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The role of capital markets in saving the planet and changing capitalism - just kidding

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Abstract

Environmental, social, and governance or ESG investing has experienced a massive inflow of funds in recent years. Given the emphasis on ESG in the media and among the finance community one could easily believe that capital markets are a major contributor to the goal of limiting global warming. Focusing on the environmental dimension of ESG we argue this perception is largely false; a narrative strongly pushed by the finance industry to highlight green initiatives and in so doing, block further (potentially profit-reducing) regulation. We frame our work relative to the finance literature, mostly drawing from economists, but with a critical sensibility drawn from financial geography more generally. Our contribution is to offer a critique of ESG financing on "its own terms" and show how it is largely failing to deliver the outcomes that the finance literature and economic theory would predict. Three main arguments back our analysis: First, actual real-world climate-change prevention driven by capital markets are rather minuscule. Slightly higher capital costs do not translate into meaningful price changes, and in any case, demand often has very low elasticity. Second, while some investors are willing to sacrifice returns for climate-change prevention, most intermediaries are not. Instead, the risk of greatest concern to the finance community is not a warming planet, but potentially upcoming climate-change regulation ("transition risk"). Absent clear standards for measuring impact on climate change, many standard financial products are easily "greenwashed", providing opportunities for higher fees by funding managers and other financial actors but little actual impact. Third, many green investments would have been done anyway, and so green financing is hard to distinguish from conventional funding. Given this, we argue that even fully green capital markets will not save the planet and may be counter-productive to the extent they provide arguments and political cover against enacting stricter real-world regulation.

1 - Introduction

Sustainable finance is currently en vogue. The United Nations' Environment Programme includes a Finance Initiative that aims at "[c]reating a financial industry that positively impacts and serves people and planet" (UNEPFI 2021). The G20 has installed a Sustainable Finance Working Group; the OECD operates a Centre on Green Finance and Investment, the European Commission provides a Platform on Sustainable Finance, and most national governments have similar operations. Central banks are now stress-testing respective financial systems on the ability to cope with climate change and the respective regulations.

Politicians are likewise advocating for effort from capital markets. As Tony Blair, then Prime Minister of the United Kingdom, wrote in 2003: "[...] the answer to reducing greenhouse gas emissions lies as much with companies and investors as it does with governments, international agencies and the public" (Pattberg 2012, p. 621). This interest from states is more than matched by the private sector. Almost all banks, asset managers, accounting firms and other financial players involve themselves heavily in sustainable capital markets and assets. Both academics and practitioners have likewise noted the centrality of environment related finance. Castree and Christophers (2015) argue that "[F]inance capital, including credit creation, will be crucial to enabling us to adapt to a changing biophysical world and to mitigating some of that change" and Deutsche Bank's CEO Christian Sewing claiming that banks "risk losing their license to operate" if they would not take this very seriously (Deutsche Bank 2021).

Given all this attention to ESG and sustainable finance, it would be easy to believe that the financial sector plays a big role in reducing the ongoing warming of the planet. We, however, argue that the "green capital" efforts showcased by the financial sector have been ineffective at best, and potentially counter productive. While 80 percent of the 100 largest firms in 52 countries have adopted sustainability disclosure standards (GRI 2020), compared to a handful twenty years ago, CO2 emissions have risen by about 40 percent during the same time (Statista 2021a). Despite being surrounded by rhetoric about reducing CO2 emissions, the impact of the "actual existing green capital markets" (Brenner and Theodore 2002) on stopping climate change is surprisingly unclear. Through a detailed analysis of the motives and actions of different players in sustainable financial value chains we ask what kind of effects it is having. Are sustainable financial practices successfully addressing climate change? And if so, how? Alternatively, we ask: To what extent is sustainable finance "window dressing"? And if so, to what ends?

There have been important critiques of sustainable finance by geographers, sociologists, political scientists, heterodox economists, and others. For instance, authors are concerned with the financialization of nature (Ouma et al. 2018), the framing of climate change as a business risk (Pattberg 2012), or with the reproduction of capitalist inequalities both within countries and internationally (Jäger and Schmidt 2020a, b). Critical in-depth studies center on individual markets and players, such as carbon markets (Bridge et al. 2020), investors in fossil fuel companies (Christophers 2019) or on impact investors (Langley 2020). We contribute to the literature by focusing our critique on the micro-level, i.e., the behavior of firms and individuals as participants located in different positions along the value chain in sustainable capital markets.

To connect our research to existing literature we first considered the work on global financial networks (GFN) (Coe et al. 2014; Haberly et al. 2019). While similar in

terms of interest in tracking financial flows in the global economy, the GFN approach tends towards a more macro scale with a focus on global financial centers and connections between them. Our research for this paper, however, took a much more micro-scale approach, looking at specific actions of firms, banks, and other financial actors with less direct concern for macro-level structures and geographies. Thus, while GFN is certainly relevant to this work, there is a disconnect between the micro and macro that we were unable to easily fill in this paper and see as an analogue to the long established divide between macro and micro in neoclassical economics.

Instead, we frame our work relative to the finance literature, mostly drawing from mainstream economists, but with a critical sensibility drawn from economic and financial geography. Doing this allows us to critique ESG financing on "its own terms" and show how it is largely failing to deliver the outcomes that the finance literature and mainstream economy theory predict. Our conclusion is that ESG finance is primarily oriented towards the financial return-based needs of retail and institutional investors; and contains exaggerated (if not outright misleading) claims of positive environmental impact without impacting firms' behavior. We use a governance framework based on Bracking and Leffel (2021) to explain the underwhelming outcomes of the ESG finance markets.

The paper proceeds as follows. In section 2, we briefly introduce the market for green financial products and its growth over the past decade. In section 3 we lay out our framework and the applied methods; section 4 presents the way green finance is supposed to work and is presented in many discussions and overviews. The next section 5 accommodates the main analysis of players and processes. Section 6 concludes.

2 - Sustainable Finance - an Overview

The main stated goal of climate and sustainable finance is reducing greenhouse gas emissions. Action on climate change traces back to the 1992 United Nations Framework Convention on Climate Change (UNFCCC) in 1992 and later Kyoto Protocol (1997) and Paris Agreement (2015) and was primarily concerned with intergovernmental negotiations. As a result, sustainable finance was initially directed at governments and public institutions (such as development banks) that were financing projects in the developing world.

