‘COS MONEY GROWS ON TREES:

THE INTEGRATION OF CLIMATE-RELATED RISKS INTO RISK-BASED SUPERVISION

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Introduction: *Why?*

"They shouldn't".

My colleague's response – entirely sincere, but delivered in a deadpan manner designed to amuse – raises a chuckle from the team. I join them, smiling at his answer to the question I've recited from my computer screen: "How can Climate-Related Risks be Integrated into Risk-Based Supervision?".

And while such a response might be viewed by some as an abdication of responsibility, it is a position reasonably common to regulators across the globe. It is also entirely defensible. The spiralling cost of energy,[1] and the social problems thereby created, serve to illustrate the dangers of immediate divestment from hydrocarbons (the source of the most obvious "climate-related risks"), and the need to maintain a relative equilibrium between supply and demand in the energy sector. In such an uncertain environment, the *right* of regulators, experts in neither meteorology nor macroeconomics, to usurp the market's decision-making power should itself be questioned. The dangers of overregulation must also be acknowledged, as must the tendency of regulatory reform to shift, rather than abate, a point of crisis:

> The entire history of Wall Street was the story of scandals, it now seemed to him, linked together tail to trunk like circus elephants. Every systemic market injustice arose from some loophole in a regulation created to correct some prior injustice. …the regulators might solve the narrow problem of front-running in the stock market by high frequency traders, but whatever they did to solve the problem would create yet another opportunity for financial intermediaries to make money at the expense of investors.
> (Lewis, 2014: 101)

Nevertheless, with 30 million people displaced by extreme weather events in 2020 alone (NRC, 2021), total inaction by policymakers now seems to carry an unconscionable human cost. Across the following few paragraphs, I will attempt to extend this responsibility to supervisors, and in doing so provide a rather longer rebuttal than my colleague imagined his remark might elicit.

Beginning its *Regulatory Framework* by asking "why regulate at all?", the Guernsey Financial Services Commission suggests that "Financial regulation addresses systemic as well as idiosyncratic risk" (GFSC, 2017: 6). Unconfined to smaller jurisdictions, this line of reasoning is also common to larger economies of less tempestuous fortune, and was recently included in the US Congressional Research Service's *Financial Regulation* report: "…regulation cannot eliminate all systemic risk, but it aims to keep it contained so that instability can be prevented" (Labonte,

[1] In April 2022, the BBC estimated the annual cost of energy in the United Kingdom to have risen by £693 per household after Ofgem's price limit revision (Peachey, 2022).

2022: 1). To volunteer the human displacement alluded to above as an example of 'systemic risk' would be both trite and inaccurate – akin to an economist voicing concern about the housing market in 2009, or a financier questioning the durability of stock bubbles in 1930. Risks, by necessity, are damaging events *yet to occur*. As even a cursory perusal of scientific publication will demonstrate though, future disasters are in no shorter supply than present ones. A recent study, for instance, projected that 150 million people will be entirely submerged during high tide by 2050, whilst 300 million will live at permanent risk of flooding (Strauss and Kulp, 2019: 3). The financial industry touts itself as an 'efficient' allocator of capital, a stimulant of economic growth, and even, on occasion, a purveyor of liberal values. Milton Friedman, perhaps this pecuniary faith's most zealous evangelist, famously argued that a free market would protect people from "being discriminated against in their economic activities for reasons that are irrelevant to their productivity – whether these reasons are associated with their views or their color" (Friedman, 1962: 21). Uniting libertarian economic policy with political liberty, he also sought to connect democratisation with economic freedom: "In Chile, the drive for political freedom, that was generated by economic freedom and the resulting economic success, ultimately resulted in a referendum that introduced political democracy." (Friedman, 2007: 342). It is a doctrine preached even by unconverted agnostics; Barack Obama, whose opening presidential term was often marked by criticism of Wall Street excess, begun his inaugural address with a tribute to the "unmatched" power of the market to "generate wealth and freedom" (Obama, 2009: 15).

