The Effectiveness of Policy Support in Promoting Green Bonds: Empirical Evidence

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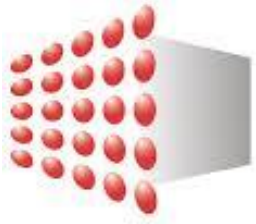

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What are Green Bonds?

Green bonds are fixed income instruments used to fund projects that have positive environmental and/or climate benefits.

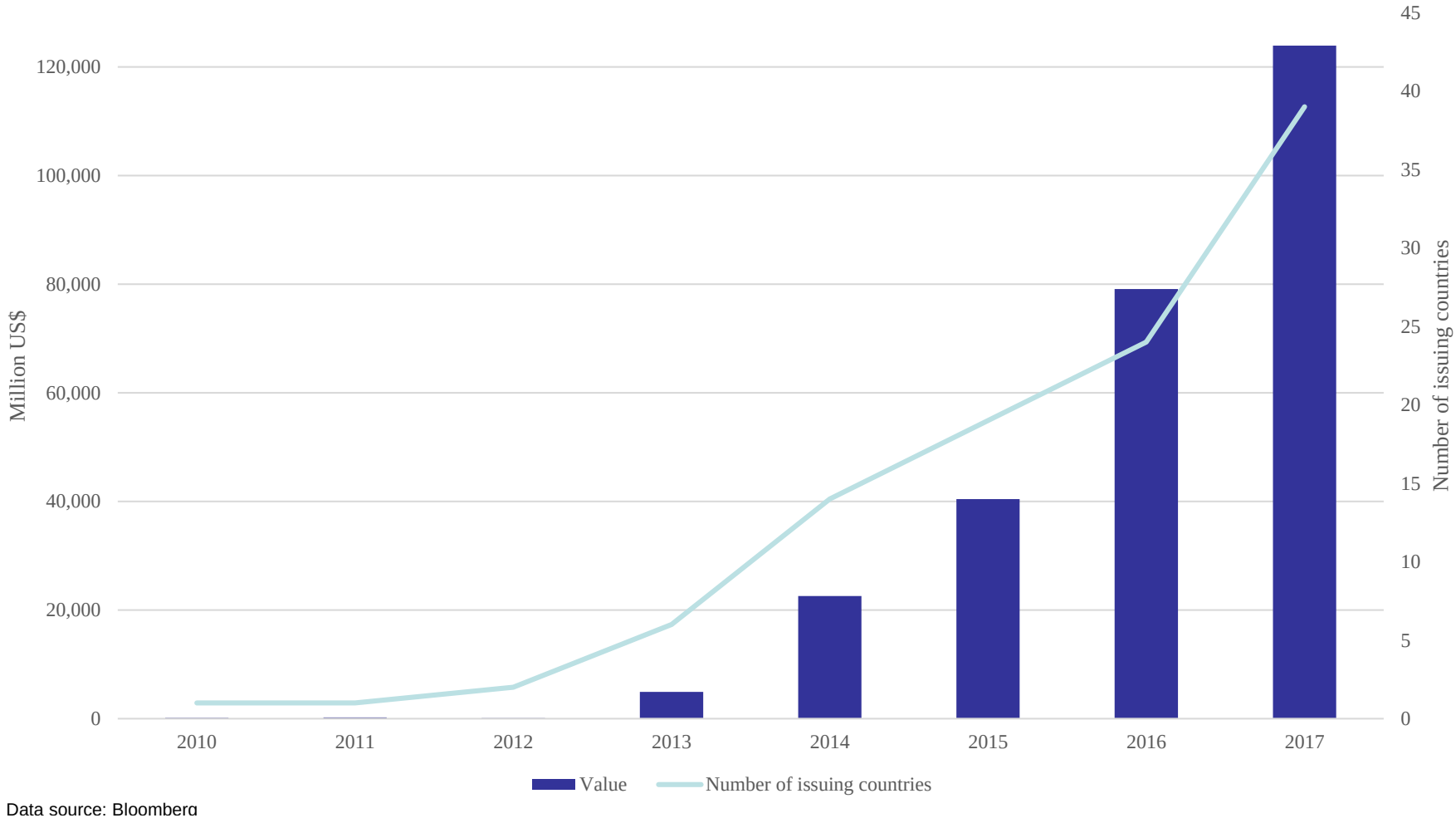
The issuer commits to use proceeds only for Green Projects with clear environmental benefits.

Labelling provides a guarantee that proceeds will be used only to fund Green Projects.

