2021, BHP held a vote on a new climate action plan and shareholders had to decide to vote for or against it. A month before the vote, shareholders were still undecided. They wondered whether they should make a net zero commitment, which might have drastic consequences for a company basing a large share of its revenues on mining. The *Financial Times* had reported that many top-30 shareholders were concerned about the plan. They reported a top shareholder saying that the vote would be "quite split".[30] Against this background of uncertainty, the NBIM used its moral leadership to back the policy. The fact that it was one of the largest investors in BHP also gave more weight to this decision. A month later, the motion was finally accepted by 86% of shareholders. Although we cannot measure the exact impact of NBIM, as a top-3 shareholder, its announcement early on could have had significant impact on BHP strategy.

The BHP case is, moreover, not an isolated example. In May 2020, NBIM announced a partial divestment from Glencore, Anglo American and RWE, motivated by its coal exclusion criteria. Like in the BHP case, the divestment itself most likely had limited price impact. Divestment was done over a long period of time and in accordance with the NBIM's aim of avoiding market disruption. Yet, likely affected the perception of other investors. The *Financial Times* wrote the following: "Exclusions by one of the world's biggest shareholders [...] are often closely followed by other investors."[31] In these contexts, the NBIM acts as a benchmark setter against which other private companies need to define themselves. You can either be "as good as the NBIM" or "worse than the NBIM". They can either follow the NBIM or explicitly decide not to.

Conclusion

In this paper we analysed three ways public investors can impact markets and companies: portfolio policy, shareholder engagement and moral leadership. We used this theoretical framework to analyse the climate impact of the Norges Bank Investment Management (NBIM) and the Swiss

[29] https://www.theguardian.com/environment/2015/may/28/norway-fund-could-trigger-wave-of-large-fossil-fuel-divestments-say-experts
[30] https://www.ft.com/content/c7c1c225-9178-4fd5-8db1-4a86450d8f3d
[31] https://www.ft.com/content/ca33f62e-242a-4304-9895-f7cea36a497e

National Bank (SNB). The two public investors have diametrically opposed approaches to investment. The NBIM is an active investor, which tries to generate positive outcomes to stop climate change while aiming for positive returns on its portfolio. The SNB also aims for positive returns, but holds that the market and governments alone should act against climate change.

Portfolio policy does have price impact, but rarely changes company behaviour. When it comes to their carbon impact, we find that the NBIM has a carbon footprint ten times that of the SNB. Yet, despite this large footprint, it is clear that the NBIM does more to mitigate the dramatic consequence of climate change. The most effective uses of the portfolio policy, we suggested, are those that make share purchases conditional to shareholder engagement and moral leadership. Shares should be bought with the goal to have an impact on a company.

Shareholder engagement includes the use of ownership of securities to influence a company's strategy. The NBIM engages with the companies it invests in, while the SNB abstains from it. We showed how the NBIM used two tools. Instead of spreading its investment on all firms, it focused on some firms and took a strategic participation as shareholder, not just a minority participation. Then, it also used the credible threat of divestment to make the management board comply. As we showed for the BHP case, the NBIM made demands for the sale of coal assets to BHP, after having already divested from BHP three times in the past. This made their engagement much more successful than the engagement of historical shareholder that had never divested from BHP. Being a top-3 BHP shareholder (and the largest at one point) also made the NBIM's demands heard.

Finally, a third way for public investors to have an impact on climate change is moral leadership. This channel has not been as clearly identified in previous literature. And it is especially relevant for public investors, as they do not exclusively have a profit motive. Other public and private investors look up to large public investors such as the NBIM and SNB to make their investment decisions. The NBIM uses this tool to try to make the balance shift around important shareholder votes at Annual General Meetings, by making its voting intention known three days beforehand.

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Appendix

Scope 3 calculations

This appendix provides the detail of how we built table 1. The data on ownership comes from Bloomberg and the data for CO2 emissions is from self-reported sources, either the Carbon Disclosure Project (CDP) or the companies' own websites. When the data is missing, we run extrapolations for 19 (mainly smaller) of the 40 companies. 93% of the CO2 figure in Table 1 comes from self-reported data. For the remaining 7%, mainly for smaller companies, we run some extrapolations based on Scope 2 emissions and number of employees.[32] The detail of the extrapolations is explained in the appendix but it only marginally changes the headline figures. Excluding any extrapolation yields results of similar magnitude.

Most of the CO2 data comes from 2018 when we found available CDP data and share ownership data is from February 2020.[33] This reflects both the latest CDP we had access to and the most recent ownership data at the time of writing. As CO2 emissions have likely increased on average since the reporting in 2018, this will only make our estimates biased downward. All our data is from before the Covid crisis which likely temporarily reduced emissions. Also note that our data is a snapshot before the SNB announced its decision to divest from coal.

Extrapolation of Scope 3 data

We run some extrapolation for the sake of completeness for companies for which we do not have Scope 3 CO2 emissions data. Note that these extrapolations only marginally change the headline figure we present in the paper, but for transparency we show the extrapolations here. They are not meant to be perfect estimates but to help give an idea of the Scope 3 emissions of all the companies out of the 100 largest CO2 emitters who generated around three quarter of global greenhouse gases emissions.

