Special Issue “PMI e accesso a forme alternative di finanziamento”

TITLE.[1] Sustainable debt instruments: green bonds and beyond

Abstract
Sustainable debt instruments play an increasingly important role in scaling up financing of private investment for the low carbon transition and the other ambitious environmental and social goals set at the EU and global level. Having already emerged as the star of climate finance, green bonds are becoming increasingly popular as companies need to fund operations that are more environmentally friendly in the context of a sustainable recovery from the coronavirus crisis. After an overview of the literature on this new asset class, the paper highlights that reporting on the use of proceeds is considered a crucial element for the success of green bond markets, as it provides investors with an unprecedented degree of transparency. Finally, the paper provides some evidence on the Italian green bond market in the European context.

JEL G10 Q50, Q51
*Keywords*: Green bonds, climate change, sustainable finance, reporting

## Introduction

It is now widely recognized that finance can give a substantial contribution to tackling global challenges, such as climate change and the need for a sustainable recovery after the Covid-19 pandemic. Accordingly, the range of available sustainable debt instruments is expanding at an unprecedented pace. Capital markets in particular can play an essential role in scaling up the financing of investments that provide environmental and social benefits. Green, social and sustainability bonds are notable examples of such new class of financial instruments, which reflect issuer-level sustainability commitments aligned with specific market-based voluntary guidelines.

These financial instruments are legally not different from conventional fixed income security except for the fact that the issuer pledges to use the proceeds for specific kinds of investment, e.g. for projects having positive environmental impact in the case of green bonds, or for investments with positive social outcomes in the case of social bonds. Against this background, with European issuances leading the way, to date green bonds have the lion’s share of sustainable debt markets, representing 4% of total global bond issuance in 2021, or EUR 171 billion, up from just EUR 6.5 bn in 2013 (Climate Bond Initiative, 2021). They are the focus of this article.

Market growth in Europe is likely to gain momentum spurred by important policy initiatives, notably the proposal for an EU green bond standard (EU-GBS) put forward by the European Commission in July 2021. Based on and improving upon best market practices, the EU-GBS envisages binding requirements, in particular the alignment with the EU Taxonomy of sustainable activities, and standardized procedures to enhance transparency and disclosure. These factors have been identified as important determinants of the success of the green bond market. The focus on green use of proceeds, tracking, impact reporting and external reviews that uniquely characterizes green bonds grants a degree of transparency unmatched in traditional bond markets, driven instead by overall company and credit metrics (see Fatica (2020) for a discussion). Against this backdrop, the EU-GBS minimizes the risk of greenwashing that might still act as a brake against the full development of this debt instrument, and thus paves the way for a more widespread use of

green bonds in corporate finance, as firms become increasingly concerned about the environmental sustainability of their operations.
The paper provides an overview of the development of green bonds. Section 1 reviews the small but growing literature in the field. Section 2 focuses on the use-of-proceeds reporting, as a characterising feature of green bond practices that provides information on the associated investment projects. Section 3 describes the Italian green bond market in the broader EU context. Section 4 concludes.

## 1. What we know about green bonds

The literature on green bonds is still limited but growing at a fast pace. While investor demand for green securities is significantly in excess of available supply, academic interest has primarily focused on how financial markets price these bonds compared to similar conventional fixed income instruments. In particular, the question is whether there is a premium ('greenium'), i.e. an additional spread paid by green bonds compared to equivalent conventional bonds. The evidence on the existence and the direction of a 'greenium' is mixed. The divergence in the findings can be partly reconciled by differences in the samples used for the analysis, in both the cross-sectional and the time series dimensions, as well as methodological choices, notably whether the comparison between green and conventional securities is performed after a matching approach (Dorfleitner, Utz, and Zhang, 2021). Zerbib (2019) finds a moderate negative premium in favour of green securities issued between July 2013 and December 2017, with a more pronounced gap for financial and low-rated bonds. Still focusing on secondary markets, Karpf and Mandel (2018) document instead a green bond discount for US municipal bonds. After factoring in tax provisions, Baker et al. (2018) find the opposite result in the primary market, notably that green municipal bonds at issue pay a slightly lower after-tax yield than that paid by otherwise equivalent bonds. By contrast, Larcker and Watts (2019) do not find evidence of a price difference. The absence of a significant yield differential between green and conventional bonds in more recent periods is confirmed by Ma et al. (2020), who also show that green securities display a markedly lower volatility during episodes of high market stress such as the COVID-19 outbreak.

