

Financing a Sustainable Recovery

This special section discusses the importance of developing green and social finance in ensuring a sustainable recovery from the global recession triggered by the outbreak of coronavirus disease (COVID-19). A global economy that is more resilient to shocks will help people around the world to live a better life.

Before the outbreak of COVID-19, emerging Asian economies were progressing in their pursuit of the United Nations Sustainable Development Goals through various policies. Climate change, which poses a long-term challenge to sustainable development, has hit the poor especially hard and could potentially push more than 100 million people back into poverty by 2030. There is now plenty of evidence showing that negative environmental and social externalities have significant negative impacts on economic development. **Box 5** reviews extant knowledge on how various environmental and social challenges can hamper economic growth.

The pandemic has sharply curtailed global economic growth and worsened social conditions worldwide. Furthermore, COVID-19 poses a disproportionately larger threat to poor and vulnerable groups such as low-income households and small and medium-sized enterprises. In many economies, the process of sustainable development has been disrupted by falling fiscal revenues and increased expenditures to contain COVID-19 and mitigate its negative economic impacts. Nevertheless, global policy makers are aware that pursuing a sustainable development path is important to prevent future shocks. With limited policy scope, mobilizing private financial resources for green and inclusive investments becomes vital to achieving a sustainable recovery.

The importance of environmental and social externalities is now widely acknowledged in financial markets. Amid the market turmoil caused by COVID-19 during the first quarter of 2020, environmental- and social-themed financing instruments showed resilience and even outperformed conventional funds. As a result, more attention is being paid to financing that integrates social impacts such as social bonds, sustainable bonds, sustainable loans, and sustainability-linked bonds. **Box 6** reviews the development of green and social finance during the COVID-19 pandemic.

While conventional wisdom may have once suggested that investors only care about financial returns and therefore do not consider environmental and social externalities, this is no longer the case. **Box 7** reviews existing knowledge and outlines a few reasons why externalities matter, including lower systematic and idiosyncratic risks, client demands and fund flow concerns, hedging for climate-related risks, and social pressure.

In addition to investors, existing evidence shows that sustainable finance also benefits other stakeholders by delivering economic benefits in terms of rising shareholder value, lower funding costs, a broader investor base, innovation, and increased growth and employment. **Box 8** summarizes the findings in the literature and details the positive economic impacts of green and social finance.

Box 5: Environmental and Social Externalities and Economic Growth and Development

Rapid population growth and economic development is upsetting the world's ecological balance.^a Environmental degradation is evident in air, water, land, and noise pollution, as well as in the loss of natural habitat. Environmental deterioration has given rise to reproductive, mental health, and other public health problems. The 1997 Kyoto Protocol, which was succeeded by the Paris Agreement in 2016, required countries to make concrete commitments in the fight against global climate change. The agreements reflect a growing recognition that the international community must mitigate the disastrous effects of climate change and environmental destruction, including natural hazards and occurrences of infectious diseases, to achieve the United Nations (UN) Sustainable Development Goals (SDGs).

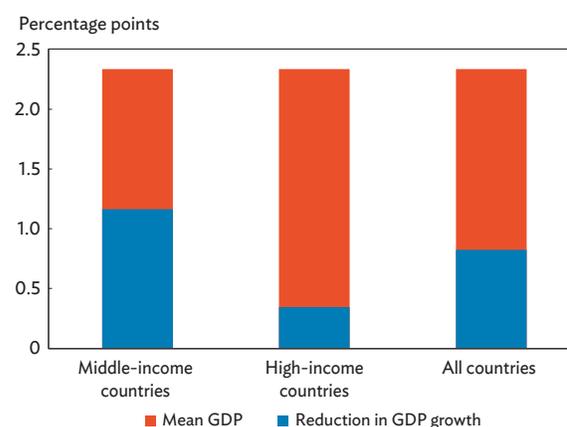
Rapid environmental pollution has been linked to climate change. It also directly affects health, as evident in rising morbidity and mortality rates. Many studies find evidence that air pollution leads to a deterioration of productivity and growth. Air pollution is a silent killer since the poisonous pollutants are invisible to the human eye. While most studies document outdoor air quality, the World Bank (2019) has also found that many people die from poor indoor air quality, especially in developing economies, where households are exposed to dirty fuels. A study of the People's Republic of China (PRC), the world's most populous country and a manufacturing powerhouse, show that a decline in air pollutants can translate into higher labor productivity. Fu, Viard, and Zhang (2017) estimate that reducing PM2.5 (sulfur dioxide) by 1% through methods other than lowering manufacturing output would generate annual productivity gains of CNY57,600 (110.5) for the average firm and CNY9.2 billion (17.6), or 0.06% (0.12%) of the PRC's gross domestic product (GDP), across all firms.^b

The effect of pollutants is not unidirectional. Ho, Oueghlissi, and el Ferktaji (2019) find that there is bidirectional causality between GDP and carbon dioxide emissions. This implies that either a virtuous or a vicious cycle can ensue between a country's environmental state and its economic growth. The negative externalities from polluted cities harm neighboring cities, where nearby cities that stand in the way of wind from a polluted city show increased pollution. In addition, air pollution can induce an exodus of highly skilled workers from urban areas who want to avoid such pollution, as the harmful effects of air pollution impair the productivity of the workforce

and its quality of life (Fu, Viard, and Zhang 2017). Air pollution also harms mental health. As the average concentration of particulate matter increases, the probability that the exposed population will experience a deterioration of mental health also rises. Chen, Oliva, and Zhang (2018) estimated that, in the PRC, the annual increase in health expenditures resulting from air pollution totaled USD22.88 billion in 2014–2015.

