

Nothing is as powerful as an idea whose time has come.
— Victor Hugo

LOOKING FARTHER

Sustainable finance incorporates a large array of environmental, social, and governance (ESG) principles that are becoming increasingly important for borrowers and investors. ESG issues may have material impact on corporate performance and may give rise to financial stability risks via exposure of banks and insurers and large losses from climate change. The integration of ESG factors into firms' business models—prompted by regulators, businesses' own interest, or by investors—may help mitigate these risks. Despite the lack of consistent evidence of outperformance of sustainable investing strategies, investor interest in ESG factors has continued to rise in recent years. However, ESG-related disclosure remains fragmented and sparse, partly due to associated costs, the often voluntary nature of disclosure, and lack of standardization. Policymakers have a role to play in developing standards, fostering disclosure and transparency, and promoting integration of sustainability considerations into investments and business decisions.

What Is Sustainable Finance?

Sustainable finance is defined as the incorporation of environmental, social, and governance (ESG) principles into business decisions, economic development, and investment strategies. It is well established that sustainable finance can generate public good externalities (Principles for Responsible Investment 2017; Schoemaker 2017; United Nations 2016) where actions on an extensive set of issues (Figure 6.1, panel 1) generate positive impacts

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on society. Efforts to promote ESG considerations in finance started some 30 years ago and have accelerated more recently (Figure 6.1, panel 2).

There is an economic case for sustainable finance. Firms engage in “good” corporate behavior that has operational and disclosure costs but provides benefits to society for several reasons (Benabou and Tirole 2010). Firms may choose to invest in ESG projects in response to evolving investor or consumer preferences, a choice that could lower costs of capital or improve profit margins. Business investment in ESG may lead to a more motivated workforce (Edmans 2010), greater trust between firms and stakeholders (Lins, Servaes, and Tamayo 2017), or less firm-level tail risk from carbon emissions (Ilhan, Sautner, and Vilkov 2019). And firms may choose to become more ESG-friendly because of policy-driven actions, such as the cost of meeting forthcoming regulatory requirements that would make delayed compliance expensive. In the long term, ESG factors may prove important to firms' ability to navigate ESG-related risks and generate revenue while also benefiting society (“doing well by doing good”). There is still a question of whether these reasons are sufficient to ensure that all relevant externalities are fully reflected in firms' ESG considerations. For investors, the provision of information on how firms are incorporating ESG principles is a necessary step to incentivize firms to change, but generally this does not yet seem to be sufficient for adequate differentiation, as discussed below. Therefore, policy action is still needed to incentivize firms to carry out investment or make other changes in their business practices that would help reduce negative externalities, especially from climate-change-related risks (see also the October 2019 *Fiscal Monitor* for climate change policies).

Figure 6.1. Taxonomy of Environmental, Social, and Governance Issues and Relevant Stakeholders and Initiatives

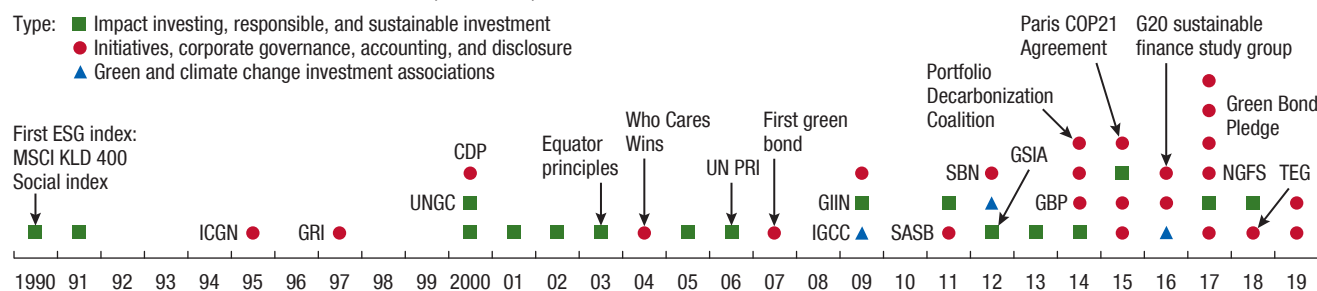
The scope of ESG factors is very wide.

1. Selected ESG Issues

Key Pillars	Key Themes	Key Issues	Key Issues
Environment	Climate change	Carbon footprint	Vulnerabilities from climate change events
	Natural resources	Energy efficiency Sourcing of raw materials	Water efficiency Usage of land
	Pollution and waste	Toxic emissions Wastewater management Hazardous materials management	Air quality Electronic waste management
	Opportunities and policy	Renewable energy Clean technology	Green buildings Environmental and biodiversity targets and investment
Social	Human capital	Workplace health and safety Development opportunities	Employee engagement, diversity, and inclusion Labor practices (e.g., wages, working conditions)
	Product responsibility	Product safety and quality Selling practices and product labeling	Customer privacy and data security Access to products
	Relations	Community Government	Civil society
Governance	Corporate governance	Board structure and accountability Accounting and disclosure practices	Executive compensation and management effectiveness Ownership and shareholder rights
	Corporate behavior	Management of corruption Systemic risk management Earnings quality	Competitive behavior Management of business environment (e.g., legal, regulations) Transparency on tax and related-party transactions

A major boost came with the launch of the Who Cares Wins initiative by the UN Global Compact in 2004. Sustainable investing in equities started in earnest with the launch of the UN Principles of Responsible Investment in 2006, and the issuance of green label bonds by multilateral development organizations in 2007 catalyzed growth for fixed income. Investors have also started to reassess their investment policies in light of growing awareness about climate change risks since the Paris COP21 and the 2015 UN Sustainable Development Goals; most countries have committed to emission mitigation.

2. Evolution of Selected ESG Finance Associations, Standards, and Codes



Sources: MSCI; Sustainability Accounting Standards Board; Refinitiv Datastream; WhoCaresWins; World Bank; and IMF staff.
 Note: For more information see also World Bank (2018) and the International Capital Markets Association. CDP = Carbon Disclosure Project; COP21 = 21st Conference of the Parties; ESG = environmental, social, and governance; GIIN = Global Impact Investing Network; GBP = Green Bond Principles; GRI = Global Reporting Initiative; GSIA = Global Sustainable Investment Alliance; ICGN = International Corporate Governance Network; IGCC = Investor Group on Climate Change; NGFS = Network for Greening the Financial System; SASB = Sustainability Accounting Standards Board; SBN = Sustainable Banking Network; TEG = EU Technical Experts Group on Sustainable Finance; UNGC = UN Global Compact; UN PRI = UN Principles for Responsible Investment.

