FIRMS’ ENVIRONMENTAL PERFORMANCE AND THE COVID-19 CRISIS

Chapter 5 at a Glance

- Tighter financial constraints and weaker economic conditions can act as a drag on firms’ environmental performance.
- The coronavirus disease (COVID-19) crisis could substantially reduce firms’ green investments, reversing gains in their environmental performance made in past years.
- Climate policies and green investment packages are therefore warranted to support a green recovery and the transition to a low-carbon economy.
- Policies aimed at fostering sustainable finance such as better disclosure standards and product standardization could further help mobilize green investments and alleviate firms’ financial constraints.

Introduction

The shutdown in economic activity as a result of the COVID-19 crisis resulted in a sharp decline in global carbon emissions (Figure 5.1, panel 1). Daily emissions in early April 2020 fell by about 17 percent compared with 2019 levels, though most of this decline has reversed since then as economic activity has picked up across countries. Such a reversal in emissions is in line with what turned out to be only a temporary decline in the price of carbon emission allowances in March 2020 (Figure 5.1, panel 2). Overall, recent studies forecast a temporary reduction in emissions of about 4 to 7 percent in 2020, far from the large and sustained decrease in emissions required under the Paris Agreement to limit the increase in global temperature to well below 2°C (Le Quéré and others 2020).

There is also a possibility that the transition to a low-carbon economy could be delayed should the economic scarring from the pandemic crisis run deep, inducing economic agents and policymakers to sideline or postpone environmental objectives. Heightened economic uncertainty, a sharp drop in energy prices, and corporate balance sheet vulnerabilities may result in a reduction in investments and research in long-horizon, capital-intensive green investments. Climate policies and green investment packages are therefore warranted to support a green recovery and the transition to a low-carbon economy.

Policies aimed at fostering sustainable finance such as better disclosure standards and product standardization could further help mobilize green investments and alleviate firms’ financial constraints.

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In the short term, there is an almost one-to-one relationship between economic growth and emissions (Hale and Leduc 2020).

The UN Environment Programme (2019) estimates that emissions need to decline by 2.7 percent annually in order to reach the 2°C goal by 2030.
projects. In addition, subsidies or economic rescue packages aimed at softening the impact of the crisis may slow the transition—for example, by supporting firms or activities not compatible with long-term climate mitigation goals.

At the same time, the current crisis could also present an opportunity to accelerate the transition to a low-carbon economy by inducing structural shifts in consumer and investor preferences toward environmentally friendly products in the event economic agents change their beliefs about the likelihood of other catastrophic events, such as those linked to climate change.\(^3\) In the corporate sector, for example, climate change has become an increasingly important topic since the onset of the pandemic, as is evident from firms’ earnings calls transcripts (see Box 5.1). More generally, an increased awareness of the benefits of long-term disaster prevention could facilitate implementation of green policy measures such as carbon taxes.\(^4\)

Against this backdrop, this chapter aims to address the following two key questions: (1) How has the COVID-19 crisis affected green financing so far? (2) What can be learned from past economic crises about the likely behavior of the corporate sector in the near and medium terms with respect to the greening of the economy?

**The COVID-19 Crisis and Financing the Energy Transition**

The COVID-19 crisis has not led to a sustained decline in green financing so far. Issuance of green corporate bonds, which has trended up over the past decade, declined in March 2020 in the midst of the financial market turmoil, but it has picked up since,

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\(^3\)Survey evidence suggests that voters have become more worried about other global threats, such as climate change, after experiencing the COVID-19 pandemic (Geman 2020).

\(^4\)Calls for implementing “green recovery” packages in the aftermath of the COVID-19 crisis have come from different quarters, including the private sector in some cases. For example, in June 2020 more than 100 global investors called for a green European Union recovery plan. The EU coronavirus recovery package earmarks about 37 percent of the funds for climate protection.
with the share of green bonds in total corporate bond issuance returning to 2019 levels (Figure 5.2, panel 1). In the syndicated loan market, loans to firms with an above-median score in environmental performance have increased over the past decade compared with loans to firms with a below-median score.5 Lending to both types of firms dropped slightly in the first quarter of 2020 (Figure 5.2, panel 2).

Investment funds with a focus on sustainable or environmental investments have continued to attract investors throughout the crisis, especially fixed-income funds, with only a small drop in aggregate inflows in May 2020 but remained positive.