Water pollution, which is known to affect ecosystems, agriculture, and health, is an important driver of economic growth. According to Damania et al. (2019), when the biological oxygen demand, an indicator of water pollution, exceeds 8 milligrams per liter then the annual GDP growth of downstream regions is reduced by 0.83 percentage points relative to a mean growth rate of 2.33% used in the study (Figure B5). Access to water is important since shortages limit economic growth and job creation. The UN (2016) has estimated that about 50% of the world's workers are employed in eight key water-based and natural-resource-dependent industries. An improved water supply in Africa, for example, could generate an estimated economic return of about USD28.4 billion a year, or nearly 5% of the continent's GDP. There is also evidence that water quality exceeds the effect of water quantity on growth. El Khanji and Hudson (2016), using a panel of 177 economies covering the period

Figure B5: Water Pollution and Gross Domestic Product Growth



GDP = gross domestic product
 Note: Annual mean GDP growth is 2.33%.
 Source: Damania et al. 2019. *Quality Unknown: The Invisible Water Crisis*. Washington, DC: World Bank.

^a This box was written by Cynthia Castillejos-Petalcorin (Senior Economics Officer) and Donghyun Park (Principal Economist) in the Economic Research and Regional Cooperation Department of the Asian Development Bank.

^b PM 2.5 is particulate matter (PM) that have a diameter of less than 2.5 micrometers that can be inhaled and cause serious health problems.

Box 5: Environmental and Social Externalities and Economic Growth and Development

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1960–2009, found out that the quality of water affected economic growth in both the short and long run to a greater degree than water quantity. Thus, the study suggests that improving water quality will also strengthen economic growth.

Social development can contribute to sustainable economic growth. Investment in areas such as education, sanitation, health care, gender equality, and affordable housing fosters social development, which in turn fosters economic development. An especially important contribution of social investment is that it promotes the type of inclusive growth that enables vulnerable groups to take part in and benefit from development.

Small and medium-sized enterprises (SMEs) comprise a vulnerable group that plays a vital role in economic development. In particular, SMEs are an engine of job creation and a catalyst for mobilizing local resources for rural development. The World Bank (2020) has estimated that formal SMEs contribute up to 40% of GDP in many emerging economies. SMEs also contribute to the achievement of the UN Sustainable Development Goals via income distribution and poverty alleviation. In Asia and the Pacific, SMEs have also greatly contributed to the growth of exports (Jabbour et al. 2020).

Another vulnerable group is women. Reducing gender inequality benefits social development and inclusive growth. Based on indicators of education performance in science, technology, engineering and mathematics, labor market activity, wages, and work-life balance, the European Institute for Gender Equality (2017) found that measures to improve gender equality would add about 10.5 million jobs and lift per capita GDP by 4%–10% in the European Union by 2050. In Asia and the Pacific, reducing barriers to female participation in the labor force would mitigate the negative economic impact of population aging on the region's economic growth (Asian Development Bank 2011). However, Kabeer and Natali (2013) found that while promoting gender equality fosters growth, there is no guarantee that economic growth will foster gender equality on its own in the absence of supportive measures such as promoting female education. Girls and women often suffer from unequal access to education, health care, finance, and technology, especially in developing economies.

Many economies have yet to tap the full potential of female participation in the workforce. A vast literature on gender inequality shows that female labor participation contributes tangibly to social development and inclusive growth. The

United Nations Children's Fund (UNICEF) (2019) reported that 132 million school-aged girls are currently not in school, and about 14.95 million girls are married off as child brides. The economic cost of child marriage may be as high as USD1.7 billion in Niger relative to delaying the girls' marriage age to 20 (World Economic Forum 2018, World Bank 2019). Using industry-level data for a group of developing economies in the 1990s, Bertay, Dordevic, and Sever (2020) found that allocating female labor to more productive uses significantly boosts economic growth. As such, increased female labor participation is imperative and should be given high priority in the public policy agenda.

Poor sanitation and lack of access to affordable housing are social problems that reduce human well-being and social and economic development (World Health Organization [WHO] 2019). A large number of economy-level studies confirm that the failure to address these issues heightens the risk of health problems and lowers productivity. UNICEF and WHO (2017) report that while 2.1 billion people gained access to basic sanitation services between 2000 and 2017, 2.0 billion people still lack such access. A cost-benefit analysis by WHO in 2012 found that USD1.0 invested in sanitation generates an average economic return of USD5.5 in terms of lower health costs, higher productivity, and fewer premature deaths. Within Asia, the returns are USD8.8 in East Asia and USD5.0 in Southeast Asia.