But such ideas have fared better in the ivory towers of theory than the mean streets of practice. This is acknowledged in the GFSC's *Regulatory Framework*, which argues that the "financial crises of 1929 and 2008 illustrate starkly what can happen when market forces, abetted by lax public policy, are left to run their course" (GFSC, 2017: 9). Claims of total market efficiency have been undermined in recent years by a slew of mispricing; from the Dot-com bubble, to the collapse of luna/terraUSD, via the CDOs of the new millennium, financial markets of different flavour have each demonstrated themselves to be only partially efficient. In the aftermath of these asset bubbles, and the economic problems thereby provoked, the case for regulation has become uncontroversial. The power of markets to create "wealth and freedom", as espoused above by Friedman and Obama, is more dubious. Climate risk presents a severe example of mispricing and market inefficiency, as well as an egregious threat to the global economy. It is entirely systemic, leaving no corner of the world unthreatened, and is fuelled at least in part by the capital allocation of the financial sector. If supervisory duty is located in 'systemic risk' and asset mispricing, then climate change should be regarded in similar terms to the crises recounted above – as a catastrophic threat to the global economy, and the necessary

recipient of close regulatory attention. An unchecked market can destroy wealth as easily as create it, while the suggestion that "freedom" and liberalisation are *necessarily* resultant of marketisation is disrupted by the kleptocracy and state-capture of the post-Soviet CIS, among other regions.[2] And such problems are not confined to emerging, or newly privatised economies. The "nest of vipers"[3] uncovered on Wall Street, the Madoff Ponzi scheme, and the LIBOR manipulation scandal all attest to the ability of western financiers to profit illegally from a poorly supervised market. Unable to protect even the narrow interest of individual nations, unregulated financial markets seem a bizarre bet to save the entire world from climate Armageddon.

The importance of multilateralism – described recently by the UN's Climate Change Executive Secretary as "the world's vehicle for addressing climate change" (Espinosa: 2022) – is perhaps the most common refrain of such debates. Indeed, it obvious that little can be accomplished by the actions of individual nations, especially those least responsible for the plethora of climate risks threatening financial and human prosperity. But in a geopolitical environment defined by conflict – manifested in cold wars, hot wars, vaccine nationalism and economic belligerence – demands for internationalism seem silly and unrealistic. In the absence of meaningful cross-border cooperation on anything else, multilateralism seems as bizarre a stand on which to hang one's hat as an unregulated financial market. Rather, demands for internationalism protect the right of individual nations and institutions to do nothing without incurring public scrutiny: *we'll do it when they do it*.

In the absence of this desired multilateralism, then, a unilateralism of the powerful and rich must emerge. And the extension of this doctrine to supervision speaks to the simplest, but perhaps also the most compelling, argument for the integration of climate-related risk into risk-based regulation: *we'll do it 'cos no one else will.*

[2] See *Kleptopia* by Tom Burgis for a more detailed analysis of this.
[3] The term given by Judge Gerald Goettel to the network of inside traders uncovered by US prosecutors in the mid-80s, which most prominently included billionaire Michael Milken.

A New Regulatory Framework

The importance of accurate information in the analysis of financial institutions is obvious enough not to merit a prolonged discussion. And yet regulatory organisations across the world collect little data on climate related risks, especially by comparison to the volume required by financial crime and prudential supervisors. Perhaps the clearest starting point in this respect is with greenhouse gas emissions, the most immediate, and the most quantifiable, climate risk.

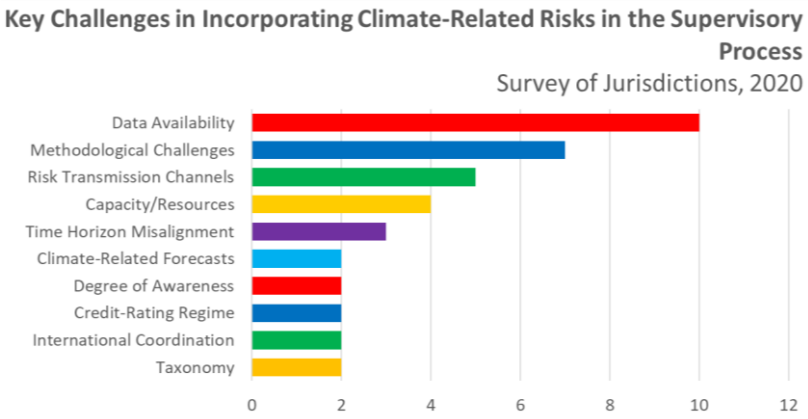

Figure 1: Data Challenges

> Without mandatory disclosures on science-based targets, companies will always cut corners.[4]

