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PORTFOLIO DECARBONISATION STRATEGIES: QUESTIONS AND SUGGESTIONS

by Paolo Angelini*

Abstract

Financial intermediaries are integrating climate in their portfolio management and lending strategies. A shared objective is to properly manage the related risks. Many are also driven by the desire to do their part to help the transition towards a low-carbon economy. In their efforts to pursue these two objectives, many intermediaries have been pledging to reduce the carbon emissions financed by the assets side of their balance sheets, and to achieve net zero financed emissions by 2050, possibly meeting intermediate quantitative targets. Divesting from carbon-intensive firms and investing in low-carbon ones should reduce transition risk (the first objective), and should make access to finance more difficult for high emitters, pushing them to curtail investment in polluting technologies (the second objective). This paper argues that this strategy, apparently simple and sensible, hides numerous complexities whose implications have not yet been fully fleshed out, and that some of its consequences might be undesired. In a nutshell, in spite of substantial progress in recent years, more research is necessary to shed light on how the financial sector can effectively pursue the above objectives.

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1. Introduction[§]

An increasing number of financial intermediaries (banks, insurance companies, pension funds, asset managers) are integrating climate considerations in their portfolio management and lending strategies, following standards and frameworks promoted by various bodies and investors' coalitions.¹ Among the drivers of this trend is the fact that many jurisdictions adopted climate change legislation and targets for emissions reduction (Merner et al., 2024). These financial actors pursue two broad sets of objectives. First, they wish to properly manage the climate-related (physical and transition) risks of their financial assets, as they would do with any other risk. Second, many are interested in doing their part to ensure a smooth and credible transition to a low-carbon economy. With a few qualifications, central banks and supervisors broadly share the same objectives; in particular, their mandate for micro and macro-financial stability leads them to worry that financial intermediaries actively pursue the first objective.²

In their effort to pursue these objectives, many intermediaries have been pledging to reduce the carbon emissions financed by the assets side of their balance sheets (debt instruments, equity, loans) and to achieve net zero financed emissions by 2050, possibly adding intermediate quantitative targets.³ Divesting from carbon-intensive firms and investing in low-carbon ones should reduce transition risk (the first objective). Also, it should make access to finance more difficult for the former and easier for the latter; this should help bring about the climate transition, in particular, by pushing high emitters to curtail investment in polluting technologies.

This paper argues that this strategy, apparently simple and sensible, hides numerous complexities whose implications have not yet been fully fleshed out, and that some of its consequences might be undesired.

First, shifting finance towards low emitters is unlikely to do much good, as their emissions are low already. Unless, of course, this finance is invested in technologies capable of transforming highly

§ I am indebted for useful comments to M.A. Aiello, E. Bernardini, L. Carpinelli, P. Cova, I. Faiella, M. Fanari, S. Letta, F. Natalucci, P. Pagano, F. Panfili, T. Perez, L.F. Signorini, M. Taboga. All errors are mine.

¹ See e.g. González and Triebkorn (2023) for a summary of the main initiatives in recent years.

² The two objectives need not be independent. While the first one (risk management) is standard for every investor, differences persist across jurisdictions on the second, driven by legal frameworks and political sensitivities. For instance, the EU law assigns a primary mandate of price stability to the European System of Central Banks, but also a secondary mandate to support the economic policies of the EU, provided this is done without prejudice to the primary mandate. This secondary mandate clearly includes climate policies. As a result, financial intermediaries in the EU face relatively greater regulatory pressure to contribute to the transition.

³ For instance, Asset Owner Alliance (2023) proposes intermediate targets at a five year frequency, as well as added frameworks for carbon accounting of sovereign debt, private assets and direct commercial real estate mortgage loans.

polluting production processes into low emission ones. Also, making finance more expensive for high emitters may induce them to stick to their less capital-intensive polluting technology. These considerations suggest that naïve decarbonization strategies, i.e. those that aim to achieve a given decarbonization target by shifting the portfolio composition away from high emitters and towards low emitters, may not lead to real-world decarbonization, or effective transition risk mitigation. They also suggest a revision of the standard notion of green vs brown firms: green firms should include not (only) low emitters, but also “virtuous” high emitters, i.e. those who ambitiously and credibly work toward cutting their emissions.