Based on UN data, only 13 of the world's cities have adequate affordable housing (UN HABITAT 2016). Affordable housing policies not only promote social stability but also provide economic opportunities. For instance, many SMEs are home-based enterprises that provide work, income, and services for many people (Tipple 2005). In addition, affordable housing enables the clustering of younger people who are indispensable for the knowledge economy (Florida 2019).

The coronavirus disease (COVID-19) is a multidimensional global public health crisis (Manisalidis et al. 2020). The pandemic's lingering effects on physical and mental health will be more numerous and varied than what medical experts initially expected (Mayo Clinic 2020, Couzin-Frankel 2020). While a healthy and productive workforce is an important ingredient of sustainable and inclusive economic growth (UN 2019), COVID-19's persistent effects will impact the productivity of the workforce in many economies.

Encouragingly, many economies have begun to adopt sustainable and socially responsible practices. Economy-level evidence points to a significant and positive impact

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Box 5: Environmental and Social Externalities and Economic Growth and Development

continued

of improved environment, social, and governance (ESG) policies on economic growth (Wang, Yu, and Zhong 2020). The effect is larger in countries with stronger ESG incentives, more robust corporate and social responsibility, and effective law enforcement systems (Wang, Yu, and Zhong 2020). In a similar vein, governments with a better ESG performance can improve market risk perception and thus benefit from lower government bond spreads and financing costs (Crifo, Diaye, and Oueghlissi 2017). Granular firm-level studies show that stronger ESG policies in the corporate sector have a significant and positive effect on national-level economic performance. In a study of 30 economies at different income levels, Zhou et al. (2020) show that a 1-percentage-point increase in average economic, social, and governance performance leads to gains of 0.06%, 0.09%, and 0.16%, respectively, in the log of GDP per capita. The results hold for both developed economies with more systematic ESG policies and, more interestingly, for developing economies too. This suggests that a proactive adoption of stronger ESG policies can contribute to growth (Tarmuji, Maelah, and Tarmuji 2016).

A fresh perspective that recognizes and strengthens the nexus between environmental and social factors on one hand, and economic growth on the other, is the blueprint for sustainable development in the future. With appropriate and conducive policies that protect the environment and address various social needs, governments can become catalysts of sustainable development.

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Box 6: Development in Green and Social Finance during COVID-19 Period in Developing Asia

According to the United Nations Economic and Social Commission for Asia and the Pacific, developing Asia needs to invest USD1.5 trillion annually to achieve the United Nations (UN) Sustainable Development Goals by 2030.^a The Asian Development Bank's climate-adjusted annual investment requirement over the same period is USD200 billion.^b Public sector resources alone are insufficient to finance such huge investments. This means that the region must leverage and mobilize resources from the private sector to finance investments promoting green and inclusive economic growth that reduces poverty, benefits vulnerable groups, and decreases inequality.

Extant environment, social, and governance (ESG) debt instruments can be broadly classified into two major categories: bonds and loans. Widely used bond instruments include green bonds, social bonds, sustainability bonds, and sustainability-linked bonds. These are fixed-income products designed to fund investments that generate positive environmental and social outcomes. On the other hand, ESG-themed loans such as green loans and sustainability-linked loans (SLLs) are bank products that finance or refinance, in whole or in part, new and/or existing eligible

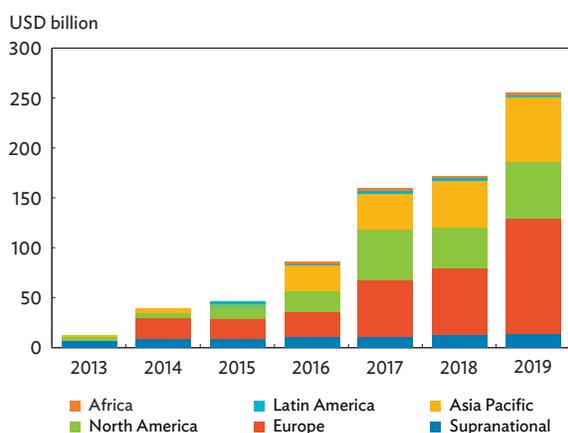
projects with clear benefits to the environment and social sustainability.

Before the outbreak of the coronavirus disease (COVID-19), green and social financing was clearly on the rise, making it one of the most promising areas in development finance.^c Green bonds were the forerunner of ESG bonds. The total global value of green bonds grew from USD1.5 billion to USD257.5 billion between 2007 and 2019. Green bonds comprised the largest category of ESG bond issuances in 2019, accounting for more than half (56%) of issuance in the sustainable debt market. **Figure B6.1** shows the growth of global green bonds, which have gained traction in Asia and the Pacific, with the region now accounting for 12% of global green bonds. According to Climate Bonds Initiative (CBI) data, the issuance of green bonds in Asia and the Pacific reached USD33.1 billion in 2019. In Southeast Asia, which accounts for about 25% of the regional total, issuance nearly doubled to USD8.1 billion in 2019 from USD4.1 billion in 2018.