Equity indices with a focus on environmental issues performed at least as well as the overall market.

Bank lending has shifted to green firms over the past decade.

5Firm-level environmental, social, and governance data come with several caveats. First, the data cover only publicly listed firms, so the results do not necessarily carry over to the entire economy, which includes unlisted small- and medium-sized enterprises. Second, there is a lack of standardization and transparency across data providers, so environmental scores from different providers may capture different features of environmental performance. Third, as some scores are self-reported by firms, accuracy may vary across the sample. See Online Annex 5.1 for a description of the variables used in this chapter. All annexes are available at www.imf.org/en/Publications/GFSR.

Sources: Bloomberg Finance L.P.; Dealogic; Morningstar; Refinitiv Datastream; and IMF staff calculations.

Note: Panel 1 shows global green corporate bond issues. Panel 3 shows quarterly flows into sustainable or environmental fixed-income or equity funds. MSCI ACWI = Morgan Stanley Capital International All Country World Index.
some asset classes (Figure 5.2, panel 3).6 A possible
driver of the good performance of sustainable and
environmental funds may have been the relatively high
returns that green investments have experienced during
this crisis in general (Figure 5.2, panel 4).

Overall, the impact of the COVID-19 crisis on the
financing of green investments so far seems to have
been modest and short-lived. However, given the severity
and possible persistence of the shock—in terms of
output decline, the extent of potential scarring, and
the heightened economic uncertainty—there could be
significant strains on corporate balance sheets. It is
therefore challenging to forecast whether such trends
will continue and ultimately what the overall impact of
the crisis will be on firms’ environmental performance
and on their ability to contribute to global climate
change mitigation efforts. In view of this concern, the
analysis in the next section examines firms’ environ-
mental performance during previous episodes of finan-
cial and economic stress to draw possible implications
for the current episode.

**Lessons from Past Economic Crises for Firms’
Environmental Performance during the
COVID-19 Crisis**

Existing research focusing on the United States
suggests that the environmental, social, and governance
(ESG) performance of financially constrained firms—
that is, firms that face difficulties in raising external
capital—is generally weaker relative to unconstrained
firms (Hong, Kubik, and Scheinkman 2012).7 Therefore,
a deterioration in financial or economic condi-
tions that results in a tightening of firms’ financial
constraints is likely to reduce their ability to invest in
green projects and cut greenhouse gas emissions.

Extending this analysis to a global sample and
specifically analyzing firms’ environmental performance
shows that tighter financial constraints are indeed
associated with worse environmental performance
(Figure 5.3, panel 1). Proxying firms’ financial con-
straints by firm size (logarithm of total assets), rating
status, interest coverage ratio, ability to pay dividends,
and the commonly used Kaplan-Zingales index, the
environmental performance of financially constrained
firms is in each case significantly weaker than that of
unconstrained firms. Specifically, environmental
performance falls by 10 points when firm size drops
from the median to the 25th percentile of the firm
size distribution. When a firm does not pay dividends
or when it is not rated, its environmental score is 4
points and 3 points lower, respectively, than the score
of dividend-paying and rated firms. The environmental
score is 1 point lower when an aggregate measure of
financial constraints (the Kaplan-Zingales index) is
above the median of the sample distribution. Similar
results are obtained when considering firms’ carbon
intensity instead of their environmental performance.

A key channel through which financial constraints
can affect firms’ environmental performance is a
decline in investments in green technologies. Con-
strained firms may postpone or reduce such invest-
ments if they do not directly contribute to revenue
generation. Moreover, financially constrained firms
may face difficulties in borrowing against future profits
to invest in research and development, consequently
postponing investments in intangibles that could
potentially improve their environmental performance.

Regression analyses support these hypotheses and
suggest that financially constrained firms are less likely
to make investments that reduce future environmental
risks, such as treatment of emissions or installation of
cleaner technologies (Figure 5.3, panel 2). For exam-
ple, the probability that a firm will make an environ-
mental investment falls by 6 percentage points when
firm size drops from the median to the 25th percentile
of the firm size distribution.

These results have important implications
in the current COVID-19 context. An adverse
macro-financial shock that increases uncertainty and
amplifies firms’ financial constraints is likely to affect
firms’ environmental performance and has the poten-
tial to significantly impede their ability to invest in

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6 Sustainable funds explicitly indicate all kinds of sustai-
nability; impact; and environmental, social, and governance (ESG)
strategies in their prospectus. Environmental funds invest in
environmentally oriented industries. See the October 2019 Global
Financial Stability Report for a discussion of sustainable finance
and financial stability.