If publicly traded companies were required to make emissions disclosures alongside financial ones, these emissions might be more accurately priced into capital markets. The possibility of companies understating these figures – an objection raised to the SEC's proposal on Scopes 1, 2, and 3 emissions disclosures[5] – could be addressed with mandatory audit, akin to that required of financial statements. Branches of "climate auditors" might emerge across accounting firms, increasing the compliance burden on financial institutions, but alleviating the kind of asset mispricing linked to capital misallocation by Alti and Tetlock (2011).[6] The reputations of large accounting firms, so tainted by the failures of the twenty-first

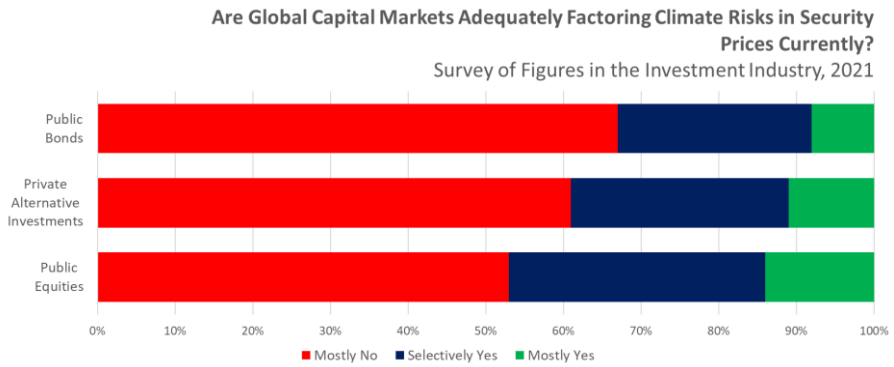

Figure 2: Asset Mispricing and Climate Risk

[4] Quote from industry figure included in KPMG's "Can Capital Markets Save the Planet?" report (Rajan, Cowell, and Kelly, 2021: 18).

[5] See Thornton and Phillips (2022) for a discussion of the prospective rule change, and an objection to the principle of "materiality".

[6] As novel as this suggestion might initially seem, it is not without precedent. In 2021, the IFRS announced the creation of the International Sustainability Standards Board, intended to produce global standards of sustainability disclosure akin to those of IASB for financial reporting. Specialised 'climate auditing' is obviously an extension of this, but not an entirely different concept.

century, could certainly benefit from this more positive association. And with superior allocation comes superior growth, and wealth creation, which could be directed to the betterment of society. As can be observed in Figure 2, the industry itself does not believe climate pricing to be reliable.

But more efficient pricing of assets does not mean divestment from ecologically damaging activities. As discussed earlier, such divestment is essential, and can only be ensured with statutory, not market, authority. Regulators could demand similar disclosures of larger[7] privately-owned financial institutions, and create an "impact" model based on the volume of scope 1, 2 and 3 emissions declared by each firm. A supervisory model – founded on *proactive* regulation of more "impactful" institutions, and *reactive* oversight of smaller ones – could accordingly be imported from the prudential frameworks of national regulators into climate supervision. Divisions centred around climate-risk supervision could be established at larger regulators, like the SEC or the Bank of England, and this impact model could thus become more nuanced over time, incorporating a greater range of climate risks, though the design of such a system is beyond both the scope of this essay and the scientific acumen of its author.

The establishment of a "climate team" with the requisite ecological credentials would obviously be more challenging in some jurisdictions than others; expertise could thus be lent from richer nations to poorer ones. These teams would seek to control the "macro-ecological" risk created by the financial system's capital allocation in a manner similar to existing macro-prudential supervision, while scrutinising larger deals on an individual basis. Any firm whose "climate impact" rating reached a certain level would be obliged to appoint a "climate compliance officer", tasked with regulatory reporting, and the implementation of any supervisory action imposed on the firm. And the recruitment of scientifically literate supervisors (as well as the "climate auditors" discussed above) would be made possible both by the salaries offered in the financial sector, and the opportunity to make a more tangible impression on the climate struggle than is afforded to most in the laboratory.