Amid the COVID-19 pandemic, a slowdown in the green bond market's expansion has been observed and attributed to investors' shifting appetite toward social and sustainability

Figure B6.1: Green Bond Issuance

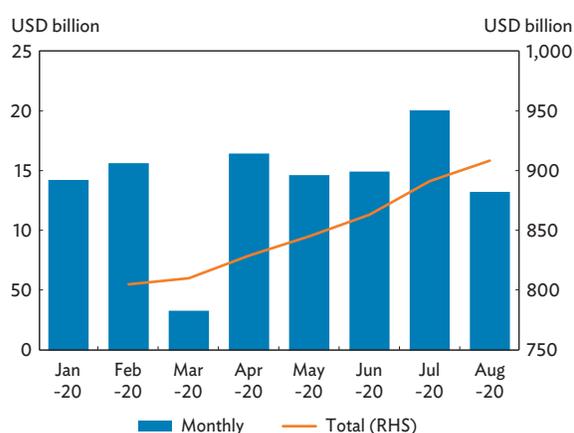
Figure B6.1a



RHS = right-hand side, USD = United States dollar.

Sources: Authors' compilations based on data from Climate Bonds Initiative monthly market blogs and HSBC.

Figure B6.1b



^a This box was written by Cynthia Castillejos-Petalcorin (Senior Economics Officer) and Donghyun Park (Principal Economist) in the Economic Research and Regional Cooperation Department of the Asian Development Bank (ADB).

^b ADB. 2017. *Meeting Asia's Infrastructure Needs*. <https://www.adb.org/publications/asia-infrastructure-needs>. Manila.

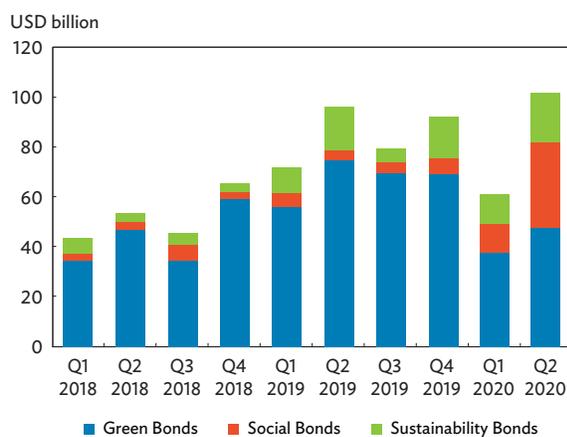
^c S. Hyun, D. Park, and S. Tian. 2020. The Price of Going Green: The Role of Greenness in Green Bond Markets. *Account Finance*. 60 (1), pp. 73–95; O. D. Zerbib. 2019. The Effect of Pro-Environmental Preferences on Bond Prices: Evidence from Green Bonds. *Journal of Banking & Finance*. 98 (2019), pp. 39–60.

Box 6: Development in Green and Social Finance during COVID-19 Period in Developing Asia *continued*

bonds that address public health and economic inequalities. During the first half of 2020, global green bond issuance stood at USD91.8 billion, down about 22% from the same period in 2019. In Asia and the Pacific, the CBI noted that issuance in the second quarter (Q2) fell to its lowest level since the first quarter (Q1) of 2017, with January–June 2020 green bond issuance amounting to only USD10.7 billion. Despite the market downturn in 2020, green bonds have still held up better than investment-grade corporate credit.^d

Even as green bond issuance slows, the COVID-19 pandemic has heightened the need to support vulnerable groups and improve public health and sanitization, underscoring the urgent need for social and sustainability financing. There has been significant growth in social and sustainability bond issuance as sovereigns and corporates tap the debt market. Social bond issuance rose from a mere USD277 million in 2014 to USD20.0 billion in 2019, according to the CBI. In the first half of 2020, social bond issuance reached USD10.9 billion in Q1 2020 and then tripled to USD33.0 billion in Q2 2020. The relative importance of social bonds in ESG investing has clearly increased substantially in 2020 (Figure B6.2).

Figure B6.2: ESG Bond Issuance



ESG = environment, social, and governance; Q1 = first quarter; Q2 = second quarter; Q3 = third quarter; Q4 = fourth quarter; USD = United States dollar. Sources: Climate Bonds Initiative, Dealogic, and Moody's Investors Service.

