

AN INITIAL ANALYTICAL FRAMEWORK AND RESEARCH ROADMAP: IMPLICATIONS OF GREEN FINANCE FOR THE COST OF CAPITAL, EMPLOYMENT, AND GROWTH



In support of the G20 Green Finance Study Group

This input paper has been prepared by the authors as a contribution to the G20 Green Finance Study Group (GFSG) but has not been endorsed by it nor does it represent the official views or position of the GFSG or any of its members.

The note was prepared by Apostolos Apostolou, Martin Cihák, and Michael Papaioannou (all Monetary and Capital Market Department, IMF), with useful inputs and comments from other IMF staff and GFSG members. It builds on previous work by IMF staff on climate change (After Paris: Fiscal, Macroeconomic, and Financial Implications of Climate Change, IMF SDN/16/01, January 2016). The note reflects work in progress and is intended to elicit comments and to encourage debate. The views expressed here do not necessarily represent the views of the GFSG, IMF, its Executive Board, or IMF management.

The co-chairs of the G20 Green Finance Study Group (GFSG) asked IMF staff to contribute to the development of a general analytical framework and a research roadmap on implications of green finance on the cost and allocation of capital, employment, and economic growth. The note covers these issues, without analyzing other potentially relevant topics, such as any financial stability implications.

I. Initial Analytical Framework

Fully internationally comparable data on ‘green finance’ may be difficult to obtain in the short term, presenting a challenge for empirical analysis. Despite recent progress, it is challenging to find reliable data on ‘green finance’ that would be comparable across countries and over time. This reflects in part a need to further clarify the underlying definitions of ‘green’ vs. ‘brown’. Green finance is a broad concept that covers financing for mitigation and adaptation projects. The concept relates not only to clean air and carbon footprint of investments, but also for example to biodiversity and sustainable water treatment, among other things. Definitions of green finance vary from country to country, and what might be a sensible technology in one country may not apply to others. For example, assessing whether nuclear energy, natural gas, and biofuels are ‘green’ or ‘brown’ is not straightforward. The focus at this stage is therefore on clarifying the overall conceptual framework and performing an initial analysis, while recognizing the data limitations.

A. Effects on Cost and Allocation of Capital

The mobilization of private funds for green projects can affect financial market costs and has implications for capital allocation. The analysis should provide insights on channels through which green finance affects capital allocation, quantify the costs and measure the impacts on growth and employment.

Green finance initiatives entail country-specific approaches, and their effectiveness should be analyzed within an integrated, country-specific framework.¹ Financial market developments would vary significantly among countries. In developing countries, policies to promote green finance could assist the financial sector and individuals self-insure against natural disasters through savings or insurance, and hedge against weather risks.² In advanced economies, the effects of green finance initiatives by the public and private sectors can be relatively more complex. The analysis of the impact of measures to accelerate green finance can proceed where data exists, such as renewables and clean technologies, and on a country case basis. Limitations to cross-country data should not be a constraint on promoting green finance in domestic markets.

Banking sector’s incentives to allocate capital efficiently to green projects should be examined. Commercial banks—and investors more broadly—will allocate high amounts of capital to ‘brown’ projects and insufficient to ‘green’ projects, if they continue to face prices that do not reflect the impacts of climate-related risks and possible global and local regulatory changes supporting a green economy. However, since climate change and related regulations involve large uncertainties and

¹ For example, carbon pricing (comprehensive, predictable, and with prices in line with environmental objectives) is considered to assist in efficiently allocating green investments.

² IMF staff is undertaking analytical work on growth and resilience in small island countries (mostly developing economies) facing frequent natural disasters. This analysis can provide useful additional background.

could increase the costs of financing both for 'brown' and 'green' projects, banks need to measure the efficiency of their capital allocation and be incentivized to provide green financing.³

The role of the green bond market and green stock indexes in guiding green investment decisions should be analyzed. The effectiveness of green bonds should be examined within an overall framework for green finance to mobilize green investments and assist in better designing green bonds' features that align investors' returns with the efficiency of green projects. Green indexes should also be analyzed within an overall framework for green finance to inform investors' asset allocation decisions, help benchmark asset returns, and provide a larger asset class for efficiently allocating capital for green finance.

