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Aligning Impact and Income

The Next Generation of Green Bond Indices

INTRODUCTION

When S&P DJI's first green bond indices, such as the S&P Green Bond Index, where launched in 2014, the flurry of new products related to the indices was seen as a key indicator that the green bond market was rapidly scaling new heights.

Since then, market growth, asset owner commitments, new principles and taxonomies, and the diversification of types of issuers and issuances have added gravitas to fixed income instruments with a green and socially responsible focus. These indices might have been perceived as niche, but they had never left the mainstream.

In 2017, S&P Dow Jones Indices is once again at the forefront of establishing further green bond momentum—this time through secondary market growth. The more recently launched S&P Green Bond Select Index forms the basis for one of the world's first green bond exchange-traded funds (ETFs). Although all types of investment products (actively managed and index based) are important in the continued development of the green bond market, the recent launch of ETFs will likely play an important role in its evolution.

This paper assesses opportunities and remaining challenges for green bonds as green finance investment instruments.

GREEN BONDS – A NEW ASSET CLASS?

Over the past few years, there has been increasing interest in a relatively new green capital markets instrument: green bonds. Green bonds are plain vanilla fixed income instruments created to fund projects that have environmental or climate-related benefits.

Green bonds can play an important role in engaging institutional market participants in the transition to a low-carbon and climate-resilient economy[1] in order to meet the United Nations Framework Convention on Climate

[1] World Bank, Zurich, Mirova, "Pension Fund Service Local Government," April 2015: http://treasury.worldbank.org/cmd/pdf/GettingtoKnowtheGreenBondMarket_PensionFundService.pdf.

Change goal (set in 2009)[2] of limiting global warming to 2°C above pre-industrial temperatures. Scaling up green bond issuances for green finance sustainable development has become a key area of focus, especially since the introduction (at COP 21 in 2015) and ratification of the Paris Agreement (2016).[3]

Since the first green-labeled bonds were issued by the European Investment Bank (Climate Awareness Bonds) in 2007[4] and the World Bank[5] in 2008, demand for green bonds has increased significantly.

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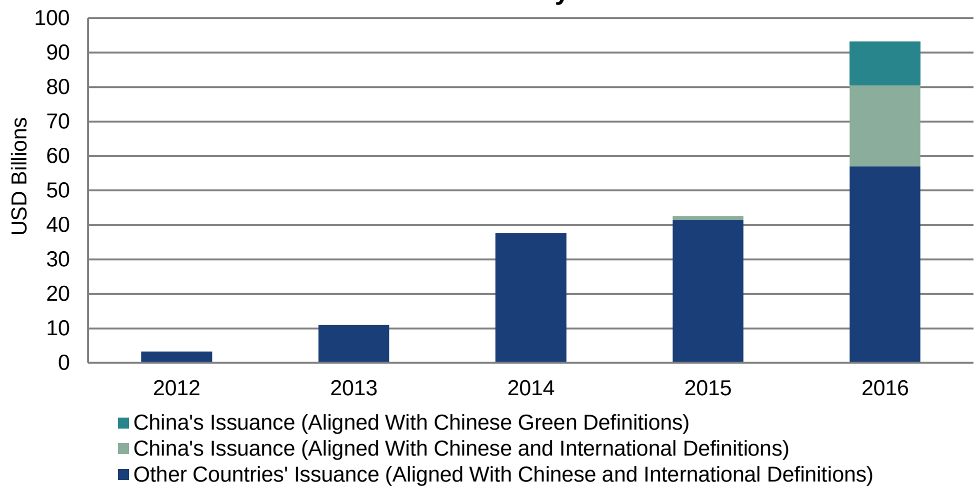
The total amount of green-labeled bond issuances amounted to USD 93.4 billion at the end of 2016,[6] and reflected strong China-based issuances (see Exhibit 1) and momentum from the Paris Agreement. Leveraging its 'AAA'/'Aaa' credit rating, the World Bank has issued over USD 9.7 billion in green bonds through more than 125 transactions in 18 currencies.[7]

Exhibit 1: Green Bond Market Growth Led by China



Source: Climate Bonds Initiative, China Green Bond Market 2016. Chart is provided for illustrative purposes.

According to a research report by Moody's (2017),[8] green bond issuance increased every year by an annual average of 163% between 2011 and 2015, and it set consecutive issuance records during 2013-2015. In 2017,

[2] UN, "Framework Convention on Climate Change," Copenhagen, Dec. 7-Dec. 8, 2009: http://unfccc.int/resource/docs/2009/cop15/eng/l07.pdf.

[3] UNFCCC, "Adoption of the Paris Agreement," Dec. 12, 2015: https://unfccc.int/resource/docs/2015/cop21/eng/l09.pdf.