Green Projects

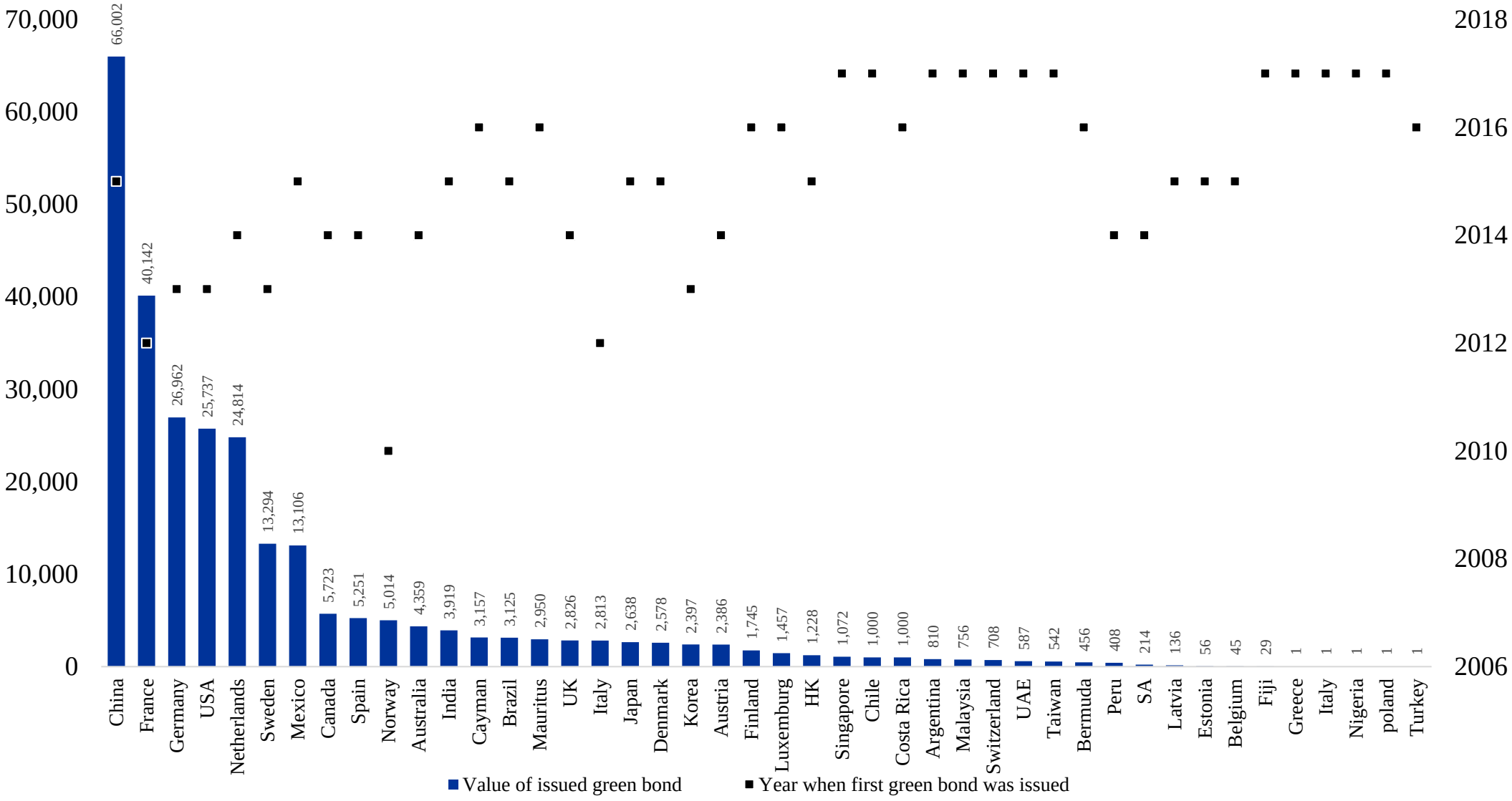
1. **renewable energy**
2. **energy efficiency**
3. **pollution prevention and control**
4. **environmentally sustainable management of living natural resources and land use**
5. **terrestrial and aquatic biodiversity conservation**
6. **clean transportation**
7. **sustainable water and wastewater management**
8. **climate change adaptation**
9. **eco-efficient and/or circular economy adapted products, production technologies and processes**
10. **green buildings**

Fast growth of green bond market.
The global green bond market grew from $3 billion in 2012 to more than $100 billion in 2017.