Does Sustainable Finance Matter for Financial Performance and Stability?

ESG issues can have a material impact on firms' corporate performance and risk profile, and on the stability of the financial system. Governance failures at banks and corporations contributed to past financial crises,¹ including the Asian and the global financial crises. Social risks in the form of inequality may contribute to financial instability by triggering a political response of easier credit standards to support consumption despite stagnant incomes for middle- and lower-income groups (Rajan 2010). Environmental risk exposures can lead to large losses for firms,² and climate change may entail losses for financial institutions, asset owners, and firms. The integration of ESG factors into firms' business models—prompted either by regulators or by investors—may help mitigate these risks.

Climate change features prominently among ESG issues. Whereas sustainable finance spans a wide range of issues, awareness of climate-related financial risks has grown in recent years. Two channels have been identified (Figure 6.2, panel 1):³

- *Physical risks* that arise from damage to property, land, and infrastructure from catastrophic weather-related events and broader climate trends; and
- *Transition risks* that arise from changes in the price of stranded assets and broader economic disruption because of evolving climate policy, technology, and market sentiment during the adjustment to a lower-carbon economy.

The potential impact of climate risks is large, nonlinear, and hard to estimate. Losses from climate-related risks affect the financial system directly, through price impairment, reduced collateral values, and underwriting losses, and indirectly, through lower economic growth and tighter financial conditions. Insurance claims from natural losses have already quadrupled since the 1980s

(Figure 6.2, panel 2). As a result, insurance in exposed areas is costlier, and large, correlated natural disasters could lead to stress on insurers in the future. Financial risks from climate change are extremely difficult to quantify, but most studies point to very large economic and financial costs.⁴ Risks are not linear, and the catastrophic tail risks are not negligible. In the transition to a cleaner-energy economy, a sudden reassessment of valuations in exposed sectors could occur to the extent that asset prices do not fully internalize the risks posed by climate change. In addition, the far-reaching scope of climate change across sectors and countries adds to the systemic nature of risks. Climate change mitigation costs per unit of emission are likely to fall on industrialized economies under “common but different responsibilities” given that most future low-cost mitigation opportunities are in large emerging market economies (October 2019 *Fiscal Monitor*; De Cian and others 2016). Lower- and middle-income countries are very vulnerable, partly reflecting geography, dependence on agriculture, and lack of resources for climate change adaptation (IMF 2019).

A growing awareness of ESG risks more broadly will likely raise the costs of noncompliance with ESG standards. Legal risks for investors and companies stem from parties who have suffered climate-related losses seeking compensation from those they hold responsible.⁵ Failure to disclose the risks posed to business models and portfolios by climate change and other ESG risks is another liability for investors. As ESG investment strategies are more widely adopted, issuers will be exposed to investor decisions on ESG guidelines.⁶ For example, a growing number of asset owners have pledged to divest from fossil fuels (Figure 6.2, panel 3), and major banks and insurers have committed to curtailing financing or insuring the sector. In combination with regulatory actions, large-scale divestments can have a significant effect

¹Chapter 3 of the October 2014 *Global Financial Stability Report* (GFSR) found that weak bank governance leads to excessive risk taking, which contributed to the global financial crisis. Chapter 3 of the October 2016 GFSR highlighted that stronger corporate governance and investor protection frameworks enhanced emerging market economies' resilience to global financial shocks.

²Examples of environmental risk exposures that have led to large losses and bankruptcies include corporate liabilities related to asbestos, toxic spills in the mining industry, and chemical plant explosions.

³For a discussion of financial stability risks from climate change see Carney (2015); IMF (2016); European Systemic Risk Board (2016); Bank of England Prudential Regulatory Authority (2018); European Central Bank (2019); Lane (2019); and Network for Greening the Financial System (2019).

⁴Burke, Hsiang, and Miguel (2015) suggest that average global incomes may be reduced by up to a quarter by 2100. For financial losses, the Cambridge Centre for Risk Studies (2015) estimates losses in trillions of dollars, and the Economist Intelligence Unit (2015) estimates that the value of typical equity portfolios could decline by half. A group of large listed companies expects climate change costs to rise to \$1 trillion (CDP 2019).

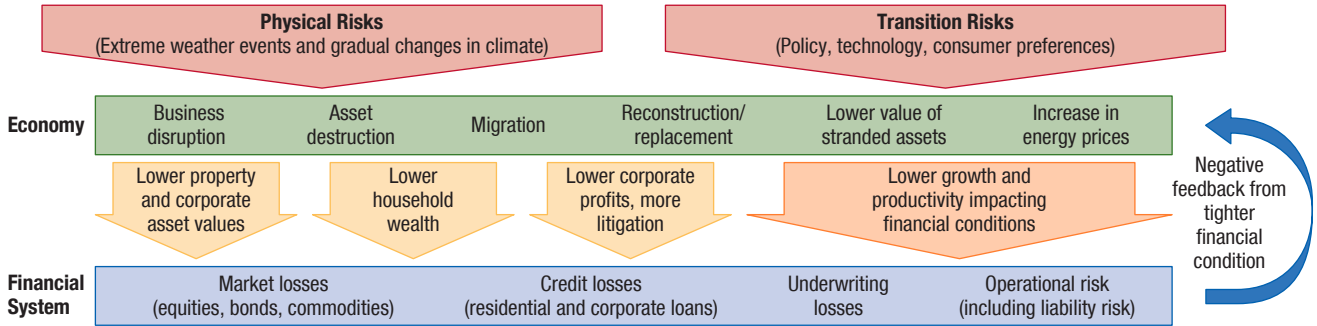
⁵For example, there is a growing number of lawsuits in the United States brought by local authorities against fossil fuel companies, seeking compensation for the costs of climate adaptation.

⁶Large shifts in investment portfolios due to changes in ESG guidelines could pose risks through disorderly price corrections similar to shifts in traditional benchmark-driven investment (see April 2019 GFSR for benchmark-driven investing).