[4] EIB, "EIB first CAB pioneered the Green Bond segment in 2007 and is the largest issuer of Green Bonds to date," October 2015: http://www.eib.org/investor_relations/press/2015/fi-2015-008-eib-is-first-to-link-individual-green-bonds-and-projects.htm.

[5] The World Bank, "World Bank and SEB partner with Scandinavian Institutional Investors to Finance 'Green' Projects," November 2008: http://treasury.worldbank.org/cmd/htm/GreenBond.html.

[6] Climate Bonds Initiative, "China Green Bond Market 2016," January 2017: https://www.climatebonds.net/files/files/SotM-2016-Final-WEB-A4.pdf.

[7] World Bank, "World Bank Green Bonds," 2017: http://treasury.worldbank.org/cmd/htm/WorldBankGreenBonds.html.

[8] Moody's Investor Service, "Global green bond issuance could rise to USD206B in 2017 after record in 2016," Jan. 18, 2017: https://www.moodys.com/research/Moodys-Global-green-bond-issuance-could-rise-to-USD206B-in--PR_360880.

labeled green bond issuances could reach up to USD 200 billion, according to the report.

In 2017, labeled green bond issuances could reach up to USD 200 billion.

More broadly, there is a growing engagement with and commitment to green finance and sustainable development within the investment industry.

- The number of signatories of the Principles for Responsible Investment (PRI; launched in 2006) has grown every year since the PRI were introduced in 2006. As of January 2017, there were more than 1,500 signatories and over USD 60 trillion of assets under management (AUM).[9]
- Interest in sustainable investment (SI) strategies is also impressive. Between 2012 and 2014, global SI assets increased to USD 21.4 trillion from USD 13.3 trillion—an increase of 61%. According to the "2014 Global Sustainable Investment Review" by GSIA (2015),[10] this outpaced the growth in total professionally managed assets.
- The "Montreal Pledge," which signifies a commitment to measure and disclose the carbon footprints of portfolios, has been signed by more than 120 market participants with over USD 10 trillion in AUM.[11] The "Portfolio Decarbonization Coalition," which commits institutional investors to reduce the carbon intensity of their portfolios, has grown substantially since it was launched in 2014. As of October 2016, it included 27 investors overseeing the decarbonization of USD 600 billion in commitments.[12]
- There is a growing public policy, investor, and corporate commitment to green finance and sustainable development initiatives in line with the Paris Agreement and the 2030 Agenda (adopted in 2015)[13]—and hence for initiatives and investment instruments linked to the Sustainable Development Goals (launched in 2015)[14] and to green bonds (see Exhibit 2).

[9] Principles for Responsible Investment (PRI), "About PRI," March 2017: https://www.unpri.org/about.

[10] GSIA, "2014 Global Sustainable Investment Review," 2015: http://www.gsi-alliance.org/members-resources/global-sustainable-investment-review-2014/.

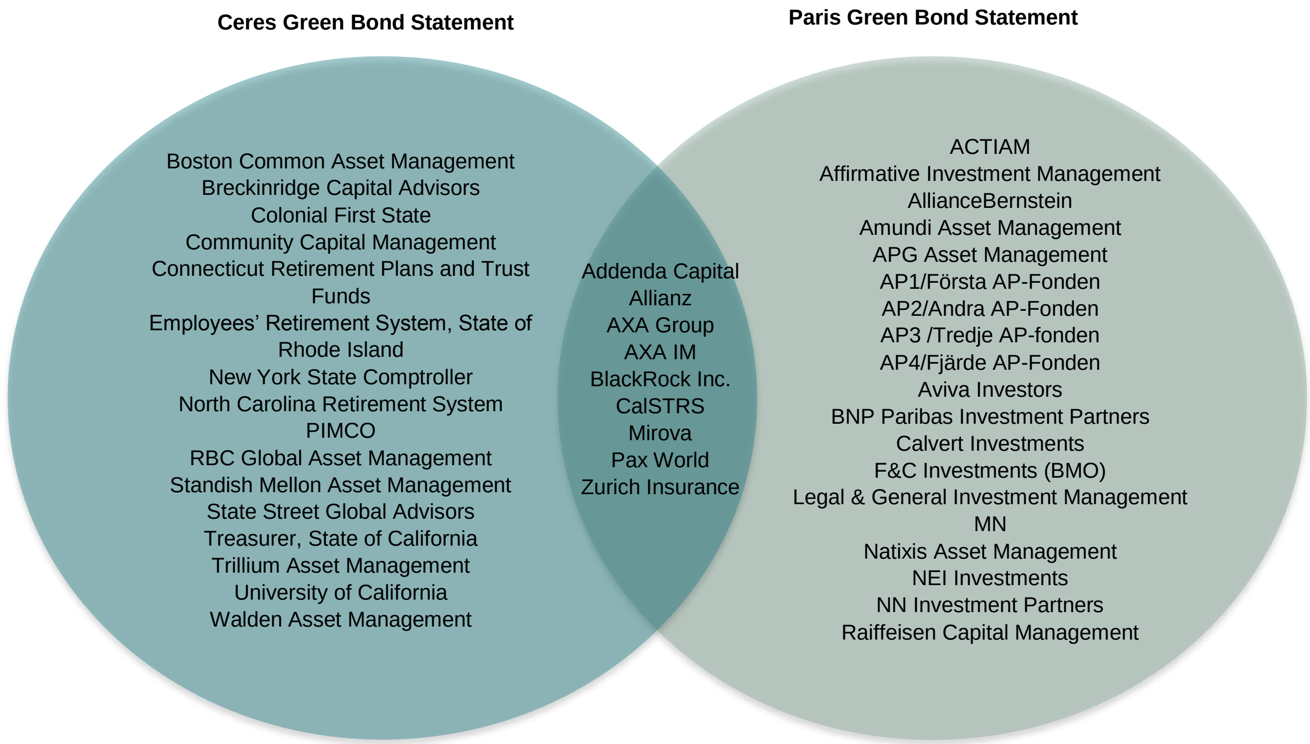
[11] Montreal Carbon Pledge, launched in 2014: http://montrealpledge.org.