This is consistent with sustained and stable demand by institutional investors, particularly sustainability-oriented mutual funds (Fatica and Panzica, 2021). Fatica, Panzica and Rancan (2021) suggest that the lack of consensus on the ‘greenium’ may depend on heterogeneity across types of issuers. Their findings point to a negative yield premium for green bonds issued by supranational institutions and non-financial corporates, but not for green securities issued by financial institutions. The latter might indeed find it more difficult to signal their environmental attitude to the market, since the bond funding is arguably used to finance green loans, rather than directly investment projects in ‘green’ fixed capital.

The difficulties for investors to disentangle issuers with a genuine commitment to environmentally friendly projects from those engaging in mere ‘greenwashing’ is consistent with the fact that green bond label per se is not enough to raise funding at a lower cost. This argument is corroborated by the finding that, when a negative greenium exists, it is larger for bonds with external review and for those issued by return issuers, i.e. issuers that tap the green bond market more than once. Indeed, if external review acts as a signalling device for bonds that actually have environmental or climate-related benefits, expectedly reviewed bonds sell at a premium compared not only to conventional bonds but also to non-reviewed green securities. In a similar vein, Bachelet, Becchetti and Manfredonia (2019) find that, in comparison with their conventional counterparts, green bonds from institutional issuers enjoy a more favourable treatment on the market, in terms of pricing and volatility, than green bonds from private issuers without certification.

In addition to external verification and institutional reputation, issuers can reduce information asymmetries simply by borrowing. Specifically, repeat green bond issuances over time are, indirectly, a signal of environmental commitment. Also, multiple issuances allow investors gather more information on the borrowers and monitor their environmental action.

The fact that some green bonds pay a lower yield compared to similar conventional bonds implies a lower cost of financing on green issuances, all other things being equal. The negative premium is an incentive to issue green bonds because green issuers can obtain funds with a lower cost of debt but entails the risk of companies engaging in greenwashing to attract sustainability-concerned investors. It is not clear to what extent the risk is mitigated

by the additional costs that green issuers incur, e.g. for reporting or external review.

The importance of the greenness of the bond has far-reaching consequences. Recent survey evidence reported in Sangiorgi and Schopohl (2021) documents that strong green credentials are the most relevant factor for European institutional investors' decision to invest in green bonds. At the same time, unclear and poor reporting on the actual allocation of proceeds to green projects prevents investors from buying or leads them to sell a green bond already included in their portfolios. Ultimately, this suggests that green bonds can indeed play a stabilizing role on debt markets, with significant implications for overall financial stability.

Another important strand of the literature looks at the impacts of green bonds on issuer performance. On the financial side, Flammer (2019) and Tang and Zhang (2020) find a positive stock market reaction to the issuance of green bonds. On the real side, the implications and effectiveness of green bonds have been investigated looking at issuers' environmental performance. Since detailed information on the environmental impact of the investment project for which the bond proceeds are earmarked is seldom disclosed on a regular basis, available studies resort to company level information (Ehlers et al., 2020; Mazzacurati et al., 2021). In this vein, Fatica and Panzica (2021), using matched bond-issuer data, test whether green bond issues by non-financial corporations are associated with a reduction in firm-level carbon emissions, relative to total assets. They find that, compared to conventional bond issuers with similar financial characteristics and environmental ratings, green issuers display a decrease in the carbon intensity of their assets after borrowing on the green bond market. Remarkably, the decrease in emissions is more pronounced and significant when the analysis excludes green bonds issued for refinancing existing projects. This is consistent with an increase in the volume of climate friendly activities due to new investment projects financed with green bonds. Moreover, the study finds a larger reduction in emissions for green bonds that have external review, suggesting that the willingness to incur the costs of external review is a strong signal of companies' commitment towards the environment. As such, the evidence is not consistent with the 'greenwashing' argument, and points to an important signalling effect of green securities, in the light of compelling evidence that environmental and

climate risk is increasingly being priced by equity markets (Bolton and Kacperczyk, 2021).