Second, many high emission products and services (energy, steel, cement, shipping, aviation, etc.) are indispensable inputs to the world economy as we know it, and are difficult/costly to replace. Making access to finance harder for these sectors may cause a supply shortage, unless accompanied by a concomitant increase in supply from clean sources/technologies. The recent gas crisis triggered by the Ukrainian war bears witness of the undesired consequences of a shortage: European governments rushed to subsidize energy consumption; public deficits surged; coal-fired power plants went back into operation, although hopefully only temporarily.

Third, there is a need for greater clarity on the relationship between decarbonization targets and the traditional objectives of investment: risk, return, liquidity. The theoretical literature indicates that the responsible investor should be willing to sacrifice these objectives for sustainability. To my knowledge, to date few if any financial intermediaries adopting net zero pledges have been explicit about this trade-off. Publicly committing to a net zero target might at some point force the responsible investor to choose between accepting portfolio underperformance, no matter how large, and abandoning the target. Furthermore, the efforts of responsible investors could be thwarted by opportunistic investors focused solely on the risk-return paradigm. In other words, there could be a transfer of returns from responsible to opportunistic investors, with no net effect on real world decarbonization.

Fourth, investors embracing portfolio decarbonization targets need to be wary of carbon leakage. There is evidence that firms divest highly polluting plants to buyers facing weaker environmental pressures. The former benefit from higher ESG ratings and lower compliance costs, but there are no real improvements on pollution levels. This implies that sustainability-conscious investors may need to distinguish between operations driven by genuine industrial considerations and those mainly driven by the objective to improve sustainability indicators.

A final issue concerns reputational and legal risks. Investors who commit to achieve certain decarbonization targets may be reluctant to walk back for fear of reputational damage regardless of the effectiveness of the strategy, which is largely untested. Also, they may face litigation risk from

various stakeholders, should they undermine their investment objectives or miss the climate-related targets.

In conclusion, in spite of substantial progress in recent years, more research is necessary to shed light on the desirability and the effectiveness of portfolio decarbonization pledges by financial intermediaries and, more generally, about how the financial sector can effectively manage climate risks and contribute to economic sustainability. The rest of the paper elaborates on the above themes. It concludes by pointing out avenues for investors that may hold promise.

2. Problems of naïve portfolio decarbonization targets

Portfolio strategies envisioning decarbonization targets seem a relatively sensible and simple way for financial intermediaries to do their part to mitigate transition risk and promote the transition. However, simplicity is only apparent.

A key issue pertains to the way a given portfolio decarbonization target is achieved. Clearly, shifting the portfolio composition away from high emitters and towards low emitters is an easy option, and indeed, it appears to be the predominant one.⁴ But this may not lead to real-world decarbonization, or effective transition risk mitigation, for at least two reasons.

First, shifting finance towards low emitters is unlikely to do much good, as their emissions are low already. Unless, of course, this finance is invested in technologies capable of transforming highly polluting production processes into low emission ones. But while in principle nobody prevents any low-emission firm to invest in (say) a plant producing energy from renewable sources, in practice a substantial contribution should be expected from the high emitters in the energy sector, as their large scale of operations and ample profits allow them to shoulder the huge investment required for the transition. Also, these firms should have the incentive to invest in clean technologies, purely based on a (risk) diversification argument. Concerning transition risk, consider two otherwise identical firms, characterized by sharply different investment plans – one with aggressive investment in green technologies, the other doing business as usual. Clearly, they will carry completely different transition risk.⁵

⁴ See e.g. Atta-Darkua, Glossner, Krueger and Matos (2023), Goldman Sachs (2023).

⁵ See Shaw and Donovan (2021) for a more detailed explanation of the reasons why the carbon footprint is a poor proxy for a firm's transition risk, and for a discussion of an alternative method to discriminate among firms in the fossil fuel sector. Carbone et al. (2021) find that firms with high emissions tend to have higher credit risk, but disclosing emissions and setting a forward-looking target to cut emissions are both associated with lower credit risk.

The above reasoning carries over to firms in any high emitting sector, and indeed, there is some evidence that firms in these sectors do plan significant emissions reductions (Angelini, 2022). Unfortunately, so far investment by high emitters in emission-saving technologies has been grossly insufficient, as discussed below. However, it is not obvious that this problem can be cured via finance. Some authors argue that higher pressure by investors will encourage decarbonization by raising the cost of finance for high emitters,⁶ but the opposite argument has also been made. Hartzmark and Shue (2023) argue that sustainable investing that directs capital away from “brown” firms and toward “green” firms makes the former more brown without making the latter greener. The argument is a powerful one. Think about an energy producer relying on fossil fuels, but considering the adoption of a renewables-based technology. Faced with increased difficulties in funding, the firm may well decide to stay with the brown technology. This conclusion is strengthened by two observations: (i) renewables-based productions tend to be much more capital intensive than those based on fossil fuels; hence a firm considering a green upgrade to its fixed capital needs access to relatively more finance;⁷ (ii) on average, firms with high emission intensity relative to industry peers are older, have an older stock of fixed capital, are less efficient and innovative, and adopt worse management practices (Capelle et al., 2023); hence they already stand to face relatively difficult access to external finance.