[12] Portfolio Decarbonization Coalition, launched in 2015: http://unepfi.org/pdc/about/.

[13] U.N. General Assembly, "Transforming our World: the 2030 Agenda for Sustainable Development," Sept. 25, 2015: http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E.

[14] U.N., "Sustainable Development Goals," 2015: https://sustainabledevelopment.un.org/?menu=1300.

Exhibit 2: Investor Commitments – The CERES Green Bond Statement and the Paris Green Bond Statement



Source: CERES and Paris Green Bond Statements, 2015. Chart is provided for illustrative purposes.

The rationale for engagement regarding sustainability issues goes beyond "doing well by doing good." It is driven by a growing consensus[15] that acting to build sustainability into capital markets will bring significant economic gains, while inaction could lead to economic losses.

A research paper by the Grantham Research Institute on Climate Change and the Environment at the London School of Economics and Political Science (2016) finds that "the expected 'climate value at risk' (climate VaR) of global financial assets today is 1.8% along a business-as-usual emissions path. Taking a representative estimate of global financial assets, this amounts to US$2.5 trillion. However, much of the risk is in the tail" and uncertainties in estimating the climate VaR mean that there is a 1% chance that warming of 2.5°C could threaten USD 24 trillion, or 16.9%, of global financial assets in 2100. The paper also points out that these sums are larger than the estimates of USD 5 trillion for the total stock market capitalization of fossil fuel companies today.[16]

A related industry study by Citigroup (2015)[17] even estimates that cumulative lost GDP from climate change impacts could amount to more than USD 44 trillion on an undiscounted basis.

[15] See e.g. Bank of England/Mark Carney, "Breaking the Tragedy of the Horizon – Climate Change and Financial Stability," Speech at Lloyds of London, Sept. 29, 2015: http://www.bankofengland.co.uk/publications/Documents/speeches/2015/speech844.pdf.

[16] Simon Dietz, Alex Bowen, Charlie Dixon & Philip Gradwell, "Climate Value at Risk of Global Financial Assets," Grantham Research Institute, published by Nature Climate Change, Vol. 6, 676-679 (2016), April 4, 2016: http://www.nature.com/nclimate/journal/v6/n7/full/nclimate2972.html.

[17] Citigroup, "Energy Darwinism II - Why a Low Carbon Future Doesn't Have to Cost the Earth," Report, August 2015: https://ir.citi.com/E8%2B83ZXr1vd%2Fqyim0DizLrUxw2FvuAQ2jOlmkGzr4ffw4YJCK8s0q2W58AkV%2FypGoKD74zHfji8%3D.

Defining "Green" – The Quest for Standardization, Metrics, and Frameworks

The speed and scale at which the green bond market can further develop and mature relies on several variables, including policy and regulatory factors, market conditions, and financing trends.