7 Because financial constraints are not directly observable, different
proxies are used in the literature (see Online Annex 5.2): firm size
(large firms are expected to be less financially constrained than
small firms), rating status (firms with a rating may have easier access
to capital markets than those without), the interest coverage ratio
(defined as earnings before interest and taxes divided by interest
expenses, reflecting a firm’s debt repayment capacity with higher
values indicating less financially constrained firms), the ability to pay
dividends, and the Kaplan-Zingales index (an aggregate measure of
financial constraints).
green projects. To quantify the extent of the impact, two types of shocks are analyzed here: (1) a global financial stress shock (proxied by the Chicago Board Options Exchange Volatility Index \[VIX\]) and (2) a real economic activity shock capturing a sudden drop in domestic output.\(^8\)

\(^8\)See Online Annex 5.3.

The analysis shows that a sudden jump in the VIX, comparable to the average level that prevailed in the first half of 2020 during the COVID-19 pandemic, would lead to a persistent drop in firms’ environmental performance by up to 5 points, with the pre-shock performance level not attained for at least three years after the shock (Figure 5.3, panel 3). Absent policy actions and behavioral changes, this would imply that...
average corporate environmental performance would return to the levels that were last observed in 2006. Moreover, the adverse effect of global financial shocks on environmental performance is magnified when firms are financially constrained (Figure 5.3, panel 4). For example, for firms with an interest coverage ratio below 1 or for unrated firms in 2019, the global financial stress shock observed thus far in 2020 is estimated to lower environmental performance by 2 additional points, compared to firms with an interest coverage ratio above 1 or rated firms.9

A large decline in the output gap (10 percentage points, about 50 percent larger than that observed in the Group of Seven [G7] economies during the global financial crisis), would lead to a 3 point decline in firms’ environmental performance in the medium term (Figure 5.4, panel 1).10 Similarly, firms’ carbon intensity—captured by their total carbon emissions relative to revenue—could increase by up to 8.5 percent in the medium term after such a decline in the output gap (Figure 5.4, panel 2), even though the initial response of carbon intensity to economic shocks may be small because of the cyclical dynamics of carbon dioxide emissions observed during recessions (Figure 5.1, panel 1; Hale and Leduc 2020).

In addition to direct global financial and economic shocks, changes in oil prices could also impact corporate environmental performance by affecting ... and carbon intensity deteriorates following contractionary economic shocks. Further, carbon intensity may increase by up to 8.5 percent in the medium term after such a decline in the output gap (Figure 5.4, panel 2), even though the initial response of carbon intensity to economic shocks may be small because of the cyclical dynamics of carbon dioxide emissions observed during recessions (Figure 5.1, panel 1; Hale and Leduc 2020).

10Other more global measures of economic activity shocks such as the forecast error for the current-year global GDP growth relative to the World Economic Outlook projection, or the global economic activity shock from Baumeister and Hamilton (2019) also lead to a fall in corporate environmental performance in the medium term.

9These economic effects are calculated by multiplying the interaction term by a 16.3 point increase in the VIX (corresponding to the difference in the average value of the VIX in 2020, using data up to July 31, 2020, relative to the average value in 2019).
firms’ incentives and their financial constraints. The onset of the COVID-19 crisis was accompanied by a steep decline in the international price of oil. The effect of such a decline in oil prices on firms’ environmental performance is, however, ambiguous. On the one hand, it may relax firms’ financial constraints and reduce the incentives for businesses to improve their energy efficiency and shift away from fossil fuels, including by hindering the development of clean energy sources by making investments in new projects less profitable. On the other hand, low oil prices could benefit the energy transition by hurting the profitability of the oil sector and leading to lower investments in the fossil fuel sector and a decline in production, thereby making it easier for clean energy firms to compete.

In principle, the effect of an oil price shock on environmental performance is likely to depend on the underlying source of the shock—that is, whether it is a demand- or supply-driven shock. A negative global demand shock associated with a decline in economic activity that reduces the demand for oil could be associated with lower corporate environmental performance as investments into cleaner energy sources are delayed because of already tight financial conditions for firms. Conversely, a drop in oil prices due to an oil supply shock could trigger an increase in global economic activity (Baumeister and Hamilton 2019), easing firms’ financial constraints and allowing them to improve their environmental performance.