Figure 6.2. Financial Stability Risks from Climate Change

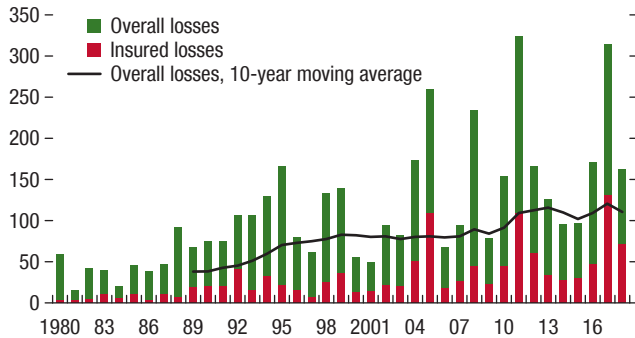
Extreme weather events, gradual changes in climate, and disruptions associated with the transition to a low carbon economy can affect asset prices and financial stability.

1. Physical and Transition Risks from Climate Change (adapted from NGFS)



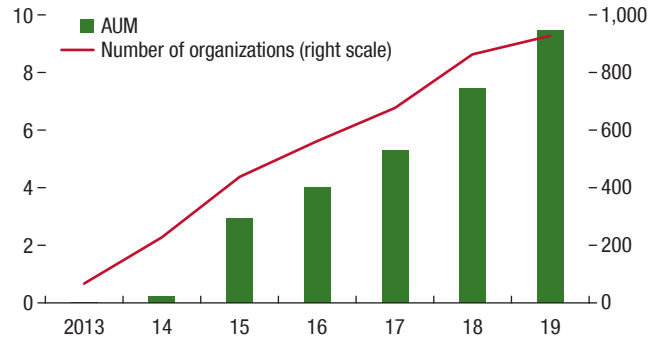
Losses from natural disasters have increased in recent decades ...

2. Overall and Insured Losses for Relevant Natural Loss Events Worldwide 1980–2018 (Billions of 2018 US dollars)



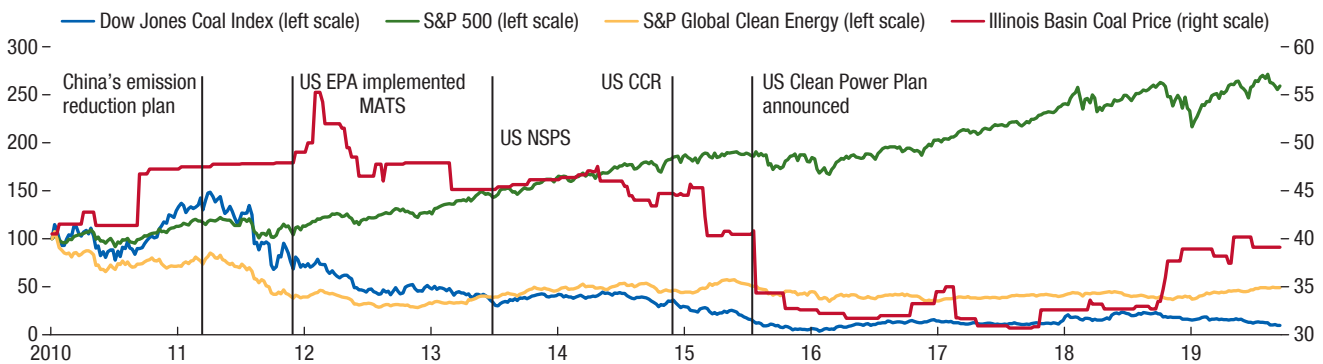
... and an increasing number of institutional investors are divesting from fossil fuel activities.

3. Institutional Investor Fossil Fuel Divestment Pledges (Cumulative; left scale: trillions of US dollars; right scale: number of organizations)



Transition risks are already materializing in the coal sector.

4. US Coal Sector Valuations and Regulatory Announcements (Left scale: Indexes normalized end-2010 = 100; right scale: US dollars per short ton)



Sources: 350.org; Bank of England; Bloomberg Finance L.P.; Münchener Rückversicherungs-Gesellschaft; NatCatSERVICE; Network for Greening the Financial System; and IMF staff calculations.

Note: In panel 3, 2019 data are until July 2019. AUM = assets under management; CCR = disposal of coal combustion residuals from electric utilities; EPA = Environmental Protection Agency; MATS = mercury and air toxics standards; NGFS = Network for Greening the Financial System; NSPS = new source performance standards for power plants.

on exposed sectors such as coal by making capital and insurance more difficult and costlier to obtain (Figure 6.2, panel 4). Sovereigns are also at risk from ESG noncompliance, with rating agencies and large investors increasingly incorporating ESG considerations into their sovereign credit assessments.⁷

Is There a Case for ESG-Linked Portfolio Investment?

Portfolio investors are increasingly focusing on ESG considerations. This practice started in equity investments by investors seeking long-term value-creating information or trying to avoid specific risk exposures (such as tobacco and munitions) that might cause reputational damage. Application of ESG factors to fixed income assets (Figure 6.3, panel 1) followed with self-declaration and labeling by issuers (as in the case of green bonds). Labeled bonds usually carry a certification process for their use of proceeds with periodic validation, but investors generally rely on voluntary disclosures. Further incorporation of ESG factors is taking place through ratings where credit rating and other agencies attempt to support their credit risk assessment with nonfinancial material information arising from sustainability considerations and, generally, apply these considerations to a broader set of issuers (not necessarily labeled bond issuers). ESG application to private markets is aided by a longer time horizon and greater scope for investor activism. The lack of consistent definitions makes it difficult to pinpoint the global asset size related to ESG, with estimates ranging from \$3 trillion (J.P. Morgan 2019) to \$31 trillion (Global Sustainable Investment Alliance 2019).

Impact and underperformance concerns have led the evolution of ESG strategies from exclusions to more selective inclusion and investor activism. Initially, sustainable investing was primarily about *negative screening* strategies that excluded firms or entire sectors from investment portfolios. Over time, concerns about risk management, benchmark underperformance, and a need to demonstrate material ultimate impact have given rise to strategies based on *positive screening* for companies with good ESG performance (best-in-class, improvement), companies that fulfill certain minimum standards or norms (norm-based screening), or sectors that are considered sustainable (sustainability-themed investments).

⁷Asset managers such as PIMCO and Blackrock have incorporated ESG principles in their investment assessment.

Increasingly, ESG information is explicitly and systematically integrated into all investment analysis and investment decisions (Figure 6.3, panel 2).