The focus of sustainable finance has changed dramatically since that time. First was the recognition that some people – so called "impact investors" – cared for the environment enough to forgo some return. Later, around 2015, a number of influential scientific studies appeared showing that investing in firms with strong ESG characteristics were more profitable than in other firms (see, e.g. Eccles et al. 2014, Khan et al. 2016) and these studies were backed by practitioners experiencing the same results (see Eccles and Klimenko 2019). This changed the perception of ESG investing from a fringe niche to something of interest to mainstream financial actors and a distinct increase of investment flows shifting from conventional firms to greener firms.

The United Nations' UNCTAD estimates the global value of sustainability investment products to $3.2 trillion in 2020. Sustainable funds that invest in companies are the largest group with about 1.7 trillion, followed by sustainable bonds issued by state institutions and firms with $1.5 trillion (of which green bonds constitute roughly $1 trillion, and social and mixed sustainability bonds about $200 billion each) and finally

sustainable loans that are estimated to be around $200 billion (all figures from UNCTAD 2021).

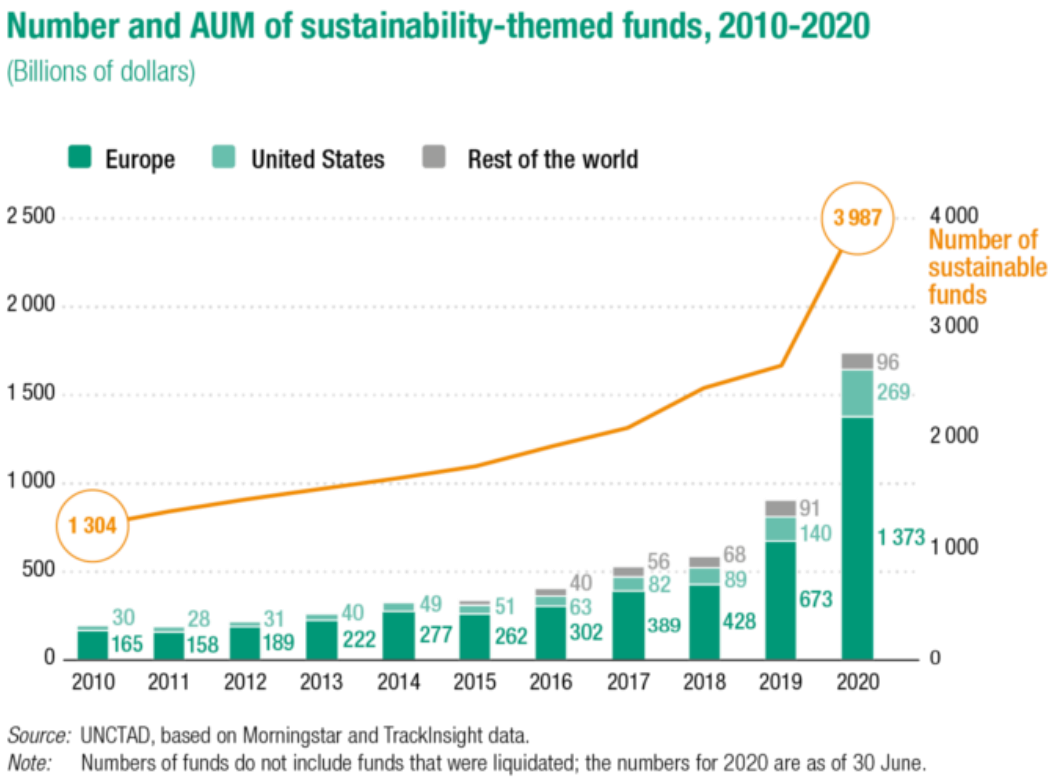

Figure 1: Growth of sustainable funds. Source UNCTAD (2021)

Focusing first on investment funds, assets under management and the number of funds have experienced a strong increase since 2018 (see figure 1). As with many other funds, exchange-traded funds are becoming popular in the ESG sphere, too, showing the maturing of the sector. Deutsche Börse records a tripled trading turnover of these funds within a year and reports similar growth in assets under management. Already, ESG ETFs account for about 16% of the total ETF trading turnover (compared to 6% the year before).

The green bond market – issued by supranational organizations, national governmental organizations and firms – has experienced similar growth. While ESG-themed bonds still only reflect a small part of the total $119 trillion bond market, growth of green bonds is forecasted to be strong in the next few years (Bloomberg 2021, Nastu 2021, UNCTAD 2021). Finally, the sustainable loan market consists of classic loans that are used to finance specific investments, and, more recently, so-called sustainability-linked loans whose interest payments depend on the total ESG performance, e.g. measured by suitable ratings of the whole firm.

Sustainable investment displays a strong geographical bias. For example, almost three quarters of funds are domiciled in Europe, with Luxembourg hosting almost 30 percent of all funds (as measured by assets under management). North America hosts 18 percent while the rest of the world is home to only about 10 percent of all sustainability-linked funds. In contrast, less than 3 percent of the world's sustainable-linked assets are hosted in developing and transition countries, despite their equity markets accounting for 23 percent of global market capitalization. Green bonds and

sustainable loans have similar geographies, with Europe consistently accounting for 50% or more of the amount issued (UNCTAD 2021).

A key part of ESG finance is demand for accounting firms, not only to provide a picture of the firms' financials, but also to track firms' impact on the environment and society. A recent news article reports that PwC plans to hire over 100,000 people to focus on ESG, which would increase its current workforce by 35 percent (DiNapoli 2021). In the same vein, Deloitte has announced that it will train (or "empower") all of its 330,000 employees on climate related issues and business opportunities (Deloitte 2021). Clearly, many financial players see ESG and sustainable finance as a profitable new opportunity.

Less certain, however, is what it means to be green or sustainable and how this contributes to stopping climate change. For example, green financial products require statements about the use of proceeds, but the law firm Skadden (2021) finds that "many of those instruments state that the issuer may not be able to use the proceeds for the intended purposes." In short, green investments are not necessarily required to be green. According to the Global Sustainable Investment Alliance (2021), Europe experienced a 13 percent *decline* in reported sustainable investment assets between 2018 and 2020 due to "revised definitions of sustainable investment" which is consistent with the idea that some sustainable products were mislabeled. Despite these concerns, the growth of sustainable investment continues to accelerate: more than 80 percent of professional investors worldwide plan to increase their allocation to ESG-related investment in 2021, compared to 74 percent the year before (Statista 2021b).