The SEC's mooted rule on emissions disclosure is an important starting point, but should be extended to the private market. Most significantly, judgement of the figures disclosed should fall under regulatory duty, as well as commercial. The framework described above might seem excessively radical, or overly divergent from the existing supervisory model and the

[7] It seems unlikely that all financial institutions would have the resources to comply with large scale mandatory climate disclosure. Initially, therefore, the requirement to disclosed would be based on financial measures like revenue, and total assets, with a more sophisticated model of tiered disclosure constructed in due course.

purpose regulators envisage for themselves. But the introduction of greater scientific acumen to the financial system – through climate auditors, climate compliance officers, and specialised climate-risk supervisors – might solve the data collation problem viewed by many as the most significant impediment to climate-risk supervision. With greater expertise would come a better understanding of the data required, and an ability to draw conclusions therefrom. Auditors and compliance officers, carrying similar liability to their pecuniary counterparts, would ensure the "truth and fairness" of any disclosures made, making 'greenwashing' exponentially more difficult. Even viewed through the myopic lens of capital market mispricing, climate risk is an issue of regulatory concern; for the reasons discussed in the introduction of this essay, it must become a regulatory *obsession*.

Of Carrots and Sticks

> In the US, there is no environment in which ESG investors are incentivized.
> (Industry figure – Rajan, Cowell, and Kelly 2021: 14)

Most of the regulatory incentives designed to promote "green" investment rely predominantly on marketing. As with the SEC's disclosure proposal, this is a reasonable strategy, and certainly has its place in the supervisory toolbelt; the Guernsey Green Fund for example, inaugurated by GFSC in 2018, has since attracted over £4.4bn of assets, which the Commission concluded in its most recent review were being "invested properly in appropriate assets" (GFSC, 2021: 33). Alternatively, enough money has been raised by these Green funds to install around 5300mW of solar capacity (around 0.47% of the United States' entire generative capacity).[8] Evidently, then, there is power in these designations, with access admitted to capital that might have otherwise been difficult to procure. Innovations have also been made in the regulation of banks, with the Bank of England, for instance, now requiring its licensees to "incorporate climate risks into their risk appetite framework and overall business strategy, report data that reflect their exposures to environmental and climate-related risks, and take these risks into account in all relevant stages of the credit-granting process" (Demekas and Grippa, 2021: 16). Insurance has similarly shifted, with the European Commission having recently launched its 'sustainable finance package', with measures included compelling insurance providers to assess climate risk (16).

[8] Figures are calculated with data from the United States Energy Information Administration and the Solar Energy Industries Association, using exchange rates as at 25/07/2022.

While such shifts are certainly positive, though, the necessity for ecological investment will not be so easily satisfied. None of these measures carry either a coercive power, or incentivise more ecologically responsible finance. Regulators, thus far, have largely declined to make use of either the carrot or the stick, as the industry (represented in Figure 3), waits for them to wield both. Decision making power remains entirely with the market, which as already discussed, is limited in its ability to affect positive outcomes. Harder incentives, whether negative or positive, are required. Governments across the world have been largely uniform in their rhetoric, warning of the dangers of inaction. Indeed, the Paris Agreement, of which 192 countries are currently signatories, contains a provision that all parties make "finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development" (United Nations, 2015: 3). In the absence of such action, the mandate to fulfil this contract has been effectively delegated to regulatory authorities, without the power of traditional incentives like taxation, available only to legislatures. Despite this, though, the power of regulatory incentivisation remains considerable, and whether bolstered or not by governments, an array of options is already available to supervisors.