A second reason why cutting finance to high emitters may not be effective is that this strategy implicitly assumes that we can do away with their products. But this idea is misguided. Many high-emission products and services are indispensable inputs to the world economy as we know it, and also for firms producing green technologies. Think first and foremost about energy, but also steel, cement, shipping, aviation, etc. Such products are difficult/costly to replace, as no close substitutes are readily available. As a consequence, their demand elasticity is generally rather low, especially in the short-term (well below one).⁸ I shall call these “necessity” goods. A strategy of shifting a portfolio composition away from high-emission firms producing such goods and towards low emitters, if applied rapidly and on a vast scale, would suffer from a fallacy of composition: it would be feasible for the individual intermediary, but not at the aggregate level, short of a technological breakthrough allowing carbon intensive firms to transition without financial support, or a quick and radical drop in the demand for carbon-intensive products and services.

⁶ De Angelis et al. (2021); Rohleder et al. (2022).

⁷ According International Energy Agency (2023), in the US the capital cost of a utility-scale photovoltaic plant is on average three times as large as that of a combined-cycle gas turbine power plant, for each unit of effective production capacity. This estimate is likely a lower bound, as it does not include the investment in storage and other technologies needed to make photovoltaic electricity as flexible and reliable as that provided by the gas plant.

⁸ See e.g. Labandeira et al. (2016) for evidence about the energy sector; Faiella and Lavecchia (2021) for evidence on Italy.

The “natural experiment” represented by the energy crisis in Europe triggered by the Russian invasion of Ukraine confirms that a shock to “necessity” goods can have undesired consequences. In reaction to the sharp increase in the price of natural gas, governments subsidies to energy consumption increased dramatically,⁹ with an attendant surge in public deficits and a dampening of the price effect on energy demand; coal-fired power plants were put back in operation, and plans to dismiss them were postponed or abandoned. The lesson learnt has been dryly summarized by French President Macron (2023): “After all, it is now crystal clear that no country will work to protect the planet if the price it must pay leads its citizens into a socioeconomic dead-end.”

Summing up, a portfolio decarbonization strategy which aims to achieve its targets by simply shifting finance away from high emitters might be inadequate to achieve its objectives. On the one hand, it might generate unintended effects, impairing the transition to a low emissions economy. On the other hand, it would reduce transition risk (almost by definition), but it would be unable to distinguish between firms aggressively and credibly pursuing decarbonization efforts (low transition risk) and the ones conducting business as usual (high transition risk); also, it could be applied by the individual investor, but it would suffer from a fallacy of composition at the macro level.

3. Going beyond naïve decarbonization strategies

The pitfalls illustrated in the previous paragraph are being acknowledged. Naïve decarbonization strategies have been dubbed “paper decarbonization” by the Glasgow Financial Alliance for Net Zero (GFANZ). GFANZ now encourages its members to help high emitters in the “necessity” sectors to decarbonize their productions.¹⁰ In this new paradigm, the focus shifts from current emissions levels to planned emission reductions. The notion of a truly green firm includes not (only) a low emitter, but also a “virtuous” high emitter, i.e. one who ambitiously and credibly works toward cutting its emissions. Not surprisingly, transition plans have been receiving a lot of attention and are progressively being integrated into EU legislation on sustainability.¹¹

⁹ Black et al. (2023) document that worldwide explicit subsidies for fossil fuel consumption went from US\$0.5 trillion in 2020 to 1.3 trillion in 2022. Implicit subsidies are projected to rise from 5 percent of world GDP in 2020 to 6.1 percent in 2030.

¹⁰ To avoid paper decarbonization, GFANZ (2022a) recommends to steward emissions out of the economy, not simply pass them to someone else, arguing that “the financial sector needs a credible approach to financing high-emitting assets with retirement plans as part of broader net-zero transition planning”.