Econometric analysis suggests that the source of the oil price fluctuation is indeed key to understanding firms’ environmental response to a shock. Historically, when oil prices have fallen due to demand-side factors, environmental corporate performance has been weaker. By contrast, when oil prices have declined due to an oil supply shock, environmental performance of firms has improved (Figure 5.5). To the extent that the COVID-19-induced oil price shock is largely a demand-driven shock, firms’ environmental performance is thus likely to suffer. Overall, these results indicate that tighter financial constraints are associated with weaker corporate environmental performance. Adverse global financial and output shocks that increase uncertainty and amplify firms’ financial constraints weigh significantly on their environmental performance. Furthermore, a reduction in oil prices against the backdrop of a decline in global economic activity is unlikely in itself to lift corporate environmental performance. Thus, absent strong supportive policy actions, tighter financial constraints and weaker economic activity related to the COVID-19 crisis are likely to act as a drag on firms’ environmental performance in the future.

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11Global energy demand declined by 3.8 percent in the first quarter of 2020. The demand for oil, coal, and to a lesser extent gas and nuclear energy is projected to decline substantially by the end of 2020 (IEA 2020).

12Acemoglu and others (2019) discuss the long-term effects of the shale gas boom, which reduces carbon dioxide emissions from coal in the short term, while increasing aggregate production and directing energy innovation to shift away from clean energy to fossil fuels.

13Difficulties to reach an agreement among the OPEC+ coalition also contributed to the collapse in oil prices in early 2020, but a decomposition of the oil price shock in March and April 2020 suggests that it was largely driven by demand-side factors. See Online Annex 5.3.
Conclusions and Policy Recommendations

The COVID-19 crisis has resulted in a temporary decline in global carbon emissions, but its long-term impact is uncertain. On the one hand, the crisis may increase awareness of catastrophic risks and bring about a major shift in consumer preferences, corporate actions, and investor behavior. On the other hand, the historical evidence presented in this chapter suggests that there is a real possibility that, barring public interventions, investment by firms to improve their environmental performance may decline in this time of macro-financial stress.

To achieve the reduction in emissions needed to keep global warming below 2°C, an increase in green investments, in combination with steadily rising carbon prices, is critical (October 2020 World Economic Outlook; October 2019 Fiscal Monitor). Public policies and green recovery packages are important to offset the potential deterioration in firms’ environmental performance resulting from the crisis (see the October 2020 Fiscal Monitor).

In addition, to alleviate firms’ financial constraints and to aid green investment, it will be key to put in place policies that support the sustainable finance sector, such as better disclosure standards, development of green taxonomies, and product standardization (see the October 2019 Global Financial Stability Report).
Box 5.1. Climate Index Based on Firms’ Earnings Calls

To measure how firms’ exposure to and awareness of climate change have evolved over time, a firm-level climate index was constructed for this chapter based on quarterly earnings call transcripts using a climate change dictionary built from four climate change glossaries.1 To construct the index, earnings call transcripts from 4,109 firms located in 46 countries are used.

Panel 1 of Figure 5.1.1 shows the share of earnings call transcripts that mention specific phrases related to climate change, such as “climate change,” “CO₂,” or “emissions.” A sharp increase in discussions involving climate change topics is observed in 2020, coinciding with the COVID-19 pandemic. This could, for example, be the result of the COVID-19 crisis increasing firms’ focus on catastrophic events and long-term risks.

The climate change discussion index is then constructed for each firm by assigning a value of 1 to each earnings call transcripts that contains a phrase included in the dictionary. Panel 2 shows the average of the index over time. It is noteworthy that in the earnings calls of energy sector firms, mentions of climate-change-related terms spiked after the Paris Agreement in 2016, highlighting the importance of policy risk for this sector. The increase in discussions involving climate change over the past few years is consistent across countries (Online Annex 5.4).

Figure 5.1.1. Climate Index

Climate change discussions have increased during the COVID-19 crisis.

1. Annual Share of Earnings Call Transcripts Containing Specific Climate-Change-Risk-Related Terms (Percent)

2. Quarterly Share of Firms with Climate Discussions, All Sectors and Energy Sector (Percent)

After the Paris Agreement, firms in sectors exposed to transition risk became more aware of climate risks—or opportunities.

Sources: FactSet; and IMF staff calculations.
References