3 - Framework and Method

There is a vast literature on green and sustainable investment by finance scholars, often shaping the political debate around ESG-themed capital markets. While there are a lot of terms associated with environmentally friendly capital markets, there is some convergence around a few (see Jäger and Schmidt 2020a). These include "green finance" or financial instruments/flows mostly focused on the environmental Sustainable Development Goals (SDGs) set by the United Nations; "sustainable finance" that expands this to include UN SDGs that are not specifically environmental; and "climate finance" that today is mostly a part of green finance, but originally focused on something close to public development aid (via concessional loans) to developing economies become more environmentally friendly (Bracking and Leffel 2021). Given this overlap we use these terms interchangeably, particularly since they all largely look to the private sector as the main source of capital, a key focus of this paper.

The economic and financial geography community has engaged with green finance, including work on the financialization of "nature" (Ouma et al. 2018) and the contextualisation of climate change as a business risk (Pattberg 2012). Other examples include a lively discussion around carbon markets such as Bryant (2019) analyzing the establishment of new carbon markets as well as Bridge et al. (2019) and Langley et al. (2021) analyzing the ways carbon becomes an asset. Other related work includes the direct financing of renewable energy technology by, amongst others, Baker (2015), Klagge and Nweke-Eze (2020) and Klagge (2020).

Governance Framework

Our goal is to add this work by critically engaging with the concepts and topics of green finance used in the finance literature through the critical lens of economic and financial geography, to contextualize and situate this discourse in a governance framework. In other words, how has the dominant free-market ideology and the retreat of the state given enormous leeway for private players to shape ESG-related capital markets to their advantage (Bracking and Leffel 2021; Christophers 2017). In so doing we seek to build on the work of others including Langley's (2020) and Cohen's and Rosenman's (2020) focus on impact investors, and Christophers' (2019) analysis on the motives of investors in fossil fuel companies. Other work includes Harnett's (2018) research on the communication channels used by ESG investors, Bigger's (2017) critique of green bonds, Langley's and Morris' (2020) consideration of the role of central banks and Hughes et al.'s (2021) look at the distribution of ESG ratings. We argue that economic and financial geography offers a more holistic understanding of the workings of ESG capital markets than a purely financial perspective, and could help to understand the markets' apparent ineffectiveness even as measured on its own terms (setting aside larger structural critiques). In particular, we contend that this understanding drawn from the European context is essential before ESG investing is rolled out worldwide.

To achieve this we build a framework to understand the "actual existing green capital market" (see Brenner and Theodore 2002) versus the global hype that has failed to foster much change in the real world. By focusing on governance, we are able to sort the different findings of ineffectiveness within capital markets - even judged from a finance perspective - under a common frame. Thus the failure of green capital markets to counter increasing CO2 emissions is not a problem of size, i.e., green finance is too small relative to normal finance, but that the principles of operation of capital markets (as defined by neoclassical economics) cannot properly incorporate the damage inflicted on the environment by economic activity. Or, put differently: "[...] capitalism is all about the accumulation of capital and the production of exchange value in order to make profit, while the production of use values is simply a by-product" (Jäger and Schmidt 2020b, p.33). In other words, private green finance cannot address climate change absent strong, non-profit oriented governance that constricts and directs action. As Castree and Christophers (2015, p. 2) put it: "In effect, the financial sector is an unelected government whose power is such that it needs to be carefully governed through a set of endogenous and exogenous norms, rules and institutions." Unfortunately, thus far the contrary seems to be the case. Current governance of green finance gives ample leeway to private capital markets and market participants, leading to a state of "neoliberal green finance" (Jäger and Schmidt 2020b).

Markets Designed to be Ungoverned

This, however, is far from an accident; green financial markets have been deliberately designed this way. Roughly beginning in the 2000s many sustainable finance initiatives have been predicated on the inclusion of private capital based on the notion that public money would not be sufficient to finance the world-wide transition from a carbon-based economy to a climate-friendly one. This started with "blended finance", where public money (taking most of the risk) and private money (providing the bulk of financing) invest in parallel in financial instruments. Christophers (2017) describes how this evolved to "market discipline" becoming one of the cornerstones of green finance ultimately increasing the influence of private governance networks based around a "polycentric system" (Bracking and Leffel 2021, Ostrom 2010). Accordingly, governance is understood in a multi-scalar way,

including supranational organizations like the UN, governments on a national level as well as private actors and non-state associations, all sites of decision authority.

This, along with the goal of incorporating private capital has shifted governance via regulations and laws - e.g., a relative limit of CO2 emissions - towards the neoliberal logic of governance via markets shifting power to financial institutions and private capital markets actors eager to accept it (Bigger and Carton 2021).

> "In turn, private financiers contribute to climate finance governance, in that products are increasingly operated, implemented and governed by them, using market-based logics and profits-based rates of return. But even though this can be described as mutually coproduced, when climate finance is being dispersed as blended finance, aspects of its accountability, authority and legitimacy are still reframed using privatized metrics and calculations. In this sense, measuring and evaluating the public good aspect of addressing climate change is ceded to the private sector's ontological space, its mode of seeing and valuing" (Bracking and Leffel 2021, p. 8).

The result is the proverbial case of throwing the baby out with the bathwater: in order to accommodate private capital investments, the whole set of public good values have been substituted for capitalist metrics. Accordingly, financial instruments are labeled green and sustainable by private actors, without much involvement of public authorities. Only recently, with the introduction of the "EU taxonomy" by the European Commission in 2020, have governmental actors reclaimed a stake in the development of green finance. This taxonomy establishes a list of economic activities that are considered to be environmentally sustainable and thus "[...] it should create security for investors, protect private investors from greenwashing, help companies to become more climate-friendly, mitigate market fragmentation and help shift investments where they are most needed" (European Commission 2021a).

While laudable, it is important to note that the taxonomy is geared exclusively to private investors, companies and markets. In other words, the establishment of the taxonomy is an act of public governance, but it does not mark any shift away from the focus on private capital markets. Moreover, members of the "sustainable platform" at the European Commission responsible for developing the taxonomy included persons working for OMV, an oil and gas corporation, the European Construction Industry Federation, Allianz, an insurance, Iberdrola, an energy company, Airbus and other industries' representatives, next to delegates from ecology groups and public authorities (European Commission 2021b). In short, even during moments of public governance, the private financial sector remains central (see Bracking and Leffel 2021). Other action from governments and supra-governmental organizations has also been eagerly met by financial institutions, happy to polish their image after the turmoil of the financial crisis in 2007/8 while simultaneously providing new opportunities for maximizing profits (Claar 2020, Monk and Perkins 2020, Jäger and Schmidt 2020b).