Refinitiv estimates that the volume of sustainable bond issuance in January–June 2020 totaled USD194.5 billion, a 47% year-on-year increase from the same period in 2019. Issuance volume totaled USD63.6 billion in Q1 2020 before more than doubling to USD130.9 billion in Q2 2020. Consequently, Asia and the Pacific (including Japan) now accounts for 16% of the global sustainability bond market. Within the region, large social bond issuances, from both sovereigns and corporates, came from the Republic of Korea (USD9.5 billion), Japan (USD9.3 billion), the People's Republic of China (USD0.9 billion), India (USD0.5 billion), and the Philippines (USD0.4 billion).^e A common use of the proceeds has been to extend loans to financially strapped small businesses and to finance development of coronavirus vaccines.

The issuance of sustainability bonds, whose proceeds are used for green and social projects, stood at USD46.0 billion in full-year 2019. With increased attention from investors, sustainability bond issuance volume exploded to USD56.7 billion during the first half of 2020, more than twice the amount issued in the first half of 2019. The number of issuances soared by 94% from the previous year, according to Refinitiv. Some of the largest issuances of sustainability bonds in Asia and the Pacific to date in 2020 include (i) Japan's Mitsubishi UFJ Financial Group issuance in September worth JPY150 billion (USD1.42 billion); (ii) the Government of Thailand's dual-tranche USD966 million bond issuance in September, the first of its kind among members of the Association of Southeast Asian Nations, which was three times oversubscribed; and (iii) a triple-tranche offer of USD-denominated bonds by the Government of Indonesia in June worth USD4.3 billion, including a USD1 billion bond with a 50-year tenor, a first in Indonesian history.^f A *sukuk* (Islamic bond) variant of ESG-themed bonds was also issued by Indonesia in June 2020, raising another USD2.5 billion from a triple-tranche global *sukuk* that was 6.7 times oversubscribed.^g The common theme of the aforementioned issuances is the financing of activities to help cope with the impact of the pandemic.

Interestingly, investors remain keen on pandemic-related bonds despite the risk associated with weaker global

^d C. Bray. 2020. Green Bonds Gain Popularity, A Defensive Bet as Coronavirus Pandemic Weighs on Markets, Investment Managers Say. *SCMP*. 4 May. <https://www.scmp.com/business/banking-finance/article/3082693/green-bonds-gain-popularity-defensive-bet-coronavirus>.

^e U. Volz. 2020. An Urgent Need for Social Bonds in Asia. *Background Paper for the Asian Development Outlook 2021*. Manila.

^f A. W. Akhla. 2020. Government Raises \$2.5b through Global Sukuk Offering to Address Pandemic Deficit. *Jakarta Post*. 18 June. <https://www.thejakartapost.com/news/2020/06/18/govt-raises-2-5b-through-global-sukuk-offering-to-address-pandemic-deficit.html>.

^g Footnote f.

Box 6: Development in Green and Social Finance during COVID-19 Period in Developing Asia *continued*

economic prospects. The interest perhaps reflects a growing awareness of sustainability in investment strategies and business practices. Moody's Investors Service revised its forecast for social and sustainability bond volumes to USD150 billion in 2020, up from its previous forecast of USD100 billion.^h

Similar trends have been observed for green and social-themed loans. The demand for SLL products picked up in 2019, peaking in the fourth quarter, as this modality facilitates the entry of companies into sustainable financing. SLL lending volume jumped 89% from USD188.3 billion in 2018 to USD122 billion in 2019.ⁱ However, in the first half of 2020, sustainable lending fell to USD79.1 billion, slightly declining from the same period in 2019. During Q2 2020, a total of USD31.9 billion of SLL products was issued (Figure B6.3).

Notwithstanding the strong demand for ESG blended bonds and loans, there are some concerns, especially as they relate to the lack of ESG ratings standardization. This should not impact the issuance of much-needed ESG financing, but rather could be a catalyst in fast-tracking efforts to harmonize and strengthen ESG ratings information. ESG financing is helping economies, in developing Asia and elsewhere, recover from the health and economic effects of the COVID-19 pandemic in an environmentally and socially sustainable way by influencing business conduct.

Finally, central banks can play a major role in supporting the development of green finance models and tools. They

Figure B6.3: Sustainable Loans



Q1 = first quarter; Q2 = second quarter; Q3 = third quarter; Q4 = fourth quarter; USD = United States dollar.
Sources: Climate Bonds Initiative, Dealogic, and Moody's Investors Service.

can also enforce policies on climate-related financial disclosure reporting. The UN has proposed a list of central bank interventions for financing development needs during the COVID-19 recovery period and beyond. These include extensions of swap lines and specific measures in monetary and financial policy frameworks that could integrate risks—including those related to sustainability, climate and environment, gender, and inequality—in financial supervision and regulation.^j

^h M. Segal. 2020. Moody's Raises Forecast for Global Sustainable Bond Issuance After Q2 Rebound. *ESG Today*, 17 August. <https://esgtoday.com/moodys-raises-forecast-for-global-sustainable-bond-issuance-after-q2-rebound/>.

ⁱ Refinitiv. H1 2020 Sustainable Finance Review. <https://www.refinitiv.com/perspectives/market-insights/refinitiv-analyzes-the-sustainable-finance-market/>.