Sustainable investing started in equities, but greater recognition of the importance of ESG standards and official sector sponsorship is boosting sustainable fixed income. ESG integration grew earlier in equities (Figure 6.4) because of considerations about risk and reward, time horizon, and engagement rights. Sustainable fixed income investing is benefiting from growing recognition that ESG issues present material credit risk. Bond development has been aided by issuance by multilaterals (International Bank for Reconstruction and Development, European Investment Bank); development of standards by China, the European Commission, the United Nations, and the United Kingdom, among others; and greater incorporation of ESG factors in credit ratings (Figure 6.5, panel 1). Labeled bonds—primarily green bonds at this point—are a fast-growing and important segment. Strong investor demand spurred strong issuance by European investment-grade and, more recently, Chinese issuers, growing the stock to an estimated \$590 billion in August 2019 from \$78 billion in 2015 (Figure 6.5, panels 2–4). Nonetheless, there is little evidence that issuers achieve lower costs through green bonds than conventional bonds, likely reflecting the identical credit risk profile. Secondary market liquidity appears to be slightly worse for green bonds than for comparable conventional bonds, reflecting the large role of buy-and-hold investors (Figure 6.5, panels 5 and 6).

For investors, the willingness to invest sustainably coexists with performance considerations. There is no conclusive evidence in the literature that sustainable funds consistently out- or underperform conventional funds.⁸ Restricted investment can reduce diversification benefits and limit investment opportunities, leading

⁸For example, Renneboog, Ter Horst, and Zhang (2008) find that risk-adjusted returns of sustainable and responsible investment funds are not statistically different from conventional funds. More recently Nofsinger and Varma (2014) found that ESG funds outperform during crises but underperform during normal periods. On the other hand, Khan, Serafeim, and Yoon (2016) find that firms with good sustainability ratings outperform those with poor ratings in some areas. Papaioannou and Rentsendorj (2015) show that the Norway Government Pension Fund Global's long-term returns are well within its set objectives, notwithstanding its close adherence to ESG principles. The lack of conclusive evidence on the performance of ESG funds and assets likely reflects a combination of factors, including varying definitions of material ESG factors and ESG investment approaches (studies are not comparable), data inconsistencies and short time series, and the long-term nature of some ESG issues.

Figure 6.3. Sustainable Investment Strategies across Asset Classes

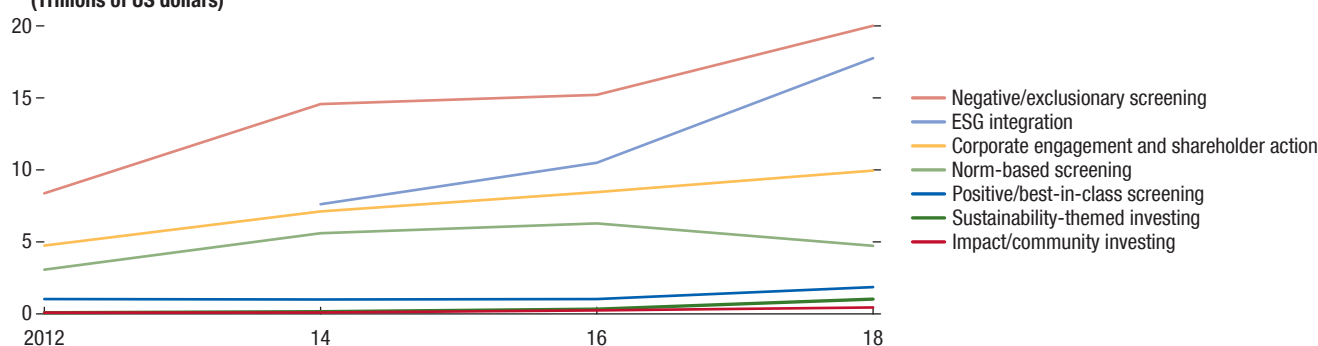
ESG is not an asset class but a multidimensional assessment system that can be applied to any asset class.

1. Application of ESG Factors Across Asset Classes

Asset Class	Breakdown	Examples
Equities	—	ESG can be adopted in traditional equities through a number of strategies. The most prominent has been negative (exclusionary) screening over the years, but it has moved to others such as engagement and positive (best-in-class) screening.
Debt Fixed Income	Traditional corporate bonds	Incorporating material ESG criteria into corporate credit analysis to better identify credit risk.
	Traditional sovereign bonds	Integrating ESG factors, together with traditional analysis that focuses on financial and macroeconomic variables to identify sovereign credit risks. PIMCO has adopted this approach since 2011 in its sovereign ratings model.
	ESG money market funds	Applying ESG factors to the investment of money market instruments. BlackRock, for example, launched an environmentally focused money market fund in April 2019.
	Green bonds	Specific bonds that are labeled green, with proceeds used for funding new and existing projects with environmental benefits.
	Social bonds	Bonds that raise funds for new and existing projects that create positive social outcomes.
	Sustainability bonds	Bonds with proceeds that are used to finance or refinance a combination of green and social projects.
	Green mortgage-backed securities (MBS)	Green MBS securitize numerous mortgages that go toward financing green properties, in the case of Fannie Mae, which is the largest issuer of green MBS.
Debt Bank Loans	Green loans	Loans that have proceeds used to finance or refinance green projects, including other related and supporting expenditures such as R&D. Their size is 70–80 percent smaller than green bonds, but they have been growing fast in 2018–19.
	Sustainability-linked loans	Loan instruments and/or contingent facilities such as guarantees or letters of credit that incentivize the borrower to meet predetermined sustainability performance goals.
Alternative Investment	Green real estate investment trusts (REIT)	REITs with a portfolio exposure to properties that are environmentally certified.
	Private equity (PE) and venture capital (VC)	Private funds that, for example, back startups in areas such as energy, mobility, and buildings.

The initial foray into responsible investment strategies was primarily about negative screening strategies that excluded firms or entire sectors from investment portfolios, often on ethical or religious grounds (for example, tobacco, alcohol, munitions, and gaming). Impact investing, a relatively small but growing part of the market, aims at making a measurable impact on specific societal issues.