Overview of Method

Our approach in this paper is to critically engage with the concepts, topics and assumptions of green finance used in the finance literature through the lens of financial geography and the governance framework outlined above. We identify key documents on green finance by an extensive review of the finance literature in the leading finance journals as well as working papers. In our analysis, we focus on moments of disconnection between the assumptions of how existing governance is

supposed to work, and how the actual existing green markets do work. We contribute to the emerging literature critiquing ESG-related capital markets by applying a micro-level perspective, on the incentives and outcomes of capital market participants' behavior along the value chain of investing in green financial markets. We show that ESG finance is largely failing to deliver the outcomes, noticed even within the finance profession proper and their academic substructure. We use the governance approach to aggregate and interpret these findings and "make sense" of it.

We buttress these findings from our own participatory observations in eight ESG finance-related practitioners conferences, mostly taking place in Frankfurt, Germany, or online in 2021 (see figure 2). Germany is one of the leading countries both in terms of the installed base of green products and of the sector's growth.

ESG Ratings: The Good, the Bad, the Ugly; Corporate Governance Institute at Frankfurt School of Finance & Management, Frankfurt, 9 September 2021
Nachhaltige Geldanlagen 2021, Frankfurt School of Finance & Management, Frankfurt, 15 September 2021
M&A and Private Equity 2021, Frankfurt School of Finance & Management, Frankfurt, 28 September 2021 (with a focus on ESG and M&A)
Frankfurt Institute for Risk Management and Regulation: Council Meeting, Mainz, 29 September 2021
Deutsche Börse: Börse im Gespräch zum Thema "Herausforderung angenommen: Europäische Finanzmärkte nachhaltig stärken! – Die Entwicklung vom nachhaltigen Finanzprodukt zum nachhaltigen Finanzmarkt", Frankfurt, 19 October 2021
Fourth ECB Forum on Banking Supervision "Tomorrow's banking: navigating change", Tuesday, 9 and Wednesday, 10 November 2021, Online, subtopic "Climate change: are banks and supervisors prepared?"
7th Green Finance Forum, part of the Euro Finance Week, dfv, Frankfurt, 16 November 2021.
Future Europe Sustainable Europe: The Global Winter Edition, Maleki Group, Online, 9 December 2021

Figure 2: List of ESG Finance-Related Practitioner conferences

Additionally, we interviewed four specialists in the ESG finance area, and analyzed published statements of (former) green asset managers. Supplementarily, we draw on the experience of one of the authors as president of the Frankfurt Institute for Risk Management and Regulation (FIRM) and member of the Management Board of the Society for Risk Management and Regulation, an industry body for risk management practices of financial institutions, founded in response to the financial crisis in 2009. Participating in many meetings with high-level banking and consulting practitioners helps us to contextualize the findings from the literature.

4 - How it should work: Transmission mechanisms

We start by outlining an idealized transmission mechanism from sustainability-prone investors to companies' impact on the real world, e.g. in the form of reduced CO2 emissions. The economic underpinnings are outlined by Pástor et al. (2020): Investors derive utility from both, the financial gains they earn holding the firms' shares, and from the positive social or environmental impact of these firms. The greener the preferences of the investor, the more she is willing to trade environmental impact for financial return. For instance, investors could start buying shares of wind farms, despite the fact that they are less profitable than coal-burning energy firms. The wind farms would then experience a (one-off) share price increase, which is associated with lower financing costs - hence providing lower financial returns for investors. Other firms would observe this and choose to become more ESG friendly in order to achieve higher share prices, as well as lower capital costs, further reinforcing incentives for green investments. In an equilibrium model green firms can outperform normal, or so called "brown firms", only when investors' ESG preferences increase unexpectedly. This can be triggered, e.g., by regulation (Pástor et al. 2020) or by events such as extreme weather events (Anderson and Robinson 2021) that trigger demand for sustainable shares.

On a micro-level, "green" investment starts at the ultimate (retail) investor and ends at the mitigation effect on global warming; a complex process involving many players and product layers. Figure 3 gives a highly stylized overview of the process:

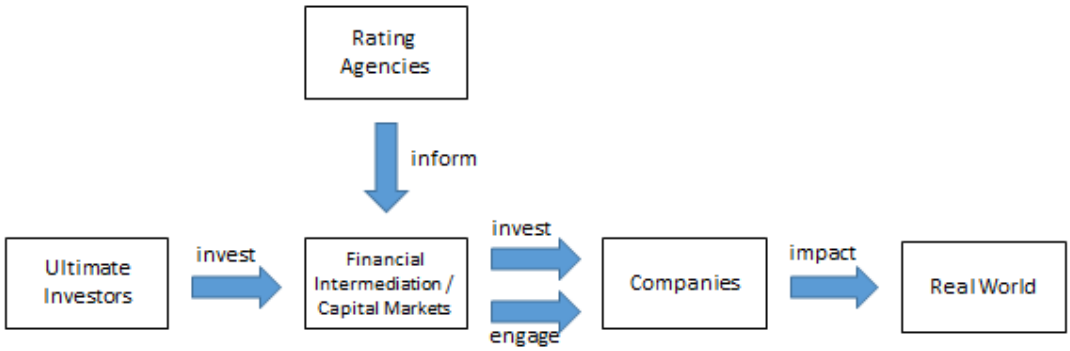

Figure 3: Chain from Investors to CO2 emissions

Ultimate investors in green finance are households that usually do not enter the investment process without the help of financial intermediaries or capital markets. These investors have different motives and invest in different ways: directly via depositing savings at a bank, buying shares, bonds, index or mutual funds via a broker, or indirectly via pension funds or life insurances (in the latter cases an additional set of intermediaries come into play). Except for the pure-play brokers, financial intermediaries use ESG ratings either produced in-house or from rating agencies to inform their investment decisions. These decisions might be driven by algorithms, humans, or both. After reaching a decision, financial intermediaries give loans to firms, buy shares or bonds from firms or governments to deliver (mostly financial) returns to the ultimate investors and to earn their fees. Many large investors - such as banks or large mutual fund companies - also engage with the companies they invest in, either by talks or voting in shareholder meetings. This might drive, together with the newly acquired green funding, firms to change their

behavior - e.g., reduce their CO2 footprint in production - and thus help mitigate global warming.

While sustainable investment processes are not fundamentally different from any non-green investment process, surprisingly little is known about the efficacy of these investments: the extent to which green investments cause firms to reduce CO2 output is simply not known, and there are almost no mentions or discussions of actual results at investor conferences or in the financial press. In short, the effects are assumed based on neoclassical theories rather than measured or tested.

5 - Where it does not work as predicted

In what follows, we analyze the different actors highlighted in Figure 3 and their relationships with one another in more detail with particular attention to points during the process where the efficacy of green finance on concrete outcomes (such as reduction of CO2) might be lost.