Institutional investors' role in investing in green projects and divesting from high carbon footprint securities could affect the cost of capital for 'green' and 'brown' investments, and should also be examined within the overall framework. Institutional investors' divestment away from 'brown' projects and investment in green projects could affect their respective prices and raise related efficiency concerns. These effects need to be analyzed holistically: voluntary de-carbonization by some investors may have little or no effect if other investors step in. The overall framework also needs to include stranded assets, their effect on investor behavior, and the efficiency of green finance.

The impact of disaster risk sharing among financial market participants and its efficiency should also be part of the overall framework. Disaster risk sharing, such as the Government of Mexico \$315 million catastrophe bond and the African Risk Capacity Extreme Climate Facility, should be included in an overall framework to gauge the overall effectiveness and efficiency of green finance mobilization.

The overall framework could include the findings of the FSB Task Force on Climate-related Financial Disclosures. The task force aims to promote more effective climate-related disclosures, which is important for green finance analysis (even though green finance includes more than climate change). Enhanced disclosures on climate-related risks that are used by investors, creditors, and underwriters can improve asset market pricing and transparency and thereby reduce the potential of large, abrupt corrections in asset values that can destabilize financial markets. Better data will help investors and other stakeholders assess green projects and their impact on financial portfolios and markets. For example, using input output tables, increasingly available for different countries, could be helpful.

The impact of green finance on the insurance and reinsurance sectors, fossil-fuel and related firms, and other economic sectors should be evaluated. Insurance and fossil-fuel firms are particularly vulnerable to the divestments by investors, but other firms may also be affected by more investment in green projects. Risks to the insurance and reinsurance sectors include increased costs and frequency of climate-related natural disasters on both the liability and asset sides. Examples of the asset-size risk are those related to potential investments by insurance companies in sectors such as fossil-fuel. These risks required more quantification and analysis as part of an overall macroeconomic framework.

³ A 2013 study by researchers from University of North Carolina found lower default risks on green mortgages, which could support lower costs for this type of financing. However, more studies are needed.

Green finance could help allocate more capital to green projects and improve capital efficiency, based on local and global environmental priorities. Changes to global and national environmental policies should be regularly examined by the private sector to evaluate their impact on capital costs and investment portfolios, as well as by policymakers to assess their effectiveness in facilitating further investment in green technologies that could make economies more efficient by boosting productivity, employment and growth. (Some of the insights might also apply to other environmental problems such as local air pollution)

B. Effects on Growth and Employment

Green finance can facilitate the 'green transformation' of the global economy by ensuring environmental sustainability and long-term growth. Green finance could help facilitate policies to promote green investments, mitigate the impact of climate change, and positively affect economic growth, saving and investment levels, capital flows, and exchange rates by ensuring environmental sustainability. The channels, through which green finance can help the transformation to a green economy, alleviate and prevent environmental disasters, and ensure environmental sustainability and long term growth, need to be explored further.

Green finance can help shift employment to the green economy and increase overall employment. Investment in green technologies could help shift employment away from polluting and toward green industries. The overall effect on employment depends on the elasticity of substitution between labor and capital in different sectors. There are important challenges related to retraining, skill enhancement, and potential relocation. Policies may be needed to facilitate the shift to the green economy.

Green finance can help economies diversify and expand growth away from 'brown' into 'green' technologies. Green technologies can increase growth through innovations that would boost productivity, employment, and related demand. Moreover, green finance can be important for growth and employment in local economies in particular in cases of polluted cities that are cleaned and become more attractive to live and work, and thus become more conducive to attracting talent/innovation. The overall impact will partly depend on the ability of green technologies to obtain financing, which should be a focal point of this analysis.

Analytical work should focus on providing quantitative information on the impact of green finance on employment and growth. Policies and challenges to further develop green finance and the facilitation of growth and employment should be investigated. The costs of the counterfactual of not boosting green finance should also be considered.

II. Research Roadmap

The following is an indicative work plan for the above analysis:

- The impact on the cost of capital and capital allocation efficiency from private green finance mobilization, including collecting preliminary data and analysis on the impact on 'green' and 'brown' projects (by end-2016).

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- The impact on growth and employment, using existing models as well as new ones that incorporate green finance. The models will need to be calibrated to gauge green finance's impact on growth and employment (by mid-2017).