2. Net Asset Value of Funds by Investment Strategy (Trillions of US dollars)

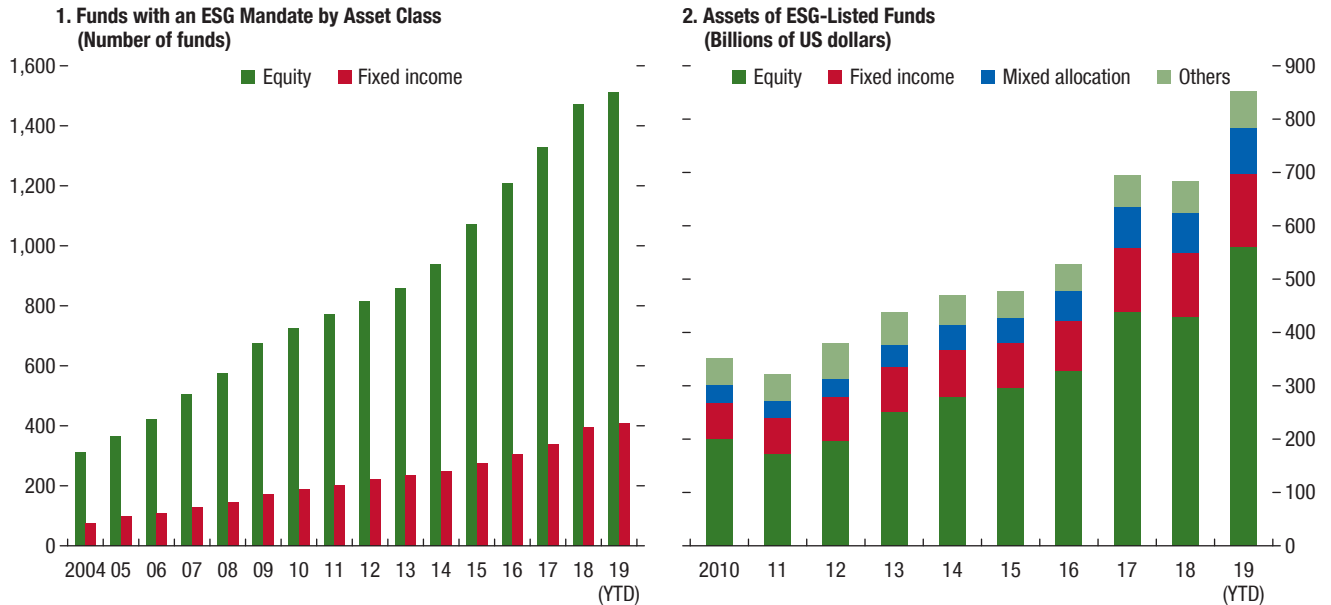


Sources: Global Sustainable Investment Report; and IMF staff calculations.

Note: In panel 1, Fannie Mae is the first issuer of green mortgage-backed securities through the Fannie Mae Multifamily Green Bond Framework. Several banks have issued loans with rates tied to the borrowers' sustainability performance to incentivize ESG performance (for example, if the sustainability rating of the borrower improves, the interest rate on the loan declines). ESG = environmental, social, and governance; R&D = research and development.

Figure 6.4. Growth of ESG-Dedicated Funds

ESG funds are still small compared with mainstream investment funds, controlling some \$850 billion in assets (less than 2 percent of the total investment fund universe), but are rising fast. Equity funds traditionally had a much faster adoption rate of ESG factors than fixed income. ESG equity funds have reached \$560 billion in 2019.



Sources: Bloomberg Finance L.P.; JPMorgan Chase & Co.; and IMF staff calculations.

Note: In panels 1 and 2, 2019 data are as of September 2019. ESG = environmental, social, and governance; YTD = year to date.

to underperformance. For example, restrictions could result in more volatile portfolios (Figure 6.6, panel 1). But ESG factors may allow asset managers to identify companies with higher long-term-value creation (Eccles, Ioannou, and Serafeim 2014) and avoid assets with mispriced costs from extreme events like climate change. IMF staff analysis suggests that the performance of sustainable and conventional funds is comparable (Figure 6.6, panel 2). In the absence of clear evidence of underperformance of ESG funds, investors have justified allocation to ESG funds on the basis of similar fees between ESG and regular funds (Figure 6.6, panel 3). Nonetheless, anecdotal evidence suggests that fees of sustainable active management funds are often higher than those of other active funds, posing a hurdle for wider adoption, especially by public pension funds.

What Are the Challenges Faced by ESG Investors and Issuers?

The lack of consistent methodologies and reporting standards, and mixed evidence of performance make it challenging for investors to incorporate ESG

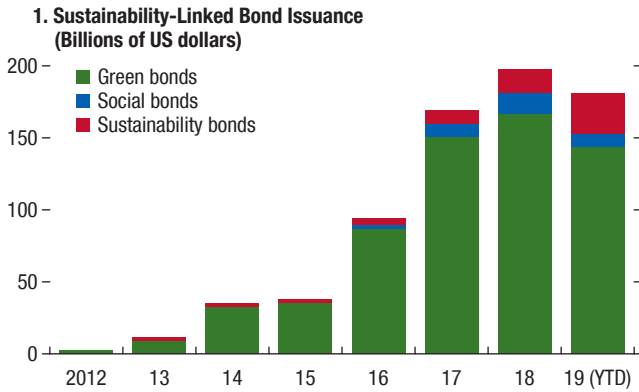
principles into their investment process.⁹ Corporate reporting is largely voluntary and inconsistent, and particularly sparse with respect to environmental and social dimensions, even though ESG disclosure has been improving over time (Figure 6.7, panels 1 and 2). Third-party providers of ESG scores aim to provide standardized assessments, but there are concerns about the opaqueness of methodologies and informational materiality. ESG scores across providers are also often inconsistent, and there seems to be little correlation between the informational content of ESG scores and investor perception of a firm's enterprise value (Figure 6.7, panels 3 and 4).