The speed and scale at which the green bond market can further develop and mature relies on several variables, including policy and regulatory factors, market conditions, and financing trends.[18] It also faces a range of specific challenges and barriers, such as underdeveloped domestic bond markets, issuer views about costs versus benefits, a mismatch between projects, bonds, and institutional investors, as well as a lack of commonly accepted green standards and definitions.[19] Many market participants, in particular investors, see transparency and standards as the central lever for making green bonds a viable long-term instrument for financing sustainable projects.[20]

Since their inception in 2014, the Green Bond Principles (GBPs), a set of voluntary process and reporting guidelines for the use of proceeds of green bonds,[21] have been at the center of the efforts to promote voluntary principles for green finance. These principles aim to provide "more clarity of green finance definitions" to "facilitate cross-border investment in green bonds" and "improve the measurement of green finance activities and their impacts," as outlined in the September 2016 "G20 Communiqué on Green Finance."[22] Over the years, multiple taxonomies in line with the GBPs have been developed, including:

- Second party opinions and third party verification statements;
- The Climate Bonds Standard; and
- Government-backed principles such as the green bond guidelines and the Green Bond Endorsed Project Catalogue published by the People's Bank of China and the Green Finance Committee of China Society of Finance and Banking (2016).[23]

[18] See also OECD/Bloomberg Philanthropies, "Green Bonds – Mobilising the Debt Capital Markets for a Low Carbon Transition," December 2015: https://www.oecd.org/environment/cc/Green%20bonds%20PP%20%5bf3%5d%20%5blr%5d.pdf.

[19] See e.g. G20 Green Finance Study Group, "G20 Green Finance Synthesis Report," Sept. 5, 2016: http://unepinquiry.org/wp-content/uploads/2016/09/Synthesis_Report_Full_EN.pdf.

[20] SÜDWIND e.V. – Institut für Ökonomie und Ökumene, "Green bonds – What is inside the Black Box with the Green Label?" June 2015: http://www.suedwind-institut.de/fileadmin/fuerSuedwind/Publikationen/Publikationen_Englisch/2016-18_Report_Green_Bonds_ENGL.pdf.

[21] ICMA, "Green Bond Principles," launched in April 2014: http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/green-bonds/green-bond-principles/.

[22] G20, "Leaders' Communique Hangzhou Summit 2016," September 2016: https://www.g20.org/Content/DE/_Anlagen/G7_G20/2016-09-04-g20-kommunique-en.html.

[23] Climate Bonds Initiative, "Roadmap for China," Working Paper Series, 2016: https://www.climatebonds.net/files/files/CBI-IISD-Paper1-Final-01C_A4.pdf.

There has been global commitment by market participants, most notably via the "Paris Green Bond Statement" which was signed in December 2015 by 27 investors representing over USD 11.2 trillion of total AUM.

Supported by the Sustainable Stock Exchanges Initiative,[24] as well as issuer and investor demand, the Luxembourg Stock Exchange and London Stock Exchange Group have launched green bond listing requirements and trading models; the Oslo Stock Exchange and Bolsa Mexicana de Valores (BMV) have established dedicated green bond lists; and the Shenzen Stock Exchange and Shanghai Stock Exchange have launched green bond pilot programs. Additionally, the Stockholm Stock Exchange has a list of sustainable bonds that include social impacts.[25]

Defined green eligibility criteria, more disclosure and transparency, and an independent assurance for green bond issuances remain key areas of concern.[26] There has been global commitment by market participants to address these, most notably via the "Paris Green Bond Statement," which was signed in December 2015 by 27 investors representing over USD 11.2 trillion of total AUM.[27]

Recently, the 2 Degrees Investing Initiative, Client Earth, Carbon Tracker, Eurosif, and the World Wildlife Fund announced that they will urge the European Commission to support a speedy development and alignment of green bond standards[28] and metrics—echoing calls by Bank of England Governor Mark Carney (2016)[29] and by investors such as HSBC (2015).[30]

Still, the question about how to define, measure, and benchmark the green investment space remains unclear; hence, the "greenwashing" of projects financed by labeled green bonds could undermine the short-term credibility of the market, and with it, its long-term growth.

[24] Sustainable Stock Exchanges, "United Nations and Stock Exchanges Engage on Green Finance," July 2016: http://www.sseinitiative.org/home-slider/united-nations-and-stock-exchanges-engage-on-green-finance/ (S&P DJI's Martina Macpherson is a member of SSE's Green Finance Working Group).

[25] For more details, see e.g. Climate Bonds Initiative, "China Green Bond Market 2016," January 2017: https://www.climatebonds.net/files/files/SotM-2016-Final-WEB-A4.pdf.

[26] CERES Investor Network on Climate Risk, "A Statement of Investor Expectations for the Green Bond Market," February 2015: https://www.ceres.org/files/investor-files/statement-of-investor-expectations-for-green-bonds.

[27] Climate Bonds Initiative, "The Paris Green Bonds Statement," December 2015: http://www.climatebonds.net/files/files/Paris_Investor_Statement_9Dec15.pdf.

[28] Responsible Investor, "Green Bond Market Roundup," Nov. 1, 2016: https://www.responsible-investor.com/home/article/green_bonds_round_up_november_1_nippon_life_sncf_reseau_mirova/.