¹¹ Broadly speaking, a transition plan is a strategic document which spells out a firm’s strategy, actions and resources to either manage the risks and opportunities related to the transition, or achieve certain decarbonization targets, or both. See NGFS (2023a), OECD (2022), GFANZ (2022b), European Commission (2023), Transition Plan Task Force (2023).

This new paradigm is being increasingly acknowledged, but it has not yet become mainstream. Transition plans are still in their infancy. NGFS (2023a) acknowledges that there are multiple definitions of transition plans. Much of current regulation relies on the concept of high emitting sectors. For instance, the European Banking Authority, in its efforts to improve measurement of transition risks, requires banks to publish their exposures towards the ten high-emission sectors defined by the European legislation (which includes the entire manufacturing sector, without further distinction). The standard notion that a high emission firm is brown regardless of what it intends to do is still widespread.¹² This, in spite that, based on the argument just illustrated, current emissions may be a rather poor proxy for transition risk.

The new paradigm can be accommodated within the so-called “best-in-class” approach to sustainable investment. In a nutshell, investors adopting this perspective avoid divesting from the “necessity” productions/sectors; rather, within each production/sector they steer finance towards the firms that are leading the transition effort, and divest from the laggards.

In my opinion, this is an important step forward, and indeed, there is evidence that change is afoot, also thanks to EU legislation.¹³ However, while conceptually appealing, the best-in-class approach has its own problems when it comes to implementation. Only relatively few large firms have already developed transition plans – an essential ingredient for the approach.¹⁴ Furthermore, when available, these plans are hardly comparable, due to a host of issues, including heterogeneity of scope, horizon and measurement. Understanding and challenging these plans may require technical knowledge that typically lies outside the boundaries of a financial intermediary. Also, there is an issue of reliability. How to make sure that a high emitter is truly virtuous, and that transition plans are not just promises? How to differentiate between a high emitter that “excusably defaults” on its transition plan and one

¹² See footnote 4 above. The empirical evidence on the effects of decarbonization strategies on banks’ credit conditions is mixed. Aiello (2024) finds that following the publication of the 2020 SSM supervisory expectations, banks directly supervised by the ECB (so-called significant banks) with emission reduction targets reallocated credit away from firms with high emissions compared to less significant institutions. After the announcement of the climate stress test one year later, banks reduced credit to high emission firms with emission targets and simultaneously charged higher credit spreads. Similarly, Kacperczyk and Peydro (2021) find that banks with commitments to carbon neutrality reallocated credit towards low emission firms and away from high emission ones, including those with emission reduction targets. On the contrary, Altavilla et al. (2023) find that banks charge higher interest rates to firms featuring greater carbon emissions, and lower rates to firms committing to lower emissions, controlling for their probability of default; both effects are larger for banks committed to decarbonization. Goldman Sachs (2023) documents that although fossil fuel producers continue to be strongly under-represented in the portfolios of ESG-sensitive European investors.

¹³ Goldman Sachs (2023) argues that a shift from divestment of high emitters towards transition investing is ongoing, and argues that this is fostered by the EU Taxonomy, which provides a basis for sustainability funds to own energy companies in transition, particularly where they are investing in green projects ahead of their peers.

¹⁴ According to CDP (2023), in 2022 about 4.100 companies worldwide disclosed that they had a 1.5°-aligned climate transition plan; 1.800 of them made the related documentation publicly available; only 81 disclosed against all key indicators that denote a credible climate transition plan.

that “defaults with an excuse”?¹⁵ In general, there is a trade-off in the design of portfolio approaches: as their degree of sophistication increases they tend to become more decision-useful but also more complex and sensitive to assumptions and inputs (see e.g. Blood and Levina, 2020).

In what follows I discuss a few other problems and potential unintended effects of portfolio decarbonization strategies, including the best-in-class approach.¹⁶

3.1 What if there aren't enough “virtuous” high emitters?

A first potential problem relates to the availability of enough “virtuous” high emitters. The consensus among analysts is that global energy demand is set to grow further, especially as a result of continued expansion in developing countries. The EU gas crisis episode discussed in the previous paragraph tells us that if investors were to abandon the worst performers and this were to cause a fall in energy output that the best performers were not able to compensate, a likely scenario would be an increase in prices, with the consequences discussed above. Thus, reducing fossil fuels production is a necessary but not a sufficient condition to achieve the Paris goals; a parallel increase in energy production from clean sources is also necessary.¹⁷ A “Goldilocks equilibrium” is needed, in which prices for fossil fuels increase gradually and by the right amount through carbon pricing mechanisms, as illustrated by figure 1. This argument, which holds for the energy sector, carries over to other “necessity” carbon-intensive goods/industries.