False claims of ESG compliance of assets and funds, so-called greenwashing, may give rise to reputational risk. Investment fund classifications can be inconsistent. For example, only 37 percent of Lipper ethical funds also carry a "sustainable" designation by Bloomberg. More broadly, there is uncertainty when it comes to measuring ESG impact: activist,

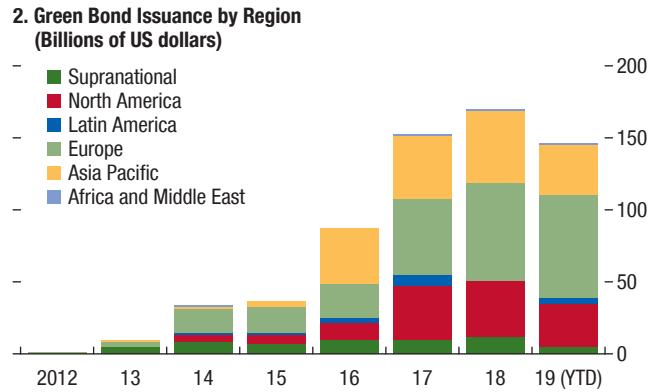
⁹Investor surveys show that data comparability across firms and time, data quality, and timeliness are concerns (Amel-Zadeh and Serafeim 2018).

Figure 6.5. Developments in Global Sustainable Debt Markets

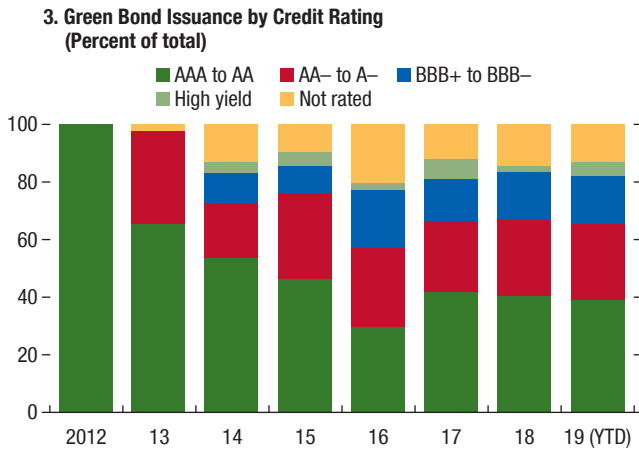
Global sustainability-linked bond issuance has been led by green bonds.



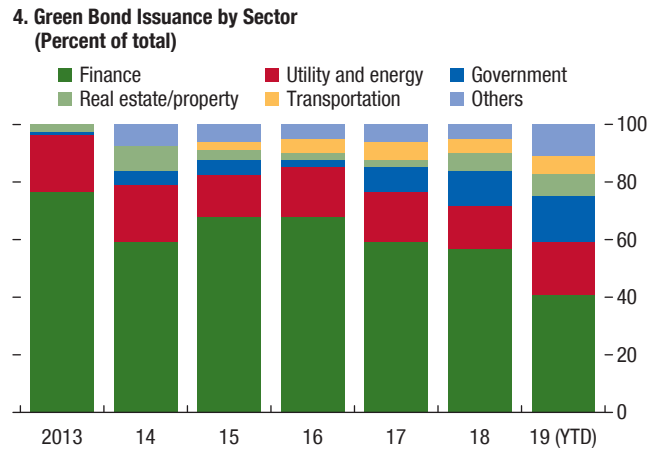
Europe has driven global issuance, but the Asia-Pacific region is catching up rapidly because of China.



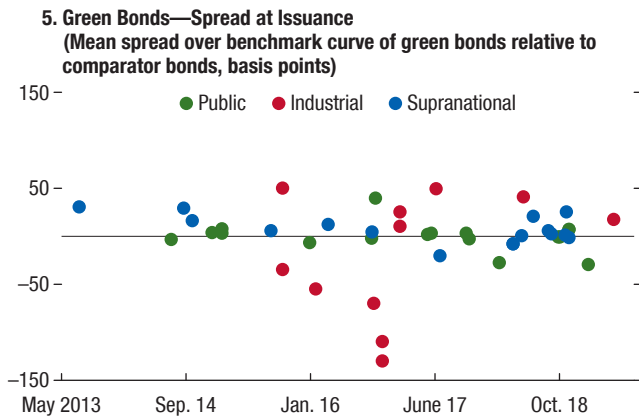
Credit quality has become more diverse, but most green bonds are highly rated, with a small fraction below investment grade.



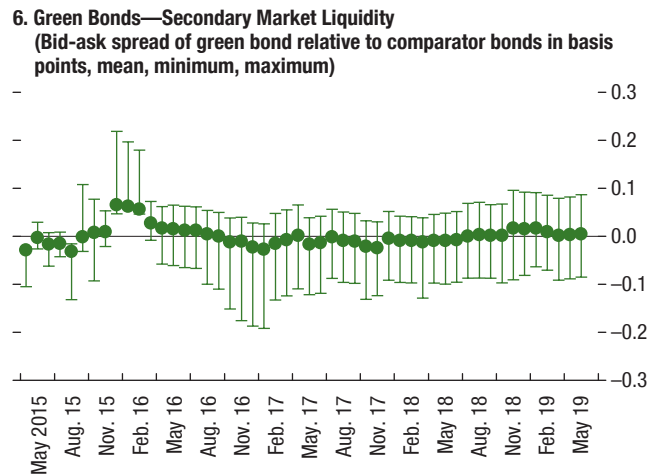
Issuers of green bonds tend to be concentrated in a few sectors.



There is no consistent premium or discount at issuance between green and non-green bonds by the same issuer ...



... but secondary market liquidity is slightly worse, possibly driven by the nature of the buy-and-hold investor base.

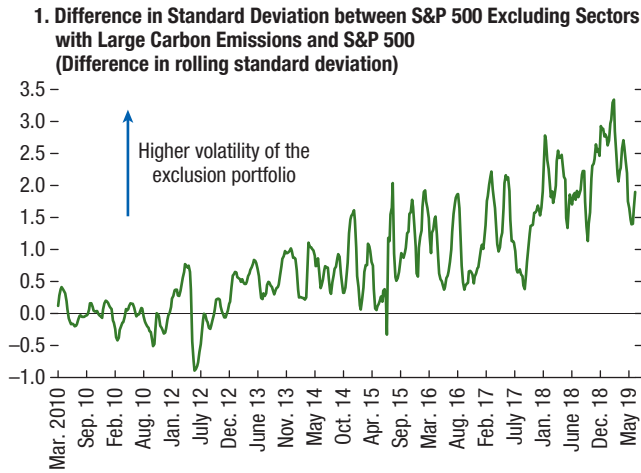


Sources: Bloomberg Finance L.P.; Dealogic; Fannie Mae; Refinitiv Datastream; and IMF staff calculations.