[29] Mark Carney, "Resolving the Climate Paradox," Address by Mark Carney BoE Gov & FSB Chair: Arthur Burns Memorial Lecture, Berlin, Sept. 22, 2016: https://www.climatebonds.net/2016/10/%E2%80%9Cresolving-climate-paradox%E2%80%9D-address-mark-carney-boe-gov-fsb-chair-arthur-burns-memorial.

[30] HSBC, "Revitalizing Green Bonds," Nov. 24, 2015: http://www.gbm.hsbc.com/insights/responsible-business/revitalising-green-bonds.

Scaling Up the Green Bond Market – Secondary Market Implications

Many market participants have already committed to invest in green bonds (see Exhibit 2). However, mainstream investors entering the market still face multiple challenges and investment risks, including size, duration, liquidity, and credit. Hence, it is no surprise that green bonds—despite their rapid growth—constituted less than 1.5% of the overall global bond market as of September 2016.[31]

Over the past several years, various investment managers have launched innovative green, ethical, and social bond investment funds.

Over the past several years, various investment managers, such as Rathbones (ethical bond fund), Calvert (green bond fund), Nikko/World Bank (green bond fund), Columbia Threadneedle Investments (social bond fund), and Axa Investment Management (green bond fund), have launched innovative green, ethical, and social bond investment funds.

On the passive side, developments took off in 2014 when several green bond indices were launched to meet the growing demand. Their main aim is to track the financial performance of a portfolio of green bonds against that of regular bonds.

This first generation of international green bond indices includes:

- The Solactive Green Bond Index (launched in March 2014);
- The S&P Green Bond Index (launched in July 2014, discussed further in the next section);
- The Bank of America Merrill Lynch Green Bond Index (launched in October 2014); and
- The Barclays MSCI Green Bond Index Series (launched in November 2014).[32]

As a response to the growth in the green bond market in China (see Exhibit 1), the ChinaBond China GreenBond Index and the ChinaBond China GreenBond Selected Index were launched by CCDC and CECEP (both launched in April 2016).

Broader indices that include bonds not labeled as green have also emerged, such as the ChinaBond Climate-Aligned Bond Index launched by CCDC, CECEP, and the Climate Bonds Initiative (launched in September 2016).[33]

[31] G20 Green Finance Study Group, "G20 Green Finance Synthesis Report," Sept. 5, 2016: http://unepinquiry.org/wp-content/uploads/2016/09/Synthesis_Report_Full_EN.pdf.

[32] For a comprehensive summary on green bond indices launched in 2014 and beyond, see e.g. Bank for International Settlements, "Green Bonds – Certification, Shades of Green and Environmental Risks," Aug. 24, 2016: http://unepinquiry.org/wp-content/uploads/2016/09/12_Green_Bonds_Certification_Shades_of_Green_and_Environmental_Risks.pdf.

[33] See Climate Bonds Initiative, "China Green Bond Market Growth 2016," January 2017: https://www.climatebonds.net/files/files/SotM-2016-Final-WEB-A4.pdf.

A key challenge in constructing a green bond index is setting specific, transparent, and objective rules to identify what market participants generally define as "green" and, therefore, consider part of their investment choice set.

Theory Into Practice: The S&P Green Bond Index and S&P Green Bond Select Index

In 2014, S&P Dow Jones Indices conducted an extensive consultation with experts such as the Climate Bonds Initiative and index stakeholders, including issuers, asset managers, asset owners, and consultants, to solicit feedback on a new green bond index design and methodology, as well as to identify the emerging standards in the definition of green bonds.

In 2014, S&P Dow Jones Indices conducted an extensive consultation with experts to solicit feedback on a new green bond index design and methodology, as well as to identify the emerging standards in the definition of green bonds.

The result was the S&P Green Bond Index, launched in July 2014,[34] which is designed to track the global green bond market. This pioneering strategy is a market-value-weighted index that is designed to provide transparency into the characteristics of the green bond market and independently track and report its performance.

In February 2017, S&P Dow Jones Indices broadened its green bond effort and launched the S&P Green Bond Select Index.[35] The index is a market-value-weighted subindex of the S&P Green Bond Index that seeks to measure the performance of green-labeled bonds issued globally, subject to stringent financial and extra-financial eligibility criteria. The index forms the basis for one of the world's first green bond ETFs.[36]

Both of the indices include bonds that are labeled green by their issuers and independently assessed by the Climate Bonds Initiative (via "CBI Flags"),[37] with an additional filter applied. They are in line with ICMA's Green Bond Principles and track green-labeled, use-of-proceeds bonds, which are used to finance environmentally friendly projects.[38]

[34] S&P Dow Jones Indices, "S&P Green Bond Indices Methodology," March 2017: http://spindices.com/documents/methodologies/methodology-sp-green-bond-indices.pdf.