## 2. Green bonds and reporting on the use of proceeds

As suggested also by the literature reviewed in section 1, disclosure of relevant information to the market has been identified as one of the reasons for the increasing popularity of green bonds (Financial Times, 2019). Specifically, transparency on the use of proceeds is of paramount importance in the market for green securities. Most market guidelines require that use of proceeds reporting is disclosed at least annually after issuance (Climate Bond Initiative, 2018). Some issuers also engage in impact reporting, i.e. reporting on the ultimate environmental effect of the project financed with the green issuance. While not mandatory in any market-based guidelines so far, impact reporting is however considered as a best practice, as it strengthens market accountability. In general, reporting varies widely across issuers both in content and format, making it difficult to compare and evaluate reporting across issuers or sector. In this section, we investigate reporting on the use of proceeds for a large sample of green bonds issued worldwide up to 2021. To overcome the comparability issues that arise due to heterogeneous market reporting practices, we focus on information at issuance available from financial data providers, which has therefore being subject to minimal harmonization. In particular, we retrieve the information on the use of proceeds applying text mining techniques to the 'tranche note' that accompanies each bond tranche. [1]

### Bond information and allocation

We first analyse the classification on the bond information and allocation (see Table 1). So-called pure-play bonds financing general corporate purposes are the sheer majority of green bonds issued by non-financial

[1] Our data source is DCM Dealogic. Out of 2,182 green bonds issued by non-financial corporations that are under analysis, roughly 18% do not disclose any information on the use of proceeds. To have a comprehensive picture of the type of information available for green bonds, we perform the analysis on bonds issued both in the EU and extra-EU.

corporations in the sample period, within an outside Europe.[2] Pure-play bonds are around one-third of green bonds issued (almost 90% in the EU). In terms of amount, pure-play bonds are 65% of the market (84% if only EU issuers are considered). Refinancing is the second largest clearly identified specific category for bond allocation. Almost 21% of funds raised in the green bond market are used to refinance existing projects, rather than to finance new projects.

**Table 1. Bond information and allocation – Number of contracts and amount**

| | Non Financial | | Total Market | |
|---|---|---|---|---|
| | Contracts | Amount Bn (€) | Contracts | Amount Bn (€) |
| **Non Eu-Issuer** | **1679** | **311.04** | **3081** | **558.13** |
| General Corporate Purposes | 821 | 166.34 | | |
| Securitisation | 42 | 8.83 | | |
| Refinancing | 461 | 92.74 | | |
| Others | 355 | 43.12 | | |
| **Eu-issuer** | **503** | **192.93** | **974** | **497.68** |
| General Corporate Purposes | 447 | 162.13 | | |
| Securitisation | 1 | 0.35 | | |
| Refinancing | 23 | 12.93 | | |
| Others | 32 | 17.53 | | |
| **Total** | **2182** | **503.97** | **4055** | **1055.82** |

Source: elaborations on DCM Dealogic.

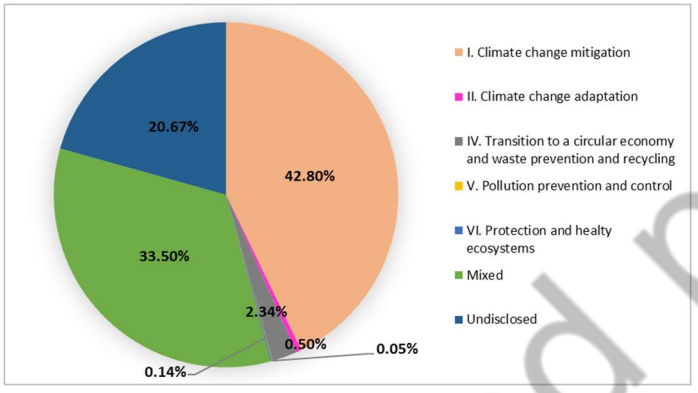
## Category-level information

Category-level reporting provides more granular information on the types of projects that the proceeds of the green bonds are financing. This information is available at the level of the bond tranches. We analyse the project-level information provided, and map it to broad categories that are indicative of

[2] Green bonds may be issued by pure-play 'green' companies, such as manufacturers of solar panels or electric cars, for general corporate purposes, with the rationale that all activities of the company are green. There is a debate as to whether bonds issued by such companies are automatically green, as they could be used to finance non-green activities such as a dividend payment or share repurchase. At any rate, pure-play bonds do not have any separate green bond reporting on top of the general sustainability reporting

the classification adopted in the EU taxonomy for green activities. In **Figure 1** we report the allocation of proceeds to projects classified according to the categories linked to the different environmental objectives. For the analysis from this point on, we focus on green bonds issued by non-financial firms.