Investors

Investors are diverse with different motives for investing - some focused only on returns, others happy to accept a lower return in exchange for environmental gains (i.e., they derive non-pecuniary utility from their investment). Frequently, investors are ranked according to their motives (figure 4):

shade of green	investors' main motive	main investment reasons
	philanthropy	invests in activities with high ESG scores and little or no financial return
	impact	willing to take lower financial return in exchange for high ESG scores
	positive screening	return driven, seeks firms with high ESG scores, often to invest in potential gains
	negative screening	return driven, avoids firms with worst ESG scores, often to hedge risks
	financial return only	would invest in any asset, e.g. "vice funds"

Figure 4: Investor types by main investment motive, own compilation

The number of categories in figure 4 is arbitrary; in reality, there are many more shades of motives and overlapping categories reflecting the complex behaviors and priorities of investors. Still these categories help highlight the variation in behaviors and use of financial products. Of most interest are impact investors – a potentially large group of investors willing to sacrifice returns for investments that deliver "impact" allegedly because they derive utility from others' well-being (see Barber et al. 2021) or from the very act of behaving pro-socially (Andreoni 1990). This likely varies over investors with different levels of "willingness to pay" for these services.

Interestingly, sustainable investments do not require a great amount of sacrifice in returns. A study from Morgan Stanley of about 11,000 mutual funds over 15 years shows no systematic return differences between sustainable and other funds - but lower risk for the sustainable ones (Morgan Stanley 2019). Authors from the Hong Kong Monetary Authority come to a similar conclusion. In a paper called “The economics of the greenium: How much is the world willing to pay to save the Earth?” they conclude “Sadly, not much” (Lau et al. 2020, p.1). They find an average return difference between green and traditional bonds of one basis point, or 1/100th of 1 percent, albeit with some variation between individual green bonds. Kapraun et al. (2021) also find no differences between green and traditional bonds on average except green certificate bonds (carrying a certificate from a third-party institution) that have a premium of around 16 basis points (0.16%), and there is some more heterogeneity between the bonds. In short, on average, neither investors in sustainable funds nor investors in green bonds forego any meaningful return compared to investments in comparable traditional assets.

What aligns many medium-green impact investors' interests with those of other financial players is the good feeling derived from investing in green assets, sometimes dubbed “warm glow”. In an experimental study, Heeb et al. (2021) show that investors forgo some return for sustainable investments but do not select higher impact investments requiring them to forgo more return. They have done something good, proved that they care, contributed their share to an environmentally friendly economy, maybe even sacrificing (a minuscule amount of) money for the greater good of leaving an intact planet for their children and grandchildren. All this with no harm, on average no costs, efforts or opportunity costs. In the words of Heeb et al. (2021, p. 5): “Our results [...] suggest that pro-social investors are more likely to maximize financial performance while optimizing the warm glow that they derive from their choices”, instead of rewarding higher impact of investments with higher prices. For these “feel good” investors, disturbing information about the lacking actual impact of their investments would be detrimental to their well-being. They are presumably happy to learn about triple bottom-line accounting, eco-friendly funds investing according to ESG ratings in green bonds, guided by the EU taxonomy, and delivering premium returns.

This has severe consequences for the environment. Namely that “sustainable investing may turn out to be a much less effective mechanism than previously thought for curbing externalities” (Heeb et al. 2021, p. 6). It might be even detrimental: Hagmann et al. (2019, p. 484) find that small-scale nudges might decrease support for stronger measures “by providing false hope that problems can be tackled without imposing considerable costs”.

Of course, some investors take a more activist approach, bypassing intermediaries and engaging directly with firms. An ESG-driven hedge fund, Engine No. 1, has made proposals to introduce external, ESG-minded board members on Exxon Mobile’s board in 2021. Despite owning only 0.02 percent of Exxon shares, it was able to gather enough support from other large funds to vote three new board members on Exxon’s board and on two shareholder proposals against the management’s recommendation. The proposals were about a report on lobbying, and a report on how the lobbying aligned with the goal of reducing global warming (Skadden 2021, Klein and Goldstein 2021). Again, these concern foremost reports, but also installed new persons on Exxon’s board that might change the company’s strategy to become more climate friendly. As Eccles and Mayer (2021) put it: “environmental and social issues are major constraints on the financial performance

of their investments". This "proxy fight" is done to create financial value for shareholders, and might hinder global warming, too.

Asset managers

One thing that makes ESG investments attractive for financial institutions are the above average fees associated with them, justified by the higher effort to choose and evaluate the underlying assets (Wursthorn 2021). Especially for asset managers that are under pressure from exchange-traded investment funds (ETFs) replicating indices at very low fees, this is a highly welcomed development. Labeling an otherwise plain vanilla, index-mimicking fund "ESG" by excluding oil and other extraction firms provides the possibility to charge higher fees than before, Simpson et al. (2021) find fees in an ESG fund to be 5 times higher than a very similar normal fund of the same firm). Fittingly, ESG-themed exchange traded funds commitment to improving the environment is questionable: For the industry's largest fund, the Vanguard Social Index Fund with $9 billion assets, Rao (2020) traced the voting history on ESG-related shareholder resolutions. She finds the "Vanguard Social Index Fund has voted *against* almost all environmental resolutions over the past 14 years. The same is true of other socially conscious resolutions, including board diversity" (Rao 2020).

In 2021, two leading managers of large asset management companies, DWS and Blackrock, made headlines in connection with their respective departures. Both stated that they left in large part due to the greenwashing happening at their respective companies. As the ex-manager from DWS, by far Germany's largest asset manager and a subsidiary of Deutsche Bank, puts it: "[DWS] reports externally that a large part of the investments are in ESG-compliant investment strategies, but explains internally that it is only a fraction. The board was aware of these errors, the operational risk and the misrepresentation. [...] The sustainability propaganda and rhetoric of DWS, but also of other financial institutions, got completely out of control." (Der Spiegel 2021, authors' translation). A similar account comes from an ex-manager from BlackRock, the world's largest asset manager with about $9.5 trillion assets, who was responsible for incorporating ESG activities across all investment activities. In 2021, he published a "Secret Diary of a 'Sustainable Investor'", in which he observes: "financial firms seem mostly in a race against one another to declare that ESG, like anything with the word sustainability in it, is good for business" (Fancy 2021). Accordingly, at his firm, "[t]he marketing and sales people [...] were all about ESG — they couldn't get enough of it. The portfolio managers were often the opposite: many of them wanted to pass the "ESG test" and be left alone" (Fancy 2021). These two insider accounts are in line with investors' relative disinterest in the actual impact of their investments and financial institutions' goal of maximizing profits.