[35] S&P Dow Jones Indices, "S&P Green Bond Indices Methodology," March 2017: http://spindices.com/documents/methodologies/methodology-sp-green-bond-indices.pdf.

[36] See Van Eck, "VanEck Launches the First U.S.-Listed Green Bond ETF," March 6, 2017: http://www.businesswire.com/news/home/20170306005742/en/VanEck-Launches-U.S.-Listed-Green-Bond-ETF for more details on the new Green Bond ETF.

[37] See Climate Bonds Initiative, "Green Bonds Methodology," December 2016: https://www.climatebonds.net/files/files/Green%20Bond%20Methodology%202017.pdf for more details.

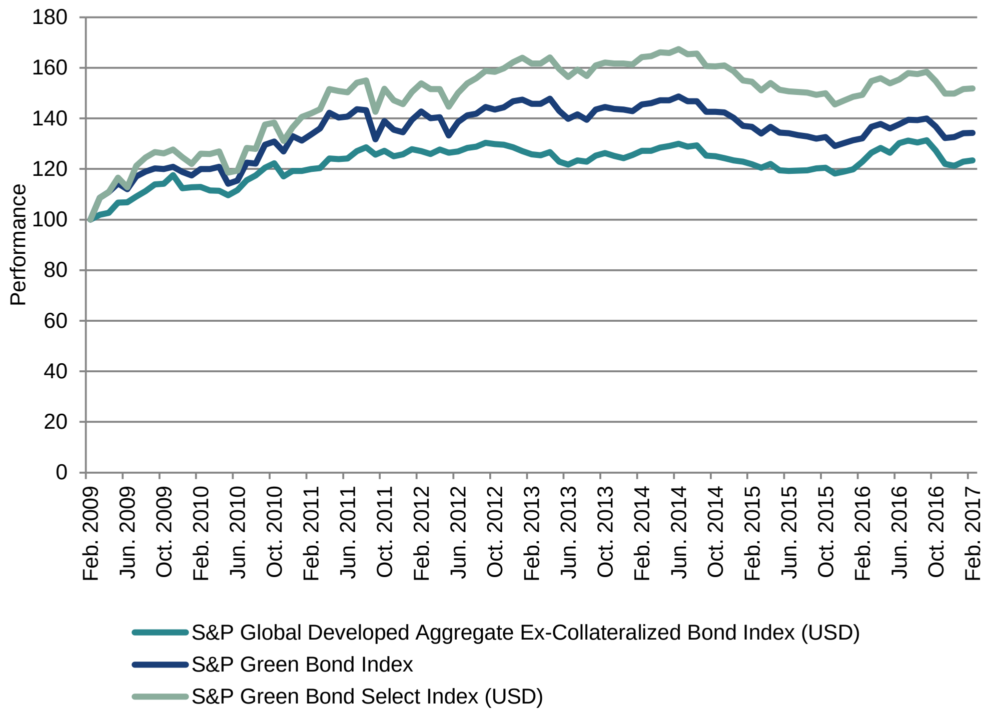
[38] S&P Dow Jones Indices, "S&P Green Bond Indices Methodology," March 2017: http://spindices.com/documents/methodologies/methodology-sp-green-bond-indices.pdf.

The more newly released S&P Green Bond Select Index follows more rigorous guidelines in relation to its financial criteria.

However, the more newly released S&P Green Bond Select Index follows more rigorous guidelines in relation to its financial criteria.

- New issues must be rated by at least one rating agency (S&P Global Ratings, Moody's, or Fitch) to be considered at the next rebalancing.
- In order to enhance liquidity, bonds must exceed certain size requirements based on currency and type of issuer.
- Issuer concentration is capped at 10%.
- The high-yield portion of the index is capped at 20%.
- Additional guidelines related to debt type, maturity, and market of issue also apply.

Exhibit 3: S&P Green Bond Indices – Performance



Source: S&P Dow Jones Indices LLC. Data as of Dec. 31, 2016. Index performance based on total return in USD. Past performance is no guarantee of future results. Chart is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

Exhibit 4: S&P Green Bond Indices – Risk/Return Analysis

CATEGORY	S&P GLOBAL AGGREGATE DEVELOPED EX-COLLATERALIZED BOND INDEX	S&P GREEN BOND INDEX	S&P GREEN BOND SELECT INDEX
ANNUALIZED RETURN (%)			
1-Year	1.93	1.78	1.86
3-Year	-0.80	-2.61	-2.50
5-Year	-0.73	-0.29	0.56
8-Year	1.64	2.08	3.66
ANNUALIZED RISK (%)			
1-Year	7.86	6.12	6.29
3-Year	5.39	5.08	5.24
5-Year	4.87	6.12	6.05
8-Year	5.89	9.07	10.08
TRACKING ERROR (%)			
1-Year	-	3.41	3.62
3-Year	-	2.77	2.86
5-Year	-	4.11	4.06
8-Year	-	6.08	6.81

Source: S&P Dow Jones Indices LLC. Data as of Dec. 31, 2016. Index performance based on total return in USD. Past performance is no guarantee of future results. Table is provided for illustrative purposes and reflects hypothetical historical performance. Please see the Performance Disclosure at the end of this document for more information regarding the inherent limitations associated with back-tested performance.

