STRANDED ASSETS PROGRAMME

SMITH SCHOOL OF ENTERPRISE AND THE ENVIRONMENT

UNIVERSITY OF OXFORD

Financial Dynamics of the Environment: Risks, Impacts, and Barriers to Resilience

Working Paper for the UNEP Inquiry

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Inquiry: Design of a Sustainable Financial System

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About the Inquiry

The Inquiry into the Design of a Sustainable Financial System has been initiated by the United Nations Environment Programme (UNEP) to advance design options that would deliver a step change in the financial system's effectiveness in mobilizing capital towards a green and inclusive economy.

Established in January 2014, it will publish its final report in the second half of 2015. More information on the Inquiry can be found here: http://www.unep.org/greeneconomy/financialinquiry

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About the Stranded Assets Programme

Stranded assets are assets that have suffered from unanticipated or premature write-downs, devaluations or conversion to liabilities and they can be caused by a variety of risks. Increasingly risk factors related to the environment are stranding assets and this trend is accelerating, potentially representing a discontinuity able to profoundly alter asset values across a wide range of sectors.

Yet environment-related risks that could strand assets are poorly understood and regularly mispriced, resulting in an over-exposure to such risks throughout our financial and economic systems. Some of these risk factors include:

- Environmental challenges (e.g. climate change, natural capital degradation)
- Changing resource landscapes (e.g. shale gas abundance, phosphate scarcity)
- New government regulations (e.g. carbon pricing, air pollution regulation)
- Falling clean technology costs (e.g. solar PV, onshore wind, electric vehicles)
- Evolving social norms (e.g. fossil fuel divestment campaign) and consumer behaviour (e.g. certification schemes)
- Litigation (e.g. carbon liability) and changing statutory interpretations (e.g. fiduciary duty, disclosure requirements)

The Stranded Assets Programme at the University of Oxford's Smith School of Enterprise and the Environment was established in 2012 to understand these risks in different sectors and systemically. We research the materiality of environment-related risks over time, how different risks might be interrelated and the potential impacts of stranded assets on investors, businesses, regulators and policymakers. We also work with partners to develop strategies to manage the consequences of environment-related risks and stranded assets.

The Programme is currently supported by grants from: The Ashden Trust, Aviva Investors, Craigmore Sustainables, European Climate Foundation, Generation Foundation, Growald Family Fund, HSBC Holdings plc, The Luc Hoffmann Institute, The Rothschild Foundation, The Woodchester Trust and WWF-UK. Our research partners include: Standard & Poor's, Carbon Disclosure Project, TruCost, Ceres, Carbon Tracker Initiative, Asset Owners Disclosure Project, 2° Investing Initiative, Global Footprint Network and RISKERGY.

About the Authors

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Working Paper Series

This Working Paper is intended to stimulate discussion within the research community and among users of research. The views expressed in this paper represent those of the author(s) and do not necessarily represent those of the host institutions or funders.

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Table of Contents

Executive Summary

This Working Paper was commissioned by the UNEP Inquiry into the Design of a Sustainable Finance System ("the Inquiry") to feed into its process of analysis and knowledge dissemination. This Working Paper has attempted to do three things: first, summarise the underlying logic for why the financial sector should care about the state of the environment and environment-related risks; second, review the main structural barriers that could prevent the financial system from managing such issues; and third, identify the main researchers and organisations undertaking work on these topics internationally. The aspiration being that this document should be a useful initial reference guide to those concerned with both how environment-related risks could affect the financial sector and what financial institutions can do to manage such risks.

We have attempted to provide, within a limited amount of time, a broad and balanced overview of these issues. We cannot claim that this review is exhaustive, but we hope that it makes a meaningful contribution to the process of identifying, consolidating and presenting the best work being done on these topics. Based on our review we have found the following:

- The available literature has focused predominantly on OECD countries and comparatively little research exists for emerging economies and developing countries. This is unfortunate and should be an area of great significance for future research.

- It is clear that financial institutions hold divergent perspectives on the materiality of environment-related risks to current and future value. Natural capital underpins the health of global economic and financial systems, however, these contributions remain largely unpriced within the economy and are largely absent from the balance sheets of financial institutions, and metrics quantifying economic growth.

- Environmental change, natural capital depletion and degradation could potentially pose systemic risks to financial stability; however, the processes through which this may happen are currently unclear and may be remote. Though we find little evidence to suggest that environment-related risks currently pose a systemic risk to the financial system beyond large-scale natural catastrophe events, there is growing evidence that these risks are becoming increasingly material and will figure significantly in financial valuation in coming years.