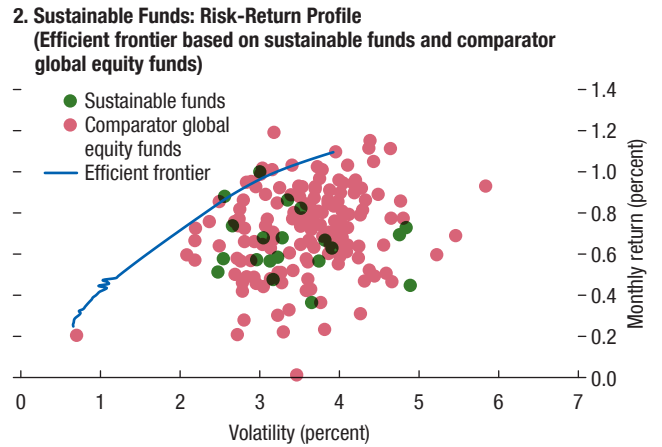
Note: 2019 year-to-date (YTD) data are until August 2019. In panel 1, sustainability-linked bonds are a broader classification that includes green, social, and sustainability bonds. See Figure 6.3, panel 1, for further explanation of each type of bond. Green bond issuance globally reached \$168.4 billion in 2018. In panel 2, green bond issuance by Africa and the Middle East was only \$97 million in 2018; it was \$600 million for the first eight months of 2019. In panel 3, AAA rated bonds accounted for an average of 30 percent of overall issuance from 2015 to 2018. In panel 4, "Finance" includes development banks and other financial institutions.

Figure 6.6. Environmental, Social, and Governance Fund Performance

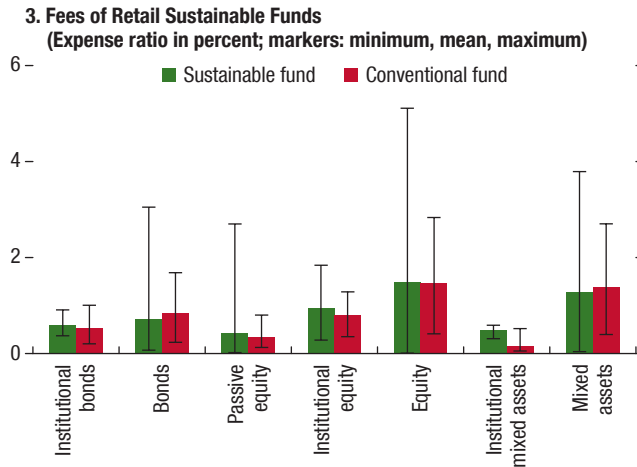
Simple exclusion rules can increase the volatility of equity portfolios.



There is no consistent evidence that sustainable funds regularly over- or underperform ...



... but, at least, fees of sustainable funds are comparable to those of their conventional peers for some retail funds.



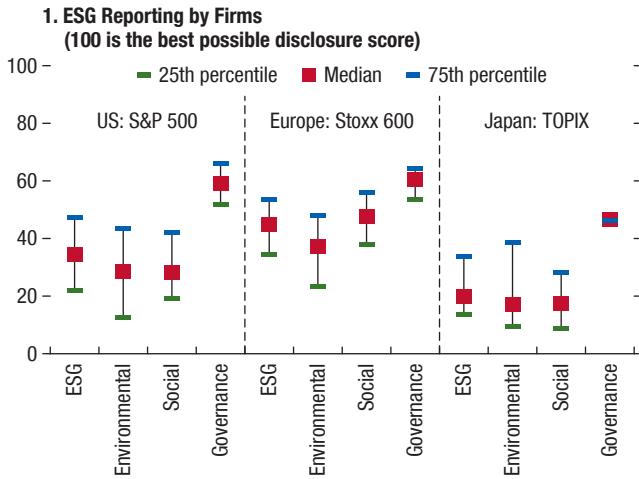
Sources: Bloomberg Finance L.P.; Morningstar; Refinitiv Datastream; and IMF staff calculations.

engagement, or positive screening approaches potentially have a greater impact than negative screening but measuring ESG effects remains challenging. Indices that track assets based on ESG criteria have opened the market to passive investors, but further fund and asset standardization may be needed to match investor expectations regarding ESG compliance. Prima facie, passive investing is not conducive to sustainable investing, given the need for greater engagement with issuers and higher analytical burden and cost, and may prove less effective in generating impact.

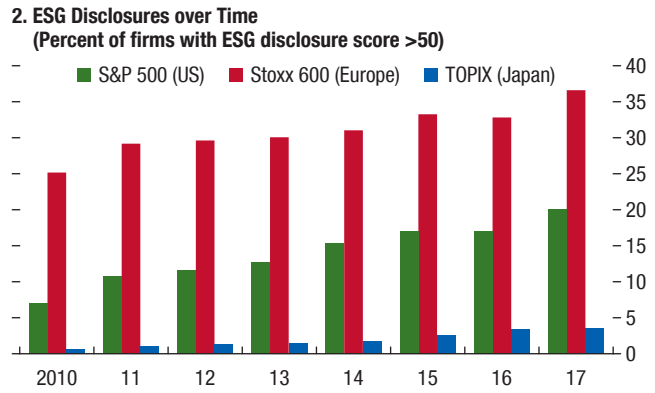
Issuers of ESG-compliant assets face challenges as well. Although firms can benefit from integrating ESG factors into their business models, they also face difficulties in realizing immediate gains, in part due to the long-term nature of the positive externality. Other obstacles include the currently high cost of ESG reporting, expensive and complicated external review procedures, and a lack of eligible assets. The complexity and unclear definitions of the E, the S, and the G affect issuers as well through exposure to reputational risk.

Figure 6.7. Challenges in Environmental, Social, and Governance Investments

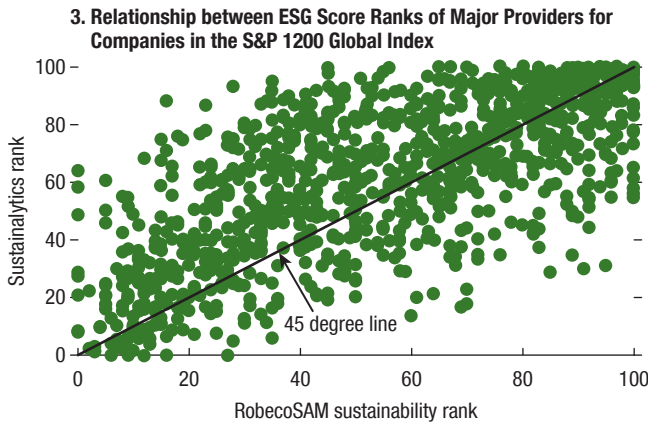
Corporate reporting on ESG factors is limited and lacks standardization ...