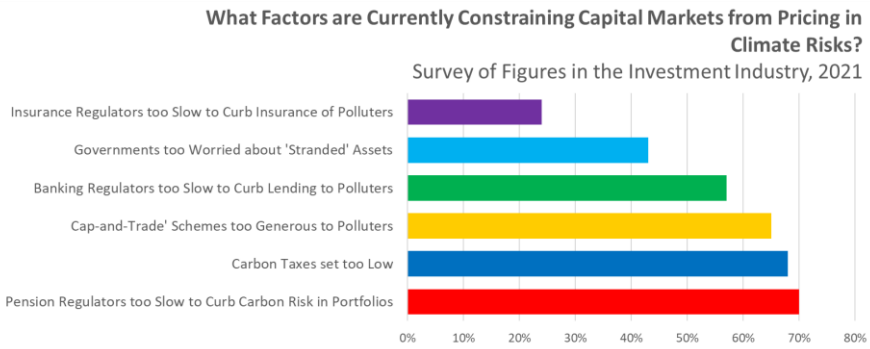

Figure 3: Climate Risk and Regulatory Inaction

Capital requirements are perhaps the most obvious tool through which this could be achieved. Ecologically damaging lending or investment practices could be penalised through capital adequacy deduction, while greener investing could be allowed at greater degrees of leverage. This would artificially increase rates of return on environmentally friendly assets, while disincentivising 'brown' sector investment, by requiring that they be supported by a greater degree of capital. 'Brown' assets would not be excluded entirely from capital calculations, but could rather be penalised by a modifier of some sort. The fractional reserve system, generally falling inside the bailiwick of central banks, could also be used to steer the flow of capital in a more favourable direction. Similarly to the capital requirement strategy, this permits ecological lenders to be more aggressive, curbing the flow of money to climactically damaging asset classes. Reserve requirements would therefore be specific to particular banks, whose ecological performance would be graded by the bespoke supervisory teams described in this essay's previous chapter. Any monetary expansion resultant of lowered reserve requirements at certain

banks would be offset by the contraction created by increased rates at others. Likewise, increases in systemic risk affected by modified capital and liquidity rules would also be offset by the more stringent standard demanded of 'brown' investors. Financial risk would thus be redistributed, rather than created, with environmentally-friendly banks, funds and insurers allowed to take on more at the expense of their competitors. Such a system could also be glossed as a form of 'risk-budgeting'; institutions who take excessive environmental risks would be forced to offload financial risk, and the opportunity for reward to which it is attached.

Perhaps most controversially, central bank offered rates could be used in a manner similar to the fractional reserve model I have discussed above. In almost all cases, this would require legislative consent, and so is rendered unfeasible as a supervisory initiative in the short term. Practically, though, it would be of little economic consequence, with expansionary 'easy' money offset by the higher rates offered to less ecologically benevolent institutions. With scope 3 emissions – and other forms of indirect environmental abuse – captured in the metrics discussed above, the impact of these reforms would far exceed the narrow circle of banks and institutions at which they are ostensibly aimed. Both debt and equity would become more expensive for polluters, while an ecologically unfriendly fund would necessarily bear greater administrative and custodial costs than a "green" counterpart. The central bank's duty to promote financial stability through control of interest rates could be a powerful method of curbing undesirable investment, and could be justified by the obvious threat to that stability presented by climate Armageddon.

The range of crises recounted in the introduction demonstrates, among other things, the susceptibility of financial markets to short termism. This is, if you'll pardon the pun, a long-term issue, not to be easily resolved. In the absence of such a change then, regulators should consider how short-term incentives might be created for sustainable investment. The ideas suggested above represent a radical departure from both the traditional sphere of regulatory concern, and the intended purpose of powers such as capital and liquidity requirements, and the central bank offered rate. And yet their use here is entirely justifiable. In controlling the 'brown bubble' of mispriced, polluting assets, regulators are certainly encouraging financial stability, and preventing the inevitably grim downturn at its bursting, a recession of both economic and humanitarian consequence. As one participant in the "Can Capital Markets Save the World?" study suggested, "Capital markets can help to save the planet. But left to their own devices, it will not happen." (Rajan, Cowell, and Kelly, 2021: 21) – supervisors, possessed of carrots and sticks aplenty, must now ensure that it does.

The Public and the Private

One of the more intimidating aspects of climate crisis is the sheer volume of money required for its resolution. The United Nations estimates that net-zero emissions could only be reached by 2050 through the annual investment of at least $4tn into renewable energy until 2030 (Guterres, 2022). Neither the political will, nor the fiscal power, exist for governments to reach this number alone, and so the deficit must be filled by investment from the private sector. NextEnergy Solar Fund Limited, one of the aforementioned Guernsey Green funds, is an example of how such investment might manifest. Concentrating on eponymous solar energy assets, the fund has total capacity of 865mW, and accordingly spares the planet 328,700 tonnes of carbon dioxide emission every year. With installation costs running well into the hundreds of millions (the fund's most recent net asset value was calculated at £668.5mn), it is difficult to imagine a beleaguered government, subject to the competing demands of its citizens, spending money so freely (NextEnergy, 2022: 1).

Of course, the scheme's owners are not entirely altruistic; it pays a regular dividend, and is traded on the London Stock Exchange, through which its shareholders can also profit from price appreciation. Rather, its success, as with many of its counterparts across the world, serves to illustrate the promise of sustainable finance, as an instrument of both economic growth, and ecological salvation. Green investment saves money, but is an underused reserve, as can be observed in Figure 4.