The potential for scaling up green finance, including green bonds, remains substantial.

ALIGNING INCOME WITH IMPACT – THE ROLE ETFs CAN PLAY

The potential for scaling up green finance, including green bonds, remains substantial, and the launch of green bond indices can be interpreted as a sign of the market's growing maturity. However, real green bond market growth depends on the growth in secondary markets and the availability of investment products that allow easy access to the market, in particular index funds and ETFs.[39]

[39] See e.g. Morgan Stanley, "Fixed Impact: Green Bonds Primer," Feb. 4, 2016: http://www.morganstanley.com/msimage/Fixed-Impact-Green-Bonds-Primer.pdf.

In the past 30 years, ETFs have become key financial market instruments.

- The first ETF was launched in 1990, followed by the launch of the SPDR S&P 500® ETF, the world's largest and most-traded ETF, with USD 212 billion AUM as of March 2017.[40]
- The assets invested in ETFs and other exchange-traded products (ETPs) listed globally reached a record high of USD 3.84 trillion at the end February 2017.[41]
- Global ETF/ETP AUM are projected to hit USD 15.5 trillion by 2024 and will likely be a key contender for marketplace supremacy, alongside mutual funds.[42]
- As of June 2016, USD 855 billion AUM in ETFs were based on indices from S&P DJI.[43]

Although all types of investment products are important in the continued development of the market, the recent launch of ETFs in particular can play an important role in the green bond market's evolution.

In 2016, green bond secondary market growth also gained traction. A handful of actively managed and index tracking open-end funds emerged in Europe, and two actively managed green bond mutual funds were developed in the U.S.

Recently, ETFs have been launched in the primary and secondary markets. Although all types of investment products (actively managed and index based) are important in the continued development of the market, the recent launch of ETFs in particular could play an important role in the green bond market's evolution. The accessibility and tradability of ETFs make them a powerful tool that essentially packages an entire market segment into a single trade.

With ETFs for green bonds, liquidity is key.

- A defining feature of ETFs is their liquidity. This is an appealing feature of fixed income ETFs in particular, which effectively move the over-the-counter nature of bond trading onto a transparent and efficient stock exchange. This feature has become increasing important, as bond-trading desks are holding fewer inventories for market-making purposes as a result of higher capital requirements following the post-financial crisis regulation. For market participants that do not have the ability to efficiently source the underlying bonds, ETFs may provide an effective way to gain exposure to the green bond market.

[40] ETFDB.com, "Largest ETFs: Top 100 ETFs by Assets," March 20, 2017: http://etfdb.com/compare/market-cap/.

[41] ETFGI.com, "ETFGI reports ETFs/ETPs listed globally gathered record inflows of US$68 billion and assets reached a new high of US$3.844 trillion at the end of February 2017," March 9, 2017: http://etfgi.com/news/detail/newsid/1722.

[42] ETF.com, "ETFs' Future: Huge Growth," Feb. 4, 2014: http://www.etf.com/sections/features/21150-the-future-of-etfs-huge-growth.html?nopaging=1.

[43] S&P Global, "Investor Factbook," 2016: http://investor.spglobal.com/Cache/1500092604.PDF?O=PDF&T=&Y=&D=&FID=1500092604&iid=4023623.

- The liquidity of many fixed income ETFs, particularly larger ones, can often be greater than the underlying bonds they hold. In other words, the ETF wrapper provides a layer of secondary market liquidity in addition to what can be found in the primary market.[44] This is because a transaction in an ETF does not necessarily require trades in the underlying bonds. For example, ETF orders between buyers and sellers may be matched on the stock exchange. This additional layer of liquidity may result in lower trading costs, as measured by bid-ask spreads.
- Ultimately, however, liquidity is driven by the fund's underlying holdings, which help create a lower bound on the liquidity of the ETF shares themselves. Therefore, it is important to design indices that emphasize the liquidity of the constituents.

By design, ETFs provide transparency of holdings and pricing, making them well suited for passive investment strategies.

Therefore, index-tracking ETFs make indices investable, allowing market participants to better assess the risk and return of an asset class or market segment.[45]

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This is particularly important for a new market segment such as green bonds, which had previously been limited to higher-cost, actively managed products or those that do not provide the level of transparency or liquidity desired.