Figure 3 highlights two possible influences of the financial sector on companies, financing and engagement. The former is fairly straightforward, the provision and terms of loans or bonds, but the latter is more complex as it involves the actions undertaken by equity investors (individuals or more likely fund managers) to suggest or request certain things from companies. Of course, the ability for equity investors to engage companies ESG policy is proportional to their stake. For example when Larry Fink, CEO of the world's largest asset manager, Blackrock, sends out his annual (public) letter to the CEOs of his portfolio firms, they take notice. In his 2021 letter, Larry Fink states:

> "...we are asking companies to disclose a plan for how their business model will be compatible with a net zero economy – that is, one where global warming is limited to well below 2ºC, consistent with a global aspiration of net zero greenhouse gas emissions by 2050. We are asking you to disclose how this plan is incorporated into your long-term strategy and reviewed by your board of directors" (Blackrock 2021).

This request, along with letters from the last few years, has been taken as a sign that ESG has gone mainstream. Surely, the world's largest asset manager asking firms to take action is evidence of finance contributing to stopping climate change. A more critical reading, however, notes that Blackrock is not requiring immediate action - like reduction of CO2 - but for *disclosure* of *a plan* about how the *business model* will be *compatible*. In short, it is about plans, not specific actions that can be measured, and plans regularly fall short. Moreover, equity investors' interest in learning more about firms' ESG-related plans allows investors to better understand their risk exposure to climate change; arguably a more important motivation for them than impacting climate change.

Rating Agencies

Rating agencies are central to the ESG investment process as they are a key source of information for creating investment products and for making investment decisions. This centrality makes ESG ratings a lucrative field for established and new rating agencies alike and has spawned a large number of operations. There are about 600 ESG-related rating agencies today and while the UN started a "rate the raters" effort in 2017, it stopped due to the challenge presented by the sheer number of agencies (Georg Kell, one of the founders and former Executive Director of the United Nations Global Compact, in conference #1). This makes the ESG rating sphere very different from the well-established company credit rating industry dominated by two giant incumbents, Moody's and Standard & Poor's. While Moody's and Standard & Poor's ratings differ in their assessment of a specific firm's risk, their ratings are well-understood, as are their different methods and differences in their results (see Caridad et al. 2020).

In contrast, ESG ratings from different agencies for the same firm or financial product tend to be extremely diverse due to the lack of data and missing standards across a broad spectrum of ESG topics. As a result rating approaches can differ in terms of scope (what is measured), weighting (which part is weighted how much), and reliability (see Hughes et al. 2021). More specifically a recent analysis of six leading ESG rating agencies by Berg et al. (2020) show that (1) the number of categories used ranges from 38 to 282 and (2) the correlation between final ratings is on average only 0.54 (Hughes et al. 2021 find even lower integration). This divergence causes a number of problems for ESG investing. First, investors do not know which firms or products are the best performing in terms of ESG criteria and thus prices of these assets are less informative. Conversely, companies interested in changing their behavior to improve their financing prospects get unclear signals and therefore might refrain from action (see Berg et al. 2020; Gibson et al. 2019).

Another challenge for ESG investing (particularly for retail investors) is understanding that ESG ratings are mostly about risk rather than a measure of how "green" a company might be. Morningstar notes that "ESG Risk Ratings measure the degree to which a company's economic value is at risk driven by ESG factors" (Morningstar 2021). In other words, a high ESG rating means that a company has little exposure to a specific risk, e.g., increasing costs for CO2 emission rights, but does not mean

that it has a positive impact on the environment. Morningstar only recently began offering metrics on “ESG Commitment Levels” that provide an “evaluation of investment strategies and asset managers from an environmental, social, and governance perspective” (Morningstar 2020). However, even this metric is mostly about the inputs to investment decisions with few if any focus on actual outcomes or changes in firms’ impact on the environment. As a Bloomberg Businessweek report on the ESG rating practices of Morningstar states, “[...] ratings don’t measure a company’s impact on the Earth and society. In fact, they gauge the opposite: the potential impact of the world on the company and its shareholders. MSCI doesn’t dispute this characterization. It defends its methodology as the most financially relevant for the companies it rates” (Simpson et al. 2021). Similar remarks such as “our business is to support investment decisions” were made by rating industry representatives at the events we attended (conferences 1, 4).

Even more serious than the difference in measurements between rating agencies is the practice of amending data. Berg et al. (2021) analyzed the work of a key rating agency, Refinitiv ESG (formerly ASSET4), and showed that it frequently changes its historical data and historical ratings. That means that the 2016 ESG score for a firm that was available in 2018 is different than if one used the same score today. These score changes occur without notification, and happen frequently and massively. For example, within one six week-period, Berg et al. (2021) find that 86 percent of the historical rating scores have changed, along with 6 percent of the raw data - such as the amount of CO2 emitted in a peculiar year (Berg et al. 2021). While changes in the most recent data might reasonably occur, such as when firms re-state their reportings, it is very unlikely to happen at this speed, and for many years back.

This begs the question of why would a rating agency do this? The answer might be found in the underlying incentive structure for ESG ratings: Differing from the credit rating model, where the rated firm pays in order to gain access to credit, the ultimate users of the ESG ratings – banks and institutional investors (mutual and pension funds) – are the ones paying. Thus, rating agencies have strong incentives to demonstrate the usefulness and relevance of their data for investment decisions (similar behavior has been documented for equity analysts, see Ljungqvist et al. 2009). As Berg et al. (2021) show, the restated ESG scores are much better at predicting historical stock prices (i.e., in retrospective testing) than the original scores, which had little or no correlation with share price developments. Thus, the restatement of historical rating scores provides a compelling picture for the bank and institutional investors who are the agencies’ customers.

All these issues – radically different methodologies between agencies, variance in scores for the same company, measuring exposure to ESG-related risk rather than environmental impact and post facto edits of data to fit historical price data – raises serious questions about the usefulness of ESG ratings to steer investments in ways that can help stop climate change.