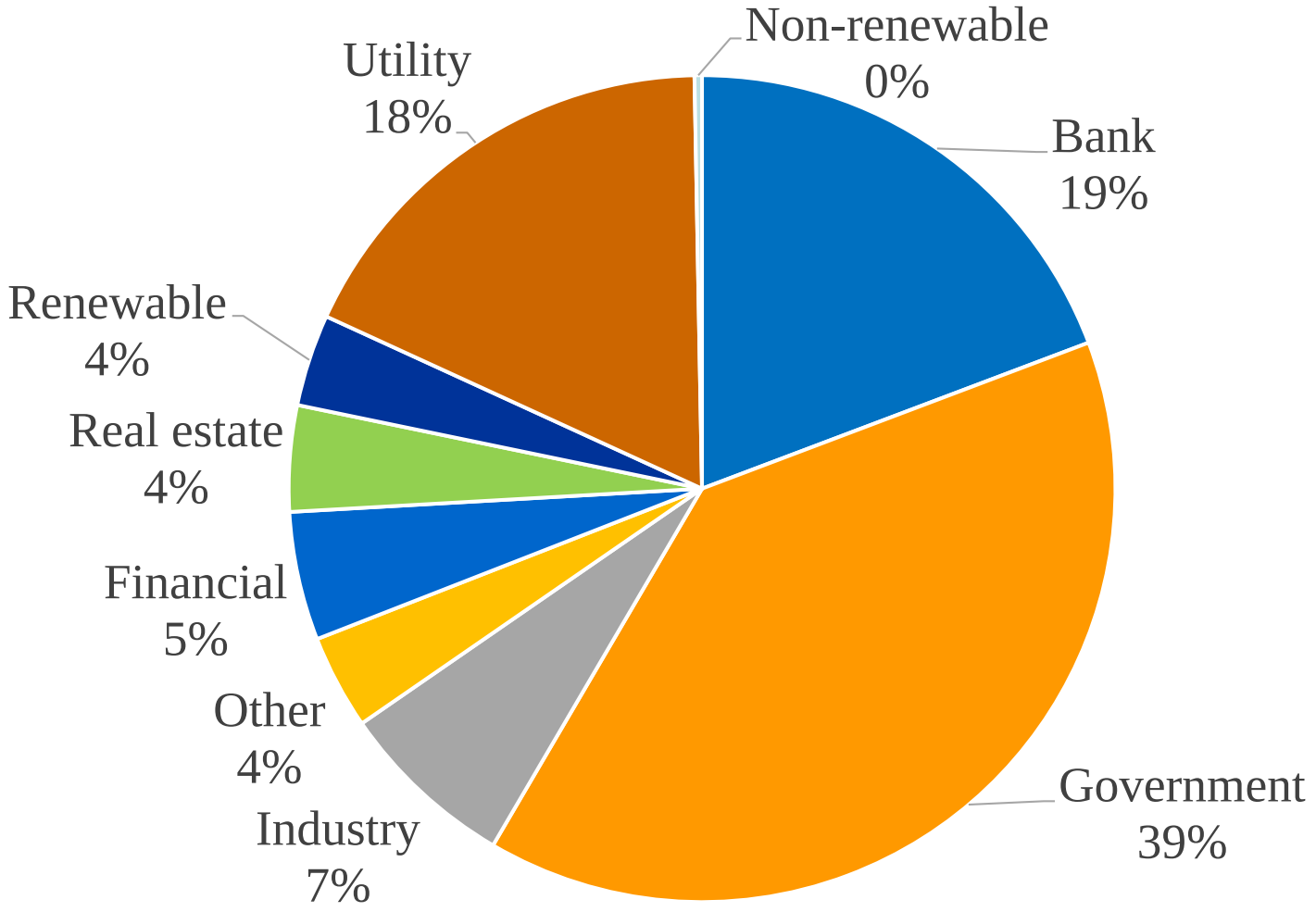
Data source: Bloomberg

Largest value of green bonds were issued in China



Data source: Bloomberg (2018)

Major sectors issuing green bonds are the government, financial sector and utilities



Data source: Bloomberg (2018)

Policies supporting green bonds

1. Green bond **guidelines**
2. **Public** issuance of green bonds to
3. Green Bond **Grant**
4. **Real sector** policy support (Loans, Feed-in tariffs, Market-based instruments etc.)

1. Green Bond Guidelines (GBG)

GBG encourage more transparency and standardisation to bring more credibility and to hence promote green bonds.