Recent evidence suggests that less than 1 percent of the fossil fuels industry is covered by phase out commitments, and that the industry as a whole has made almost no progress towards the Paris Agreement goals since 2021. Most companies fail to disclose their capital investment in low-carbon technologies. Among those who do, investment falls dangerously short: the industry as a whole accounts for only 1 percent of total clean energy investment globally (World Benchmarking Alliance, 2023). What should (best-in-class) investors do in the face of this evidence? What power would their strategy hold to influence companies' behaviour? If even the best performers failed to decarbonize at a sufficiently fast rate, investors would need to choose between abandoning their approach vs abandoning their decarbonization targets. Neither outcome would be desirable.

3.2 What is the relationship between sustainability objectives and risk-adjusted returns?

¹⁵ For a discussion of these problems see e.g. Bolton, Kacperczyk, and Samama (2022); Comello, Reichelstein and Reichelstein (2021).

¹⁶ Starks (2023) provides a thoughtful and more thorough list of open issues and areas for further research.

¹⁷ In reality, the required parallel increase goes well beyond clean energy production: massive concomitant upgrades in distribution grids and storage facilities are also required.

A second issue for investors who decide to adopt decarbonization targets concerns the relationship between the targets and the traditional objectives of investment: risk, return, liquidity. This issue is strictly related to the other fundamental dimension of climate and finance: the proper management of risks, regardless of their sources. At some stage the decarbonization targets might conflict with the traditional investment objectives (any form of constrained optimization necessarily attains suboptimal results relative to the unconstrained one, if the constraint binds). If this turned out to be the case, what should be done? The literature has given an answer: the preference for sustainability should be an argument of the investor's utility function, at par with return and risk preferences.¹⁸ In other words, the intermediary should explicitly state if, and to what extent, it is willing to sacrifice return for sustainability, should a sacrifice turn out to be necessary. Fig. 2 illustrates the point conceptually, without claim of factual accuracy: investors who take sustainability risks into account achieve better results – proxied by the Sharpe ratio – than the unaware investors (the set of portfolios represented by the black dashed line dominates the optimal portfolio of the unaware investor); those who also have a preference for sustainability will do worse, in relative terms, than those who do not (they will willingly choose points on the green dotted section of the curve).

This conclusion raises various issues. First, it seems doubtful that net zero pledges can be credibly announced without mentioning the potential trade-off with returns, and to my knowledge, to date few if any intermediaries have been explicit about this trade-off. Certainly an asset manager cannot pledge to a carbon-neutral trajectory without the informed consent of its clients. Second, there are reasons to doubt that a majority of investors would be willing to prioritize sustainability at the expense of profitability. Recent theoretical analyses suggest that the efforts of responsible investors could be undermined by opportunistic investors, focused solely on the risk-return paradigm.¹⁹ Third, in case their net zero strategy underperformed (in risk-adjusted terms) relative to the market, investors committed to net zero targets would be forced to choose between accepting the underperformance, no matter how large, and abandoning their targets.

The above considerations suggest that there is no lack of private finance for the transition; there is a lack of projects capable of meeting investors' risk-return expectations (fig. 3). In general, and with due exceptions, private finance will not voluntarily internalize the externalities which most world

¹⁸ See Hart and Zingales (2017), Pástor, Stambaugh and Taylor (2021), Broccardo, Hart, Zingales (2022), Proserpi and Zanin (2024).

¹⁹ See Pástor, Stambaugh and Taylor (2021), Abiry et al. (2022). The risk-return issue is sometimes addressed with reference to the investment horizon. The argument is that a long-term oriented investor should be willing to accept the risk of lower returns in the short term, since the "green" investment will pay off in the long term. The argument seems flawed. It implies that two long-term oriented investors, one with a preference for sustainability and one without, would behave in the same way. This seems incompatible with the presence of the environmental externalities which are at the core of the problem.

governments are reluctant to tackle via first best strategies (some form of carbon pricing). The current debate turns around this key issue. A possibility is for governments to turn to incentives – and indeed, policies aimed at incentivizing the climate transition are commonly adopted worldwide. Also, considering that the bulk of emissions comes from emerging economies, capital injections, mainly operated by advanced economies, could allow multilateral development banks to co-finance investment at below-market conditions. In a similar vein, initiatives to scale up blended finance could be adopted (NGFS, 2023c).