- Public policy responses to environment-related risks also have the potential to impact the financial system and financial stability. These include through monetary and fiscal policy responses to environment-related risks in commodity markets, environmentally-motivated trade policy (including export restrictions), as well as more direct environmental control policies.

- Due to their spread of investments and activities across sectors and geographies, the indirect exposure of financial institutions to natural capital risks may have equally costly impacts on balance sheets and system function than those firms with clear direct linkages to natural capital value.

- Accounting for environment-related risk in the financial sector involves a range of uncertainties and variables which can makes assessment complex. At a higher level, key metrics used in valuing economic growth (such as GDP) are not very useful in illustrating economic costs of drastic environmental change. Addressing these issues is a priority for informed financial sector decision-making.

- The phenomenon of short-termism in financial markets undermines the ability to invest and manage risk with due consideration for environmental-related risks. It is driven in part by the practices and regulations that govern financial institutons. These include short-term benchmarks for performance measurement, risk management, reporting and compensation along with other factors such as

decreasing CEO tenure, but also in the realm of financial regulation with the application of mark-to-market accounting practices, liquidity requirements, and insufficiently granular risk-based calibration and modelling.

- A number of major financial and investment policies unrelated to facilitating a transition to an environmentally resilient economy, are widely accused of being structured in ways that have unintended consequences on the ability of the financial sector to participate in this economic transition. These include Solvency II, Basel III, EU unbundling regulation and certain accounting regulations and standards. At the same time, sparse empirical evidence exists to support some of these claims, possibly because it is difficult to model the impacts of regulations which are under development and in varying stages of implementation, or to distinguish between transitional and permanent effects, as well as the type of market or region that may be affected.

- The lack of a mandate for companies to integrate ESG factors in decision-making, undertake materiality assessments or disclose environment-related risks hinders both consistent understanding of the issues and the ability to mitigate risks.

- The interpretation of fiduciary duty has evolved significantly over time and must continue to evolve to adjust to changing social and economic realities. Fiduciary duty is often cited as an obstacle to incorporating ESG factors into the investment process. The argument that ESG-inclusive investing is inconsistent with fiduciary duty is based on the premise that including ESG factors in investment decision-making would compromise returns to achieve extraneous social or environmental objectives.

- In recent years, major analytical research efforts have been aimed at quantifying and describing the nature of some of these above-mentioned issues and proposing solutions, from short-termism in financial markets to drivers of and responses to asset stranding. As more data and research become available and as the environmental sustainability agenda becomes integrated with the broader long-term investment agenda, potential for meaningful and catalytic change exists.

Introduction

This Working Paper was commissioned by the UNEP Inquiry into the Design of a Sustainable Finance System ("the Inquiry") to feed into its process of analysis and knowledge dissemination. The paper is intended to support three outcomes. First, to provide an overview of why the financial sector should care about the state of the environment and environment-related risks. Secondly, to summarise the main structural barriers that could prevent the financial system from managing such issues. Thirdly, to provide an up-to-date literature review of the work key researchers and organisations are undertaking on these topics internationally.

We have attempted to provide, within a limited amount of time, a broad and balanced overview of these issues. We cannot claim that this review is exhaustive, but we hope that it makes a meaningful contribution to the process of identifying, consolidating and presenting the best work being done on these topics. It should also be a useful reference guide to those concerned with how environment-related risks could affect the financial sector and what financial institutions can do to manage such risks. The authors and the Inquiry both welcome feedback and comments on this and related work, so as to improve future iterations.

Part I: Why the financial sector should care about the environment and environment-related risks

This section provides a summary and evaluation of leading work on the ways in which the state of the environment may impinge on the value and stability of financial assets, institutions and systems. We discuss recent thinking around environment-related risks, and particularly the degradation of natural capital (air, climate, soils, water), and how this has affected or could affect financial value and stability. This is examined at both the micro (firm-level) and the macroeconomic level, for example through impacts on growth, inflation, trade, and markets. Finally, this section outlines specific examples from the literature where responses to environment-related risks and natural capital degradation could affect financial value and stability.

Key findings

- Natural capital underpins the health of global economic and financial systems, however, these contributions remain largely unpriced within the economy and are largely absent from the balance sheets of financial institutions, and metrics quantifying economic growth.
- Based on a review of the available evidence, we conclude that environmental change, natural capital