Countries either accept International Green Bond Standards or set their own national green bond standards (usually based on International Green Bond Standards):

- International Capital market Association's (ICMA) Green Bond Principles (GBP)
- Climate Bond Initiative's Climate Bonds Standards
- ASEAN Capital Market Forum's ASEAN Green Bonds Standards

The Green Bond Principles

ICMA

Green Bond Principles

Voluntary Process Guidelines for Issuing Green Bonds

ASEAN Capital Markets Forum

ASEAN Green Bond Standards

Climate Bonds Initiative

Assurance/Integrity/ Transparency

For Climate Bonds and Green Bonds

2. Public issuance of green bonds

Public issuance of green bonds by city municipals, development banks and governments with objective to:

- Provide initial market product pipelines and liquidity
- Engage investors and educating them about green bonds

Source: Climate Bond initiative, Green Bond Policy Areas https://www.climatebonds.net/policy/policy-areas

3. Green Bond Grant

- The grant covers the **cost of external review** in order to label it ‘green’ following specified standards national or international.
- Usually covers 90-100% of cost with a maximum cap.
- Examples: Singapore, Malaysia, Hong-Kong and Japan.

Climate Bonds INITIATIVE

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Hot off the press: Singapore’s central bank announces Green Bond Grant scheme to cover any additional issuance costs of going green – what a way to kick-start the market!

Multi-level data structure

48 Countries

China, France, Germany, USA, Netherlands, Sweden, Mexico, Canada, Spain, Norway, Australia, India, Cayman, Brazil, Mauritius, UK, Italy, Japan, Denmark, Republic of Korea, Austria, Finland, Luxemburg, Hong Kong, Singapore, Chile, Costa Rica, Argentina, Malaysia, Switzerland, UAE, Taiwan, Bermuda, Peru, Saudi Arabia, Latvia, Estonia, Belgium, Fiji, Greece, Italy, Nigeria, Poland, Turkey

7 Sectors

- Utilities
- Renewable
- Fuel
- Real estates
- Financial
- Banks
- Industry

60 Periods

- Jan-Dec 2013
- Jan-Dec 2014
- Jan-Dec 2015
- Jan-Dec 2016
- Jan-Dec 2017

Model

Random intercept and random coefficient (slope) model:

$$y_{ijt} = \mu_j + \sum \alpha_{kj} x_{ijt} + \beta_j v_{it} + \gamma_j z_{it} + \delta_j w_t + \varepsilon_{ijt}$$

where $j = 1, \ldots, 48$ indexes the cross-sectional unit (country), $i = 1, \ldots, 7$ indexes sectors and $t = \text{Jan } 2013, \ldots, \text{Dec } 2017$ indexes period. y_{ijt} is a country-level, sector-level, and time related dependent variable (green bond issuance), x_{ijt} is country-level, sector-level and time-related independent variables (all bonds issuance), v_{jt} is a country-level and time-related independent variable (sovereign bond issuance, FiT, loan, MBI and green bond policy), z_{it} is a sector-level and time-related independent variable, w_t is a time-related independent variable (price of renewable energy sources). In the random intercept model μ_j and ε_{ijt} are independently distributed with $\mu_j \sim N(0, w^2)$ and $\varepsilon_{ijt} \sim N(0, \sigma^2)$.

Variables

Variable	Description	Level
Green Bonds	Dollar value of green bond issuance over the dollar value of all bonds issuance	Country; Period; Industry
All Bonds	Dollar value of all bonds issuance over the dollar value of all bonds issuance	Country; Period; Industry
Sovereign Green Bonds	Dollar value of green bonds issuance by sovereigns over the dollar value of all bonds issuance	Country; Period; Industry
Green Bond Policy	Binary variable, equals one if policy supporting green bonds exists and zero otherwise	Country; Period
FiT *Loan* *MBI*	Binary variable, equals one if policy supporting renewable energy exists and zero otherwise	Country; Period
CO2	CO2 emissions, kilograms per 2011 PPP US$ of GDP	Country; Period
LCOE	Global average US$ per kWh	Years

Preliminary Results

Dependent variable: Green bonds	Random Intercept and Random Coefficient on all bonds by country
All bonds issued	0.01** (0.00)
CO2 emissions	0.37 (0.69)
Feed-in tariffs and premiums	0.04 (0.13)
Loans	-0.10 (0.26)
Market-based Instruments	-0.26 (0.20)
Green Bond Principles	-0.03 (0.03)
Sovereign Green Bonds	-0.02 (0.05)
Constant	0.53 (0.38)

Key points

- *Variation in green bond issuance across countries and sectors*
- *Governments try to promote Green Bonds using policy support*
- *Experience in issuing generic bonds is important for issuing green bonds*
  - *Increase of all bond issuance by US$1000 leads to an increase in green bond issuance by US$9*
- *Policies should assist in reducing costs and risks of green bond issuance, especially for first-time issuers and specific sectors less experienced in bond issuance*