Be that as it may, expectations about what financial intermediaries can contribute to the climate transition need to take these limitations into account.

3.3 What about carbon leakage ...

A third, well-known issue for investors embracing portfolio decarbonization targets (best-in-class adopters as well as others) is carbon leakage: if firms reduce carbon emissions by just transferring them out of their corporate scope or jurisdiction, that will result in null variation of emissions at the global level. A similar result attains if well-meaning investors move away from high emitters but less well-meaning investors move in. There is concrete evidence that leakage is indeed happening in various forms. A particularly disturbing phenomenon concerns corporate demergers associated with a greening of the firm's operations: firms divest highly polluting plants to buyers facing weaker environmental pressures, possibly with supply chain relationships or joint ventures with the sellers. Sellers benefit from higher ESG ratings and lower compliance costs, but there are no real improvements on pollution levels.²⁰ This implies that responsible investors need to distinguish between operations driven by genuine industrial considerations and those mainly driven by the objective to improve sustainability indicators. ESG ratings mingle the two profiles by construction, therefore they cannot help investors to capture these distinctions.

3.4 ... and reputational and legal risks?

A fourth issue concerns reputational and legal risks. Investors who commit to achieve certain decarbonization targets may be reluctant to walk back, for fear of reputational damage. Also, they may face litigation risk from various stakeholders, should they undermine their investment objectives or miss their climate-related targets (NGFS, 2023d). This is one final reason why careful analysis is warranted before adopting targets.

3.5 A possible way forward: the stewardship approach

²⁰ See Duchin, Gao and Xu (2023), Gozlugol and Ringe (2023), Fraser and Fiedler (2023), International Energy Agency (2023).

In the presence of such uncertainty, an option that is receiving increasing attention is the so-called “stewardship” approach (see e.g. PRI, 2021). In a nutshell, the approach envisions an active interaction between the investor and the firm, with objectives that can range from relatively simple (e.g. improving the understanding by the former of the latter’s strategy, building mutual trust) to very challenging (attempts by the investor to influence the firm’s strategy, e.g. via voting at shareholders meetings). In both cases, institutional investors could play a key monitoring role to curb information asymmetries on sustainability practices between management and other stakeholders.²¹

This approach raises a host of additional issues, too. First and foremost, in order to take a stand on sustainability issues investors need to understand firms’ transition and industrial plans, which typically requires knowledge about highly specialist issues (e.g. competing technologies), in settings characterized by multiple objectives and high uncertainty. As a result, such strategies tend to be very resource-intensive, and this can make them too costly for the average professional investor. Still, they may well be worth exploring. Engaging with a heavy polluter may allow investors to differentiate between a realistic and ambitious transition plan and a paper promise.

The Bank of Italy recently began a constructive dialogue with some high-emission firms whose shares are held in the Bank’s investment portfolio, aimed at better understanding their transition plans. We consider this dialogue important to properly manage the climate-related risks of our financial assets and to foster a smooth and credible transition to a low-carbon economy, within the scope of our mandate.

4 Conclusions

In their effort to contribute to the transition towards the Paris climate goals, many financial intermediaries have been pledging to achieve net zero financed emissions by 2050, possibly adding intermediate quantitative targets. These investment strategies aim at rationing finance for the high emitters, thereby reducing their investment and productive capacity. In this paper I have argued that strategies based on divestment from “necessity” carbon intensive sectors (e.g. energy, steel, shipping, ...), however well-meaning, might produce unintended consequences: they might impair real-world decarbonization, and fail to mitigate transition risk in the intermediaries’ assets.

Recently, these issues are being acknowledged. For instance, GFANZ now encourages its members to help high emitters in the “necessity” sectors to decarbonize their productions. In this new paradigm

²¹ See for instance Li and Yang (2023), Leland and Pyle (1977), Pagano, Panetta and Zingales (1995).

a truly green firm is not (only) a low emitter, but rather a “virtuous” high emitter, i.e. one who ambitiously and credibly works toward cutting its emissions.

The so-called “best-in-class” approach to sustainable investment can address part of these issues. Investors adopting this approach avoid divesting from the “necessity” productions, steering finance towards the high emitters that are leading the transition effort, and divest from the laggards. However, this approach also presents a number of conceptual and practical problems. Furthermore, it may be incompatible with a portfolio decarbonization target.