Banks

Christian Sewing, the CEO of Deutsche Bank, the largest German bank, talked publicly with remarkable openness about Deutsche Bank's role in the transition process towards a greener financial system:

> "This transformation brings opportunities for us as a bank: [...our clients] need our advice; they need our products and solutions. Second, by being a frontrunner in ESG we will also be more attractive to investors in a fast-growing market. And finally, needless to say, society, like our clients, values it highly when we act as a responsible corporate citizen.
>
> [...] we see ourselves ideally positioned for this new environment. [...] And why that? We are producing the assets in-house that our clients demand - from originating and structuring, to designing and finally distributing them. We are ideally positioned on both sides of the balance sheet. Moreover, I see a competitive advantage for us because of our advisory capabilities. In the ESG world clients aren't as certain about what they want to buy. They need advice and transparency." (Deutsche Bank 2021)

This quote makes it very clear that Deutsche Bank looks at the green transition almost purely from a business perspective, as presumably most other financial players do. Even good-meaning individuals within banks seeking to address climate change face profit incentives that bring quarterly results (and associated bonuses) to the forefront of attention relative to the long-term rescue of the planet. After all, banks could easily demonstrate commitment to halt global warming by halting the financing of (new) coal, oil and gas exploration projects altogether. And almost no bank is willing to do so (Walker and Morris 2021).

Despite this mismatch in incentives, Bolton and Kacperczyk (2021) find nevertheless that banks joining the "Science Based Targets initiative" indeed cut lending in syndicated loans to less environmentally friendly firms. This has the welcome result of these firms working hard to increase their MSCI ESG scores within the next year. However, affected firms mostly boost their scores via communication efforts and do not do much else, especially they do not reduce emissions. Bolton and Kacperczyk (2021, p. 6) conclude: "Since such communication efforts do not lead to any changes in real emissions or plans to reduce them, they could simply reflect some form of greenwashing by such companies." In a subsequent discussion with the authors of this paper, one of the authors of the Bolton and Kacperczyk (2021) paper was doubtful that these kinds of voluntary measures by banks to cut lending would induce real change in behavior at the firm level.

Banks in general talk to their clients on a regular basis, and again, according to our interviewees, ESG topics have become a considerable part of these talks. Banks need to report their climate and ESG risks, as regulators want to prevent a major financial system's problem when bank's clients experience shocks either from climate, or, more likely, from regulation (such as car companies facing a very strong CO2 tax). For this, banks need to understand the ESG risk their clients face. Given the changing regulation and the mostly poor data availability on a firm level, these discussions take a lot of time. Talks between banks and firms involve current and future regulation, current and future risks, possible consequences for the firms, and possible mitigation strategies.

In practice, this means deeper relationships between banks and their clients, particularly as clients strategize about how best to finance transition that potential new regulation might bring. In fact, one of our interviewees stressed that this communication channel is the most important transmission function of climate finance. This is because during these talks, companies gain a better understanding that future financing costs will depend on their ESG score, CO2 emissions relative to their industry peers, and as a result, the availability of future financing might become problematic. As financing is vital for most firms, information and the urge to change is communicated broadly, and information about future regulation and thus financing possibilities is taken seriously by the firms. This heightened awareness on the client side can lead firms to track the necessary data and "nudge" clients into executing plans for energy savings that have been regarded as low-priority before (interviews 1 and 3).

Companies and their impact on the real world

Many investors subscribe to the view that green financing is there to finance green activities of firms. While this seems tautological, it is worth noting that this makes it possible for any green activity done by a firm to be attributed to green financing. In other words, green financing does not necessarily require firm activities to be (1) new initiatives and (2) only made possible by green financing. As a result, the claims for the impacts of green financing often include actions that go well beyond anything that was actually driven by it.

In order to be efficient, green funds need to be invested in a green way in the first place (high greenishness on the x-axis in figure 5). But even green investments only make a difference to climate change if the investment would not have been done without the green funding: If a new refrigerator is environmentally better than the old one and pays off by saving money due to lower energy consumption then a firm will buy it, no matter whether the funds used are labeled green or not. This attention "additionality" is key as the green funding needs to *cause environmentally* friendly activity (the star in the right upper corner in figure 5), or otherwise nothing changes in the baseline scenario.

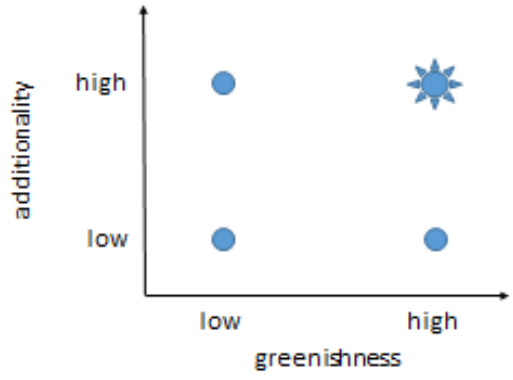

Figure 5: Additionality and greenishness of investments, source: own illustration

The additionality of any investment is hard to pin down, and there are not many incentives out there for financial players to show that it does or does not exist. In fact, managers of green funds complain – in unofficial statements in conferences – that

additionality is hard to actually measure, let alone control the changes caused by green funding that firms receive. The same is true for the United Nations Environment Programme, which writes in its Adaptation Gap Report 2020 (UNEP 2021, p. 25): "[...] the amount of funding for adaptation does not provide much information about efficient or effective use of these funds. To date, there are no universally agreed upon metrics to assess outcomes of adaptation finance or to measure the effectiveness of those funds [...]". One might have expected that this issue would have been addressed 15 years ago, when the first green bonds emerged, but it is only recently that the "real impact" of green funding has started to become a topic for investors and researchers alike.

In search for additionality, Kapraun et al. (2021) examined Bloomberg and Thomson Reuters Eikon databases of green bonds, which include a "use of proceeds description", information provided by the issuers themselves, information contained in the "second opinions", i.e. the rating agencies, and, finally information provided by the issuers' impact reports. They were unsuccessful in this effort, either because the information was too unspecific, not available, or very detailed but without any link to the financing. They conclude: "it is hardly possible for investors to retrieve any useful information on the real impact of a specific Green bond" (Kapraun et al. 2021, p. 23). A similar argument arises from a large literature review on investor impact by Kölbel et al. (2020, p. 2) who conclude: "Due to a lack of suitable metrics for investor impact, however, very few investors analyze how their activities cause companies to change. As a result, the majority of the USD 30 billion that are deployed in SI [sustainable investing] today (GSIA, 2018) is invested in ways that promise only modest and perhaps even negligible investor impact." In other words, while there are many studies on the financial returns of sustainable investments – a standard interest of normal capital markets – there are few studies on the actual impact of these investments on stopping climate change.