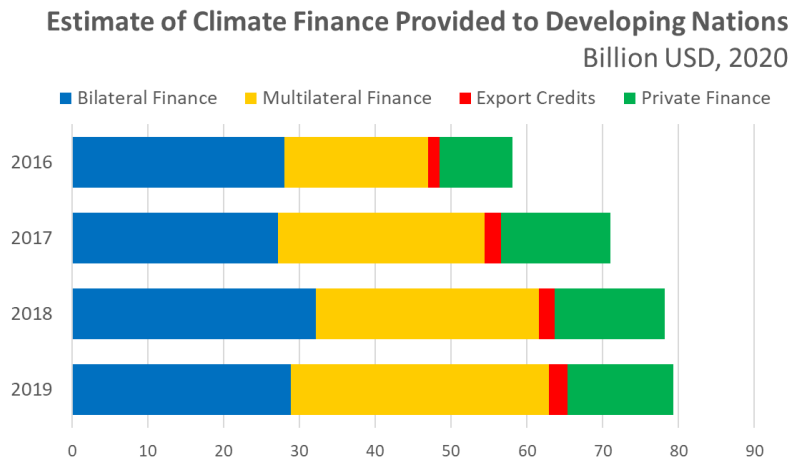

Figure 4: Dearth of Private Finance

A resource of much greater abundance than public money, private capital operates only through incentivisation, which evidently is not present in sufficient quantity. As well as providing a route to profitability, any such incentives must be sufficient to overcome the opportunity cost of investing in other assets, necessitating more radical action than the paperwork thus far created by regulators. The regulatory interventions suggested in the previous section might carry a significant cost, but surely remain less severe than the multiples of billion otherwise demanded of the public purse. And the cultivation of domestic renewable energy is also geopolitically valuable in an increasingly uncertain world, as the crises of this present year have demonstrated.

For the reasons outlined above, it should be the aim of regulators and governments to incentivise private investment into green assets of every guise. In doing so, a class of investment professionals specialising in sustainable finance might also be created, in anticipation of the enormous demand that will materialise for such products as fossil fuels run scarce and temperatures rise. Fears of 'green bubbles', much mooted recently (Naumann, 2021), bely both the fundamental short termism of traditional asset pricing models (which undervalue the inevitability of an eventual green economic transition), and the utility of such a bubble. Rapid appreciation of green assets means greater investment, while the implosion of any bubble would be mitigated by the natural floor in demand for energy assets, and the gradual depletion of fossil fuels. In any case, the macro-prudential challenge of a 'green bubble' bursting is surely more surmountable than the devastating effect of unchecked global warming. Ultimately, the direction of private investment into ecologically beneficial projects would undoubtedly be the least expensive way by which the funding gap between climate Armageddon and deliverance could be filled.

Conclusion

Entirely divergent from the traditional responsibilities of prudential supervisors, combating climate change is a topic both intimidating and controversial. Believed by many to reside outside the regulatory remit entirely, the threat of unabated global warming is such that total inaction seems increasingly unviable. Having formally agreed to "make finance flows consistent with a pathway towards low greenhouse gas emissions", national governments have implicitly delegated a degree of this responsibility to regulators, already possessed of a range of tools with which to influence the capital markets.

With the recruitment of scientifically literate employees, regulatory authorities could significantly improve their oversight of climate data, as well as their ability to draw conclusions therefrom. The mandatory audit of these disclosures, meanwhile, could give rise to a newly specialised class of auditor, tasked with ensuring the honesty of environmental reporting, and the preclusion of greenwashing. Within this framework, supervisors could use impact and risk metrics imported from traditional prudential supervision to establish a probability weighted system of climate regulation, rewarding entities which reduce their environmental impact with the means discussed and penalising those who do not.

The ultimate aim of this system, the direction of privately invested capital into greener assets, is also a divergence from traditional regulatory duty, in its favourable treatment of a

particular asset class. But confronted by scientific consensus, and the apocalyptic vision of a drowned planet, the time has come for deviation from the orthodox. If, as is commonly protested, the role of the regulator is to control systemic risk, challenge the worst impulses of the market, and ensure that the financial sector works for the betterment of society, then the obligation to act is clear; *'cos money grows on trees*.

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Cover Image: "Micheile dot com". *Green plant on brown round coins*. Unsplash, 2020.

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