^j UN. 2020. *Financing for Development in the Era of COVID-19 and Beyond (Part 1)*. https://www.un.org/sites/un2.un.org/files/financing_for_development_covid19_part_i_hosg.pdf.

Box 7: Why Environmental and Social Externalities Matter for Financial Markets

Green and social finance refers to investments that integrate environmental and social (E&S) impacts. It has become one of the fastest growing areas in development finance in recent years.^a Green and social finance helps address E&S issues such as food security, renewable and clean energy, affordable and accessible housing, healthcare, quality jobs, environmental protection, and education, among others (Camilleri 2020). By allocating capital to socially responsible and environmentally sustainable projects, and pricing the risks of negative externalities, green and social finance can guide investments toward generating positive externalities for the natural environment and vulnerable groups.

The literature has discussed the different motivations of investors to avoid negative green and social externalities. First, E&S practice serves as insurance against systematic risk in the economy. Lins, Servaes, and Tamayo (2017) suggested that (i) corporates can build social capital via practicing social responsibility, and (ii) a high level of social capital strengthens the perception of trustworthiness and thus boosts trust among stakeholders. Lins, Servaes, and Tamayo (2017) found that social capital pays off during a crisis when overall confidence is low and the value of trust increases. Specifically, they document that, during a crisis, firms with a higher level of social responsibility show superior performance than their peers in terms of profitability, productivity, and fund-raising ability, as they are supported by stakeholders' commitment to help such as through credit lines and sales. Hence, investments with positive E&S externalities offer insurance benefits against systematic risk such as a financial crisis or a pandemic. Similarly, Albuquerque, Koskinen, and Zhang (2019) developed a model showing that firms with social responsibility policies have lower profit elasticity in response to aggregate shocks, resulting in less systematic risk and higher firm valuations. They document supportive empirical evidence for this prediction.

Second, E&S compliance helps hedge against negative corporate events and the idiosyncratic risks of firms. E&S practices serve as reputation capital that help cushion against shocks or future E&S negative incidents. Godfrey, Merrill, and Hansen (2009) found that businesses' voluntary actions to improve social conditions create moral capital that provides insurance-like benefits and gains positive attribution from stakeholders. Facing negative corporate

events, this buffering of goodwill from stakeholders will reduce negative judgement and sanctions, and reduce the loss of shareholder value. Empirical evidence shows that compared to firms following an E&S initiative, firms that do not have an E&S practice will face huge costs—which reduces capital expenditure and eventually affects their core business in the context of negative E&S incidents (Ho, Nguyen, and Vu 2020)—and experience greater reductions in firm value because of reputational damage (Aouadi and Marsat 2018). When corporates are involved in E&S scandals, investors face risk. Chen, Dong, and Lin (2020) have indicated that institutional investors can lower portfolio risk more by controlling negative externalities than by boosting positive externalities.

Third, E&S investment can be motivated by preferences and signaling for sustainability and social responsibility by various stakeholders such as managers, shareholders, clients, and society at large. Riedl and Smeets (2017) showed that both intrinsic social preference (without self-benefit) and social signaling (with self-benefit such as social image and reputation) of investors play important roles in investing in E&S assets, and investors forgo financial returns via sustainable and responsible mutual funds by bearing higher management fees and lower returns. Similarly, Białkowski and Starks (2016) found that flows into sustainable and responsible mutual funds show greater persistence than flows into conventional funds, as they are also driven by clients' nonfinancial considerations. Similarly, Ghoul and Karoui (2017) documented that fund flows are less sensitive to the performance of mutual funds that hold more assets with high social responsibility levels, which is driven by clients' nonfinancial utility. Social norms and pressures also motivate E&S investment. Dyck et al. (2019) showed that institutional investment has a causal impact on holding companies' E&S performance. This impact is more pronounced for investors committed to E&S activism and for foreign investors from countries with strong social norms.

Fourth, investing in E&S-themed assets can help manage portfolio risks during a transition to low-carbon investments. The Task Force on Climate-Related Financial Disclosures (2017) outlined key climate-related risks (transition risk and physical risk) and opportunities during a low-carbon transition that have financial implications for companies.^b

^a This box was written by Shu Tian (Economist) and Mai Lin Villaruel (Economics Officer) in the Economic Research and Regional Cooperation Department of the Asian Development Bank.

^b Transition risk includes policy and legal risks due to changes in regulations and litigation, technology risk due to creative destruction in green technology, market risk due to climate-related changes in market supply and demand, and reputation risk due to stakeholders' changing perceptions toward green development. Physical risk includes acute risk from disasters and chronic risk driven by climate change patterns. Opportunities include resource efficiency and energy sources to save costs, products and services with low-emission features, markets with new opportunities, and resilience to better respond to climate-related risks.

Box 7: Why Environmental and Social Externalities Matter for Financial Markets *continued*

Dafermos, Nikolaidi, and Galanis (2018) found that climate change will harm both the financial and nonfinancial sectors by weakening the economic fundamentals of firms, thereby leading to financial instability. Dikau and Volz (2020) indicated that climate-related risks challenge monetary and financial stability, which has led central banks to consider incorporating climate-related risks into their macroprudential policy framework to safeguard macro-financial stability. For example, climate change may adversely affect price stability by influencing food and energy prices, which indirectly affects core inflation (Volz 2017).