Furthermore, unlike other fund structures that may only be offered to a certain type of market participant in limited markets or with varying fee levels, ETFs provide lower-cost access that is available to all types of market participants, from individual investors to larger institutions.

Secondary Market Growth – Introducing the First U.S.-Listed Green Bond ETF[46]

- In 2017, VanEck launched an ETF based on the S&P Green Bond Select Index,[47] which focuses on the most liquid and tradable segment of the green bond market.
- In addition to only including bonds that have daily pricing available, the index applies additional screens. For example, smaller bond

[44] See Martin Lettau, Haas School of Business University of California at Berkeley and Ananth Madhavan, BlackRock, "ETF 101 for Economists," 2016: http://faculty.haas.berkeley.edu/lettau/papers/ETF.pdf.

[45] See KPMG, "ETF Playbook," 2016: https://assets.kpmg.com/content/dam/kpmg/ie/pdf/2016/12/ie-etf-playbook-dec-2016.pdf for details.

[46] VanEck, "VanEck launches the first U.S.-listed Green Bond ETF," March 6, 2017: https://www.vaneck.com/vaneck-launches-first-us-listed-green-bond-etf-march-6-2017.pdf.

[47] S&P Dow Jones Indices, "S&P Green Bond Indices Methodology," March 2017: http://spindices.com/documents/methodologies/methodology-sp-green-bond-indices.pdf.

issues are not included, and certain types of debt for which there is little or no secondary market activity are excluded.

- To be eligible for inclusion, all bonds must also be rated by at least one rating agency, and be generally accessible to global market participants.

Last but not least, it is important to note that the global green bond market, as represented by the S&P Green Bond Select Index, has many characteristics that are similar to the global core bond market, as represented by an index such as the S&P Global Developed Aggregate ex-Collateralized Bond Index.[48] As a result, green bonds may fit within a global core fixed income allocation without significantly affecting the risk/return profile.

CONCLUSION

By using passive green bond investment instruments, fixed income market participants are now able to meet their investment objectives—while still making a positive green impact.

Over the past few years, significant progress has been made in establishing and aligning green bond principles and taxonomies. As the market progresses toward a common standard, having an investable index and liquid, tradeable ETPs that provide efficient access to green bonds is another step in the evolution of the market, scaling up green finance, and mainstreaming environmental, social, and governance (ESG) investing.

Together, increased standardization, commitment, and access will help provide the next leg of growth for the green bond market, which could play an important role in meeting the world's climate goals. By using passive green bond investment instruments, fixed income market participants can be well positioned to meet their investment objectives—while still making a positive, green impact.

[48] S&P Dow Jones Indices, "S&P Global Bond Indices Methodology," February 2017: http://spindices.com/documents/methodologies/methodology-sp-global-bond-indices.pdf.

PERFORMANCE DISCLOSURE

The S&P Green Bond Index was launched July 31, 2014. The S&P Green Bond Select Index was launched on February 17, 2017. The S&P Global Developed Aggregate ex-Collateralized Bond Index was launched on July 5, 2016. All information presented prior to an index's Launch Date is hypothetical (back-tested), not actual performance. The back-test calculations are based on the same methodology that was in effect on the index Launch Date. Complete index methodology details are available at www.spdji.com.

S&P Dow Jones Indices defines various dates to assist our clients in providing transparency. The First Value Date is the first day for which there is a calculated value (either live or back-tested) for a given index. The Base Date is the date at which the Index is set at a fixed value for calculation purposes. The Launch Date designates the date upon which the values of an index are first considered live: index values provided for any date or time period prior to the index's Launch Date are considered back-tested. S&P Dow Jones Indices defines the Launch Date as the date by which the values of an index are known to have been released to the public, for example via the company's public website or its datafeed to external parties. For Dow Jones-branded indices introduced prior to May 31, 2013, the Launch Date (which prior to May 31, 2013, was termed "Date of introduction") is set at a date upon which no further changes were permitted to be made to the index methodology, but that may have been prior to the Index's public release date.

Past performance of the Index is not an indication of future results. Prospective application of the methodology used to construct the Index may not result in performance commensurate with the back-test returns shown. The back-test period does not necessarily correspond to the entire available history of the Index. Please refer to the methodology paper for the Index, available at www.spdji.com for more details about the index, including the manner in which it is rebalanced, the timing of such rebalancing, criteria for additions and deletions, as well as all index calculations.

Another limitation of using back-tested information is that the back-tested calculation is generally prepared with the benefit of hindsight. Back-tested information reflects the application of the index methodology and selection of index constituents in hindsight. No hypothetical record can completely account for the impact of financial risk in actual trading. For example, there are numerous factors related to the equities, fixed income, or commodities markets in general which cannot be, and have not been accounted for in the preparation of the index information set forth, all of which can affect actual performance.

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GENERAL DISCLAIMER

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