For non-financial firms, decarbonization targets are part of transition plans: industrial plans committing the firm’s bottom line to a concrete program of investment, to be implemented in the short to medium term. In these plans, the relationship between capital expenditure and emissions, and hence transition risk, is conceptually straightforward, although possibly complex in practice. For financial firms, transition plans are a completely different issue. Indeed, committing to a net zero portfolio may entail many different things, each with a host of poorly understood implications for real world decarbonization and transition risk.

Overall, these considerations suggest that more research is needed to make sustainable investment strategies effective. The so-called “stewardship” approaches, through either engagement or voting initiatives, are receiving attention. But in a market economy only the managers, the board and the shareholders of a company can make key corporate decisions, including if, how and to what degree to invest in the transition. Given the profit maximization objective of firms, public policies (in stick or carrot version) are necessary to correct private decisions that are socially suboptimal due to externalities. The regulatory packages introduced by the EU indeed go in this direction. Similar objectives can be pursued by empowering multilateral development banks to foster public-private partnerships aimed at mobilising capital for the climate transition of developing economies. It is from these drivers, more than market finance, that a key contribution to the transition should be expected.

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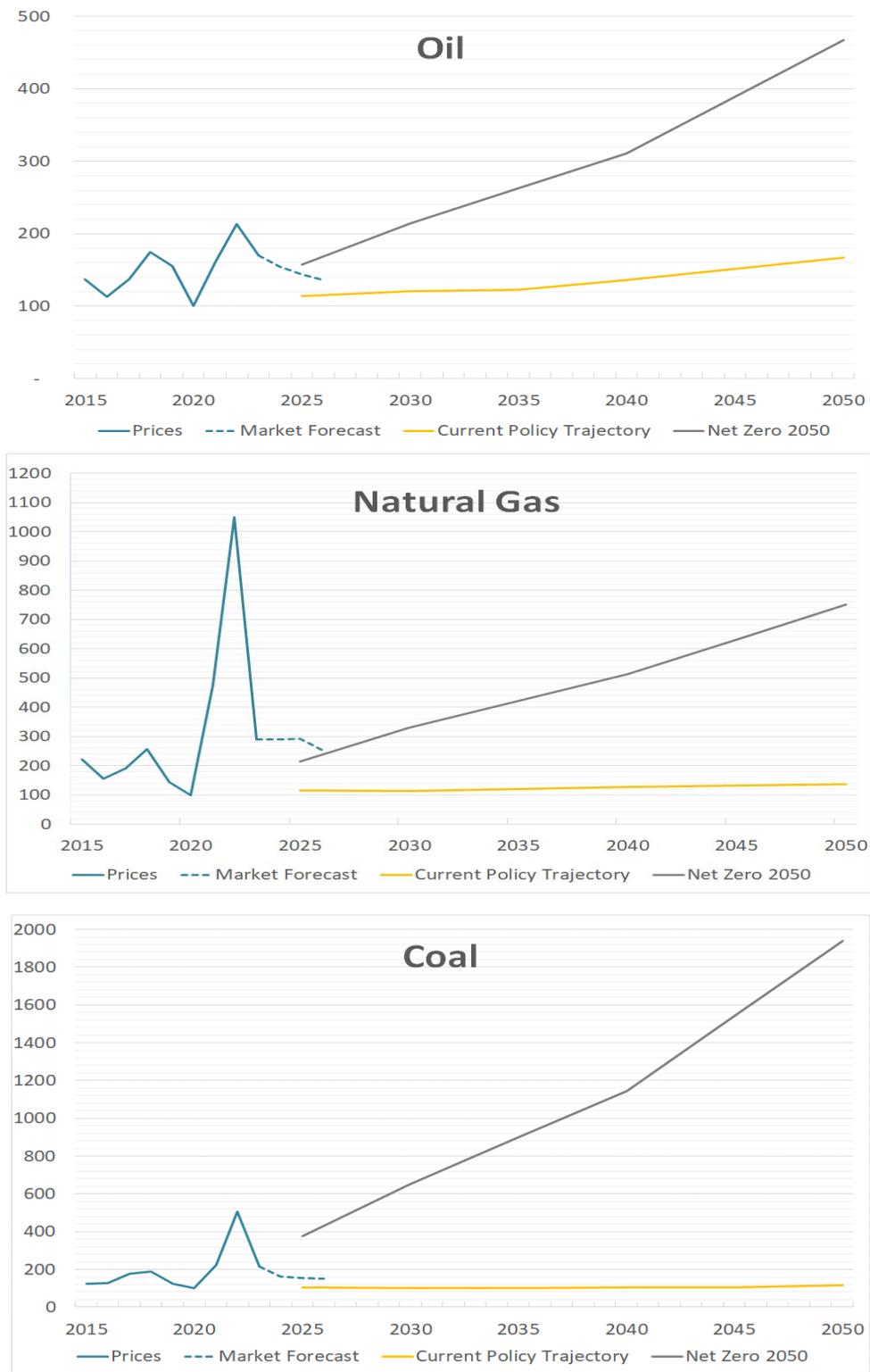
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Figure 1: Shadow carbon prices in NGFS scenarios