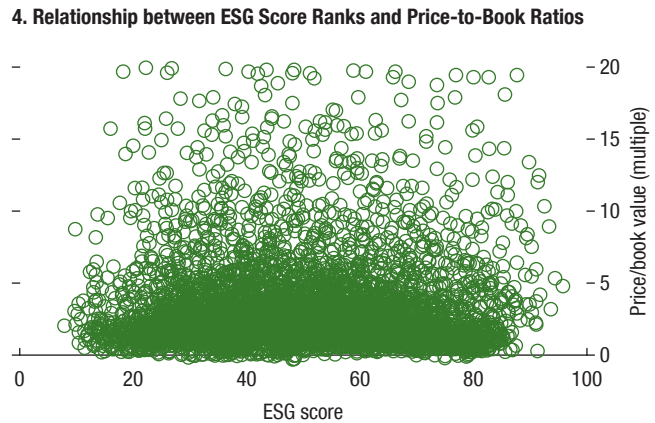
... despite improved ESG disclosures in recent years.



ESG scoring methodologies vary, partially reflecting the lack of a generally accepted ESG taxonomy ...



... and are further complicated by little apparent correlation between ESG scores and corporate valuations.



Sources: Bloomberg Finance L.P.; Refinitiv Datastream; RobecoSAM; Sustainalytics; and IMF staff calculations.
Note: In panel 4, the data are for all companies with Refinitiv Datastream ESG ratings. ESG = environmental, social, and governance.

Policies to Foster Further Development of Sustainable Finance

The development of sustainable finance has been driven by a combination of market forces and policymaker actions aimed to improve disclosure, data, and risk analytics. Closing data gaps will be crucial for investors and issuers to efficiently price externalities, mitigate risks, and reward long-term benefits from sustainability. More and better data can also help inform public policy if the outcome of market-based mechanisms is not sufficient in the face of significant negative externalities.

To encourage further growth in sustainable finance, progress is needed in the following areas:

- Standardization of ESG investment terminology, product definitions, and clarifications of what constitutes E, S, and G could support market development, address greenwashing concerns, and reduce reputational risk. Work is underway to develop an ESG taxonomy in the European Union by the European Commission (on a recommendation by the EU Technical Expert Group on Sustainable Finance 2019b), and various jurisdictions have either published or are developing green bond standards.

- Consistent corporate ESG reporting would incentivize acquisition of ESG data and assessment of financial materiality by investors.¹⁰ Consideration could be given to mandatory minimum ESG disclosure requirements, especially of financially material information, taking into account costs and complexities of new regulations and reporting requirements. ESG disclosure and reporting requirements for asset managers could help investors better assess ESG risk exposures. Better ESG data would also aid regulators in financial stability analysis.
- Clarification of the role of ESG factors in prudent investment governance by regulators would help reduce uncertainty regarding fiduciary duties among some investors. Reconciling fiduciary responsibility with long-term goals through clear metrics can provide clearer objectives to asset managers, institutional investors, and service providers, such as credit rating agencies and pension funds' investment consultants ("gatekeepers").

Regulators and central banks can further support the development of ESG-related markets by fostering awareness and offering intellectual leadership in assessing ESG risks. Policymakers should incorporate ESG principles, and climate-related financial risks in particular, into financial stability monitoring and assessment and into microsupervision (such as stress testing). They could consider incentives to jump-start green finance markets (such as Singapore's sustainable bond grant program¹¹ and expansion of collateral by the People's Bank of China for a lending facility to include green bonds).

Credit rating agencies and ESG data providers can further integrate material ESG information into credit ratings and other scores, aggregate relevant information,

¹⁰Initiatives such as the Sustainability Accounting Standards Board, Task Force on Climate-Related Financial Disclosures, and Global Reporting Initiative aim to fill this gap. In 2019 the Principles for Responsible Investment incorporated mandatory climate risk reporting. A new European Union disclosure regulation aims to mandate disclosure requirements.

¹¹Under this program, the Monetary Authority of Singapore awards grants to first-time and repeat issuers of labeled bonds to cover costs incurred for independent external review or rating of issues.

and design reliable metrics for ESG benchmarks.¹² Credit agencies have taken significant steps in incorporating ESG principles into their assessment of credit of issuers. Third-party verifiers play an important role in certifying the compliance of sustainable investment products with ESG criteria. EU regulation on integrating sustainability risks in credit rating agencies is underway, and regulators should consider developing standards and accountability for third-party verifiers and auditors.

The IMF will continue to incorporate ESG-related considerations, in particular related to climate change, when critical to the macroeconomy. The IMF is incorporating climate change into multilateral (October 2019 *Fiscal Monitor*) and bilateral surveillance (through analysis in Article IV consultations and in Financial Sector Assessment Programs, including in stress tests). To better understand the long-term consequences of ESG-related risk factors, including but not limited to climate change, additional research is planned in the April 2020 GFSR.

Multilateral cooperation can help bridge gaps in supervisory capacity on ESG issues. To the extent that data gaps are identified relating to disclosure at the national level, countries should also seek to remediate them. In the area of standards and taxonomies, multilateral cooperation is important to avoid fragmentation of sustainable asset markets.

More fundamentally, although finance can help mobilize funding to achieve sustainability goals and ensure that risks are appropriately priced, policies and regulations are needed to set price signals for markets. In this regard, fiscal measures, including pricing of externalities such as carbon emissions and phasing out fuel subsidies (see Chapter 2 of the October 2019 *Fiscal Monitor*), as well as structural policies supporting investment in climate infrastructure (Jobst and Pazarbasioglu 2019), are particularly important to encourage more sustainable approaches by consumers and businesses.

¹²Governance-related factors have traditionally featured in credit ratings. More recently, credit rating agencies are expanding the scope of ESG information that enters ratings, with due attention to materiality. The European Union via its green bond standards is seeking to clarify the responsibility of third-party verifiers of emissions (see EU Technical Expert Group on Sustainable Finance 2019a).

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