6 - Conclusion - When markets do not fail but governance does

Our detailed review here shows that neither the nodes nor the transmission channels stylized in figure 3 are very promising in addressing climate change. Investors and asset managers do not care much about the effectiveness of their investments vis-a-vis the climate, nor do they seem concerned about actual change at the firm level. Green financing structures, conceptualized as a cheap financing source for green investments, on average either display a very small return deduction (a "greenium" in terms of prices), or none. ESG rating agencies, tasked with bringing transparency and rankings to the process, exhibit great divergence between each other's ratings and are incentivised to manipulate data, the exact opposite of transparency. Green investing also results in very little change in firm behavior. Due to their structure and investment policies, green bonds and even more so, green equity funds, invest in firms or parts thereof that are green anyway, and finance many projects that would have been conducted anyway.

As a result, green finance is more accurately seen as a source of additional fees for the finance industry rather than a means of actual CO2 reduction (or similar good things for the environment). However, few of the people involved seem to care: Investors feel good, ESG rating agencies come into being and flourish, accountants, commercial and investment banks, asset managers etc. prosper, companies get (slightly) cheaper funding and a better image as do stock exchanges. Regulators are busy, politicians can showcase action and change, and last but not least, business schools are able to offer green investment classes, heart-warming case studies and

a good conscience. Everybody is happy. Only one thing is decidedly unimpressed: the earth's temperature, which continues to rise. So how might this move forward?

Seeming not via academic finance research. In a recent call for one of the leading academic conferences on "Energy and Climate Finance Research" papers on the following topics were solicited (see Figure 6). While there are many questions about ESG's effect on pricing and risk – finance's core – which are surely interesting and important to know, no topics are focused on the real implications and impact of climate finance. Academic financial research does not seem to be in the lead here. Another possible mechanism is investors' ability to influence firms through engagement at annual shareholder meetings, the corporate governance channel. For this to be effective, investors – owners or lenders – need to be large, effectively limiting this to banks or bond-investors, but not retail investors – even traditional activist investors usually own at least 1-2 percent of the shares of a firm before they start any action. This poses a difficult and fundamental tradeoff. ESG-activist investors seeking to drastically change a firms' operations towards environmentally friendly production – or towards less or no production at all – in all likelihood will suffer a hit in terms of the profitability of their investment. If environmental-beneficial changes were positive or neutral towards profit, firms would no doubt make the changes themselves to reap the public relations benefits. So, investors-activists, engaging with the firm, also seems an uphill path for driving substantial change.

2022 (Fourth) University of Oklahoma Energy and Climate Finance Research Conference

- The Financial Economics of Energy and Environmental Sustainability
- Assessing, Pricing and Managing Climate and Environmental Risk Exposures
- Asset Pricing Implications of Climate Change
- Capital Structure Dynamics and Payout Policies of Energy Companies
- Climate Change and Corporate Financial Policies
- Energy and Environmental Real Options
- Energy and Commodity Risk Management
- The Financial Economics of Fracking
- The Financial Economics of Sustainable Electric Power
- The Financial Economics of Energy Transmission and Storage
- The Financialization of Energy and Commodity Markets
- The Links between Energy/Commodities and Financial Markets
- Financing Renewable and Emerging Technologies including Hydrogen and Carbon Sequestration
- Carbon markets and Climate Derivatives
- ESG Ratings and the Measurement and Disclosure of Environmental Performance
- Natural Gas and LNG Financing and Markets
- Oil Export Revenues and Sovereign Wealth Funds
- Private Equity's Role in Green Energy Finance
- Privatization and Nationalization of National Oil, Gas, and Utility Resources
- Renewable Energy and Electricity Price Risk
- Taxation and Regulation of Energy Production

Figure 6: Questions solicited by a major climate finance research conference
Source: University of Oklahoma (2021)

How ESG finance might help addressing climate change

That said, there are some possible gains that might be made via communication from investors and lenders about expectations as this kind of "gentle persuasion" is perceived as a major functionality of "green capital markets" (interview 1). After all, capital markets and financial institutions, with "money flowing like mercury" (Clark 2005) reach the vast majority of firms in any economy and accompanying these financial flows are related input and questions about environmental impacts, ranging from the sincere to those driven by regulatory guidelines or simply efforts to tick the boxes. This in turn induces firms to gather information, e.g., about the amount of water used or CO2 produced, learn about investors' preferences and requirements, and as a result might finally start thinking about possible changes in the production process.

In short, if this type of input comes from large investors or banks, firms will more likely listen. After all, capital markets can effectively transport information and investor preferences to the firms. With this in mind, even a simple letter from the CEO of the world's largest investor, Blackrock, might spark something in companies' boards. In terms of preparing the financial sector for the risks from future regulation the action taken seems effective (although the ultimate proof will be in whether there is an ESG-related financial crisis in the future). Of course, this preparation is to a large part restricted to the financial sector and has only little spillover to real world impacts.

ESG investing itself is also not completely without merit: Even if asset managers just tick boxes and earn high fees, they still might channel funding to environmentally friendly investments. High quality projects with low returns might get green funding in situations where traditional funding would not be available. Likewise, high-quality green bonds can be a substantially cheaper source of financing. Thus, some could argue that the shortcomings of green finance outlined in the paper are due to a market still in its infancy, in its "wild west" phase, where things are (still) unregulated, many are confused about the right way forward, and best business and reporting practices have not settled yet. To this, we would counter, if we accept that the issues we identified are due to an underdeveloped market, surely then what is needed is a strong hand from the state mandating certain governance structures.

Indeed, shortcomings might be addressed in multiple ways: The recently adopted EU taxonomy could help classify funds according to their greenishness and actual impact, making outright lying about the greenishness of funds less simple, and providing investors and financial players more transparency about their investments. An ever-growing green capital market might increase the differential to conventional bonds and cheapen eco-friendly investments further. New, high quality players might emerge and as investors and players get more experienced, they might care more about impact and additionality – in the same way they started to care for green 15 years ago. Of course, as evidenced by the heavy use of the word "might", this is by no means a forgone conclusion.

So we still see some hope that green capital market efficacy and efficiency could improve. Better than simply hope, however, would be to stop waiting for the capital markets to do their magic with "sustainable finance" (see Kölbel et al. 2020) and instead focus on regulating firms directly. Unlike green capital markets, however, these regulations and restrictions are unpopular no doubt as they require real change rather than the semblance of change. As a result, regulations face strong lobbying resistance as they may produce (regionally concentrated) unemployment, shrinking

profits, or both. Politicians find it hard to advocate sacrificing today's jobs in the local electorate for the future benefit of the planet. But these regulations can be vastly more effective in inducing big changes than the illusion of action we have currently via "barely green" capital markets.

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