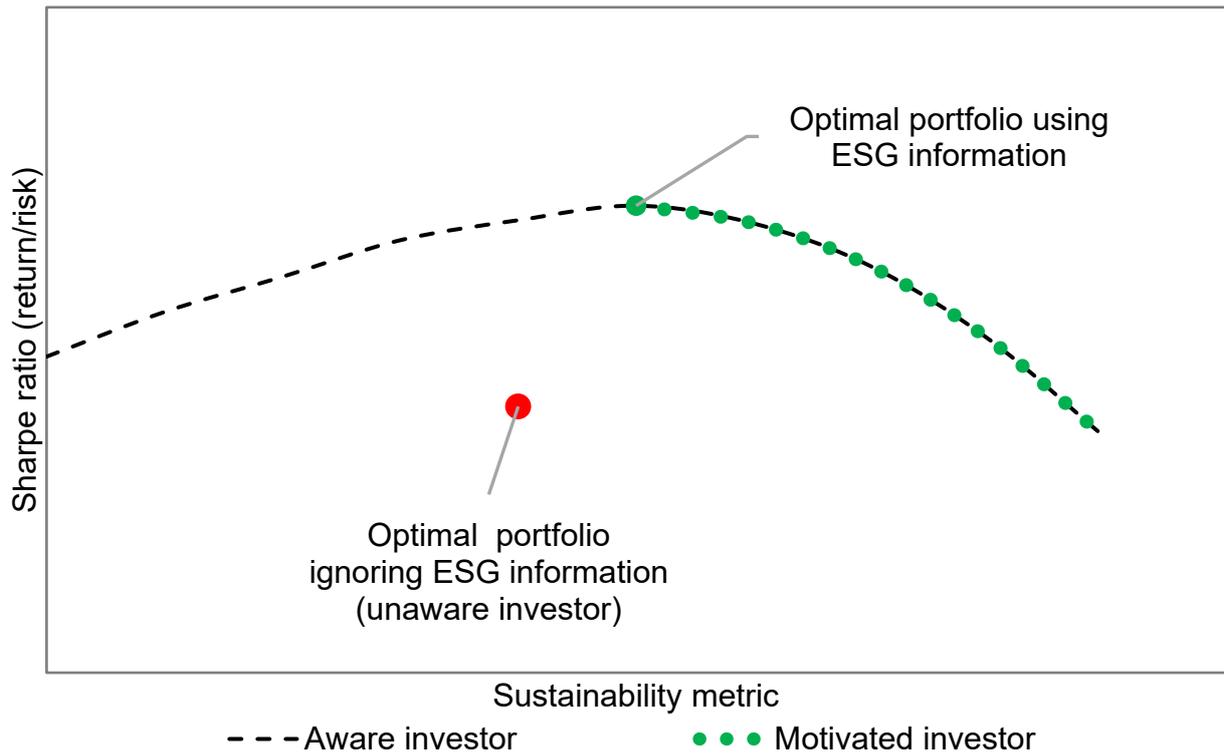
(indexes; 2020=100)



Source: Own elaborations on data from NGFS (2023b).

Note: For realised prices, quarterly averages; for market futures, futures prices as of January 2024. For Oil realised prices, [ICE Futures Europe Brent Crude Futures](#). For Natural Gas realised prices, [ICE Endex Dutch TTF Natural Gas Futures](#). For Coal realised prices, [Rotterdam coal futures](#). Current Policy and Net Zero 2050 trajectories include the sum of primary energy price and carbon price projections based on average emission intensities. This carbon price represents a simplification of a variety of real-world climate policies (carbon tax, subsidies, environmental standards, etc.).

Figure 2 – Risk, return, and preferences for sustainability



Note: The figure is a simplified version of a figure in Pedersen et al. (2021). The curve represented is for illustrative purposes.

Figure 3 – Not all projects that promote the transition are investable