[32] Note that using only self-reported Scope 3 CO2 and no extrapolation generates similar results (74.91 for NBIM and 11.55 for the SNB).

[33] The data was collected on Bloomberg in June 2020 and includes a range of reporting dates but mostly 31/12/2019 and 31/03/2020, two quarterly reporting dates. Note that some companies on the list are no longer in existence today. Chesapeake Energy, a former US shale gas producer, declared bankruptcy in July 2020 following a sharp decline in oil demand due to the Covid-19

We pick four potential candidates which correlate with Scope 3 CO2 emissions: Number of employees, market capitalization, Scope 1 and 2 CO2 emissions. We then test how well they explain Scope 3 emissions for companies in our list where we do have both Scope 3 and of these four correlates. Then we extrapolate the data based on the best explanatory variable. We only have Scope 1 and 2 emissions data for some companies but market capitalization and number of employees are readily available public information

Table 2 is a correlation matrix showing the correlation of various potential candidates to extrapolate Scope 3 data when it is missing. Both Scope 2 and number of employees correlate with Scope 3 emissions with a relatively high correlation coefficient.

Table 2

	Correlation with self-reported Scope 3 emissions
Self-reported Scope 2 emissions	0.77
Number of employees	0.72
Market capitalisation	0.60
Self-reported Scope 1 emissions	0.30

Based on the simple correlations in table 3, Scope 2 emissions seem to correlate best with Scope 3 emissions. To test which would best explain the variation in Scope 3 CO2, we also run a "horse race", where we test which one of these factors has the highest explanatory power for Scope 3 emissions, using the R squared as a measure of fit.

Table 3

Explanatory variable	Dependent variable: self-reported Scope 3 emissions	R squared
Self-reported Scope 2 emissions	33.10 (12.41)**	0.47
Number of employees	2966 (1169)**	0.37
Market capitalisation	1,475,069 (758,643)*	0.21
Self-reported Scope 1 emissions	1.53 (1.05)	0.09

Based on the horse race in table 3, Scope 2 is probably the best predicator for Scope 3 CO2 emissions as it shows the highest R squared and as the coefficient has the lowest standard error. An increase in 1 ton of Scope 2 CO2 is associated with 33.1 additional tons of Scope 3 CO2 a company generates. We use this for all the companies for which we have no self-reported Scope 3 data. When no Scope 2 data is available, we use the second-best predicator, number of employees. Using number employees for all companies with missing data only marginally changes the results as the companies with the largest emissions have reported Scope 3 CO2 data.

Table 4

Company Name	Reporting year	Scope 1	Scope 2	Scope 3 source
Abu Dhabi National Oil		n/a	n/a	employees extrapolation
Anglo American	2018	CDP	CDP	CDP
Apache	2015	CDP	CDP	Scope 2 extrapolation
Arch Resources	2019	Company website	Company website	Scope 2 extrapolation
BHP Group	2018	CDP	CDP	CDP
BP	2017	CDP	CDP	CDP
Canadian Natural Resources	2018	CDP	CDP	Scope 2 extrapolation
Chesapeake Energy		n/a	n/a	employees extrapolation
Chevron	2017	CDP	CDP	CDP
ConocoPhillips	2018	CDP	CDP	CDP
CONSOL Energy	2018	CDP	CDP	CDP
Contura Energy		n/a	n/a	employees extrapolation
Devon Energy	2018	CDP	CDP	Scope 2 extrapolation
Eni	2018	CDP	CDP	CDP
EOG Resources	2018	n/a	n/a	employees extrapolation
Equinor	2018	CDP	CDP	CDP
ExxonMobil	2017	CDP	CDP	CDP
Glencore	2017	CDP	CDP	CDP
Hess	2018	CDP	CDP	CDP
Inpex	2018	CDP	CDP	CDP
LUKOIL		n/a	n/a	employees extrapolation
Marathon Oil	2012	CDP	CDP	Scope 2 extrapolation
Murphy Oil		n/a	n/a	employees extrapolation
NACCO Industries		n/a	n/a	employees extrapolation
Noble Energy	2017	CDP	CDP	CDP
Novatek	2016	CDP	CDP	Scope 2 extrapolation
Occidental Petroleum	2018	CDP	CDP	CDP
Oil & Natural Gas	2011	CDP	CDP	Scope 2 extrapolation
OMV	2018			CDP
Ovintiv	2017	CDP	n/a	employees extrapolation
Peabody Energy		n/a	n/a	employees extrapolation
Repsol	2018	CDP	CDP	CDP
Rio Tinto	2017	CDP	CDP	CDP
Royal Dutch Shell	2018	CDP	CDP	CDP
RWE	2018	CDP	CDP	CDP
Southwestern Energy		n/a	n/a	employees extrapolation
Suncor Energy	2018	CDP	CDP	CDP
Teck Resources	2018	CDP	CDP	CDP
Total	2018	CDP	CDP	CDP
Vistra Energy		CDP	n/a	employees extrapolation