In recent years, climate- and social-related risks have attracted attention that may challenge financial stability and thus invite new macroprudential policies. The Bank for International Settlements (2019) has indicated that climate change risk may pose a new type of systematic risk to financial stability.

The outbreak of the coronavirus disease (COVID-19) has underscored the role of financial stability amid shocks when businesses, especially small and medium-sized enterprises, have difficulty repaying their liabilities (Asian Development Bank 2020). As risks associated with climate change and social inclusiveness have gained regulatory and central bank attention in terms of the need to improve macroprudential practices, investments with E&S impacts can help boost portfolio resilience and strengthen the financial sector regulatory framework.

Such risks already show a real impact on financing costs and investment portfolios. In financial markets, investors have different incentives with regard to E&S externalities. Investors influence business investments via different mechanisms, such as ownership and monitoring efforts (Chen, Dong, and Lin 2020) and by conveying a preference for improved E&S performance (Dyck et al. 2019). Ethical investors such as green investors are also essential in risk-sharing in financial markets and thus can affect the cost of capital among polluting firms shifting to low-carbon operations (Heinkel, Kraus, and Zechner 2001). Rich evidence has been documented showing that firms with environmental concerns have a less diversified investor base and a higher cost of capital (Seltzer, Starks, and Zhu 2020; Painter 2020; Battiston and Monasterolo 2020; de Greiff, Delis, and Ongena 2018; Ng and Rezaee 2015; and Beirne, Renzhi, and Volz 2020), while firms pursuing E&S practices, such as issuing green bonds, benefit from better investor profiles and a lower cost of capital (Ghoul et al. 2011, Chava 2014).

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Box 8: Economic Consequences of Green and Social Finance

Green and social finance helps mobilize funding resources for investments with environmental and social impacts.^a Aside from contributing to positive social externalities, it is important for policy makers, companies, investors, and various stakeholders to also understand the economic consequences of green and social finance. Such knowledge will facilitate policy making and increase market participation in green and social finance for sustainable development.

The literature has extensively discussed the economic impact of green and social finance from different aspects such as company value, cost of funding, employment, green innovation, and investor base. From the business and shareholder perspective, tapping green and social finance has positive impacts on firm value, and it therefore benefits shareholders. The literature has also documented that firms with superior social responsibility and environmental, social, and governance (ESG) performances have a lower cost of capital, a better credit rating, and improved financial performance (Goss and Roberts 2011, Chava 2014). Green and social finance provides direct funding for companies to make clean investments in climate change mitigation and adaptation, and signals a commitment to emissions reduction and sustainable production. With increasing awareness of social responsibility among the investor community, such signals generate positive feedback from financial markets, which benefits companies through higher firm values, lower funding costs, and a broadened investor base.

Evidence has shown that tapping green and social financing is related to higher firm values. Tang and Zhang (2020) showed that when companies announce a green bond issuance, their stocks witnessed an average 1.72% cumulative abnormal return over a 20-day event window and had about 7% more liquidity compared with matched firms. The authors attribute this favorable market reaction to positive signaling, better information transparency, greater investor attention, and an expanded investor base. Flammer (2020) also documented how positive stock market reactions to green bond issuance announcements are stronger for first-time green bond issuers and certified green bond issuers. Zhou and Cui (2019) found that companies' green bond issuances are associated with improved profitability such as return on invested capital, net profit margin on sales, and return on assets.

As a leading green and social finance instrument, the cost of green bonds has attracted extensive discussion. Green bonds

are documented to generate similar or lower costs compared to matched conventional bonds (Ehlers and Packer 2017, Baker et al. 2018, Hachenberg and Schiereck 2018, and Zerbib 2019). A strong environmental commitment—as evidenced by green labels, green bond certification, and independent verification—also generates significant cost advantages for green bond issuers. Such issuers benefit from a yield reduction of 8 basis points compared to conventional bonds (Gianfrate and Peri 2019) and 6 basis points relative to peer green bonds (Hyun, Park, and Tian 2020). One key driver for the yield benefit on green bonds is the high demand for green bonds given their limited supply.^b The Climate Bonds Initiative has frequently reported oversubscriptions for new green bond offerings in its series of market monitoring reports, indicating prevailing investor perceptions of excess demand for green bonds relative to supply.

The cost convenience of green bonds also holds when compared to bank loans. Alonso-Conde and Rojo-Suárez (2020) evaluated the impacts of green bonds versus conventional bank loan financing on the profitability of an environmentally friendly project. They found that investments financed by green bonds earn a higher internal rate of return for shareholders, which was driven by the lower financing costs of green bonds relative to bank loans. They argue that green finance provides economic and financial incentives for shareholders of green projects and helps align shareholders' objectives with the United Nations Sustainable Development Goals.

In addition to higher firm values and lower costs, tapping green and social financing has been shown to broaden the issuer base and attract new types of investors such as ethical investors and socially responsible investment funds. Giudice (2017) summarized a number of studies conducted by major investment banks and found that around 89% of all investors expressed an interest in or are familiar with sustainable investments, and 65% of them are already conducting sustainable investing. Rising awareness of sustainable investments enables the broadening of the investor base as companies signal their environmental and social commitment by tapping social and green finance. Empirical evidence indicates that green bond issuances help sovereigns and corporates attract new investors and that these green bond investors have a long-term investment horizon. By issuing green bonds, companies see increased bond ownership among long-term and ethical investors (Flammer 2020).

^a This box was written by Shu Tian (Economist) and Mai Lin Villaruel (Economics Officer) in the Economic Research and Regional Cooperation Department of the Asian Development Bank. Research assistance from Adam Zhou of Harvard University is greatly appreciated.

^b For example, see Climate Bonds Initiative. 2019. *Green Bond Pricing in the Primary Market and Green Bonds Market 2019*. <http://climatebonds.net>.

Box 8: Economic Consequences of Green and Social Finance *continued*

From the investor perspective, instruments that feature environmental and social impacts not only deliver positive externalities but also offer greater resilience during shocks and help hedge against systematic risk, idiosyncratic risk, and climate-change-related risk. Nemoto and Lian (2020) showed that Japanese firms with higher corporate social responsibility rankings demonstrated greater resilience amid market turmoil in the first quarter of 2020 resulting from the coronavirus disease (COVID-19) outbreak. Amundi (2020) found that during the market sell-off in March 2020, ESG-themed funds showed greater resilience than conventional funds, with 62% of large ESG funds outperforming the MSCI World Index.

In addition, investing in green- and social-themed instruments helps investors to meet client demand and preferences for sustainability and responsibility. During the past decade, increasing awareness of climate change has directed more funding into many sustainability-themed sectors, such as clean energy, green building, sustainable transport, energy efficiency, pollution prevention, climate adaptation, and sustainable agriculture (Lee, Thwing-Eastman, and Marshall 2020). Such awareness among stakeholders has also directed investors, especially institutional investors, to invest in environmental initiatives. Recent developments in the green and social finance market—such as international standards, principles, and independent certifiers—has strengthened investor confidence in terms of reputation risk.

Green and social finance also provides funding to support a low-carbon transition. Policy makers face complex decision-making scenarios in which some sectors will be negatively affected during the redistribution of investment toward a low-carbon economy. Evidence shows that green and social finance contributes to economic development by directing investment toward high value-added sectors. Glomsrød and Taoyuan (2016, 2018) found that green finance (i.e., labeled green bonds) can help shift investment from coal industries to other high value-added industries, which will increase future savings and investment, and lead to a 1.6% increase in gross domestic product among sample economies. The reallocation of investment via green finance also leads to a 2%–4% lower rate of return on capital, as well as income redistribution since income is shifted from investors to wage earners. The income redistribution also contributes to demand and gross domestic product growth.

Employment is a key factor to consider as the energy sector experiences low-carbon reform. Renewable energies are widely recognized for their potential for green job creation, given their less capital-intensive and more labor-intensive business nature. Ram, Aghahosseini, and Breyer (2020) argue that renewable technologies can create jobs during the low-carbon transition. Under the assumption that the world's electricity generation will be entirely from renewable sources by 2050, they project that the number of jobs directly related to energy will be 35 million globally, or 1.5 times as high as the 2015 level of around 21 million jobs, with solar photovoltaic replacing coal as the leading job-creating technology in the electricity sector and accounting for around 64% of total jobs in the sector by 2050. Green finance through the direct funding of low-carbon investments will contribute to employment and local economic development. Using both computable general equilibrium and input-output models, Perrier and Quirion (2018) find that shifting investment toward low-carbon sectors yields jobs if the investment is directed to sectors with relatively lower wages and a higher share of labor in value added. They suggest that a double dividend (employment and environmental) can be achieved by encouraging the development of low-carbon, labor-intensive sectors.

Another important issue that matters for economic development is innovation. Green and social finance can provide funding to facilitate innovation in green technologies. For example, Zhou and Cui (2019) showed that green bond issuance is positively associated with the innovation capacity of companies, as evidenced by year-on-year growth in total research and development expenses, and in research and development expenses as a share of total operational income. Green innovation has also been found to be positively related to firms' profitability (Aguilera-Caracuel and Ortiz-De-Mandojana 2013).

Green and social finance can facilitate the transition to an environmentally friendly and inclusive future. Besides the positive externalities it delivers, green and social finance can also provide the world with economic benefits. However, given the huge amount of funding needed to meet the pledged climate change targets, the size of green and social finance remains relatively small. Action is needed to develop the market and mobilize more resources to address social and environmental challenges.

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Box 8: Economic Consequences of Green and Social Finance *continued*

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