**Contracts**




**Amounts**

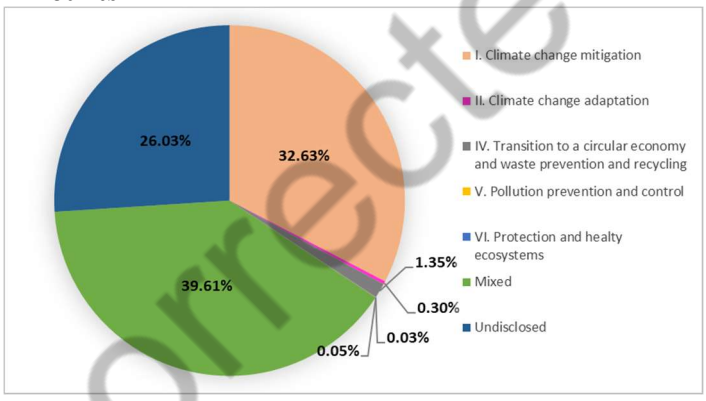



**Figure 1** Allocation of proceed to project categories
Source: JRC elaborations on DCM Dealogic.

Around 74% of all bonds have category or project-level information available. However, a large share of reporting green bonds (33% in terms of contracts, almost 40% in terms of amount) falls in what we define as a ‘mixed’ category. Proceeds from these bonds are used for multiple projects, and we are not able to classify them because we do not have information on the shares allocated to the different projects.

Looking at the more granular information on the specific of investment projects, one can get a sense of what types of fixed capital and technologies green bonds are financing. This is a distinctive feature of green bonds compared to conventional securities, most likely driven by the need to provide green-minded investors with adequate information for them to minimize concerns about greenwashing.

Among single-project bonds, the majority of proceeds have been directed to renewable energy projects (around 25%) with energy efficiency projects also accounting for a large proportion (20% of contracts, 10% of amounts). As well as allocation to broad projects, for some project types, some issuers disclose other useful summary information such as how proceeds were distributed across different countries or regions or technology types (e.g. wind and solar). Not surprisingly, among non-financial corporations, utility and energy companies issue the lion’s share of green fixed income securities, in terms of both number of contracts and amounts. Real estate, construction/building and transportation industries are also big players in the market.

**Has reporting improved over time?**

Transparency granted by complete reporting is considered an essential feature for the green bond market to reach its full potential. One would expect that more widespread and better reporting is both a cause and a consequence of market development. To shed light on how reporting at issuance has evolved over time, in Figure 2 and Figure 3 we plot the share of reporting and non-reporting bonds, in number of contracts and amounts, respectively, broken down by the domicile of non-financial issuers, for each year in the period

2014-2021[3]. Expectedly, the share of reporting bonds increases over time. More than 90% of issued amounts are accompanied by information on the use of proceeds from 2016 to 2019, the positive trends reversed after the 2020. This picture is strikingly different from that for the first part of the period, when not disclosing information on the projects was the most common practice. Among EU non-financial issuers, only 20% of green bond contracts issued in 2014 was disclosing information on the use of proceeds. In the same year, only the 25% of the contracts from extra-EU non-financial issuers reported information.

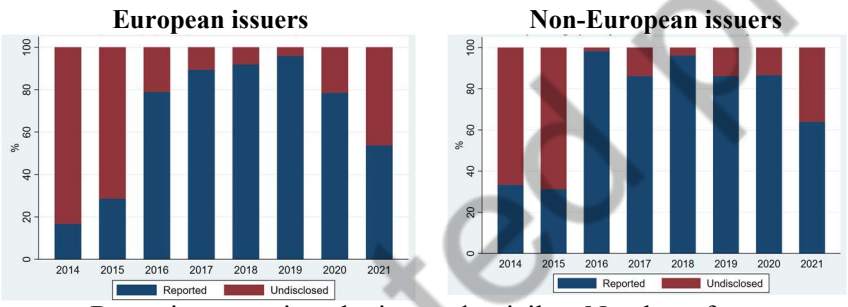



**Figure 2** Reporting over time, by issuer domicile – Number of contracts
Source: JRC elaborations on DCM Dealogic.

[3] Since before of 2014 the green bonds market is at embryonic stage, we do not report these years on the figure.

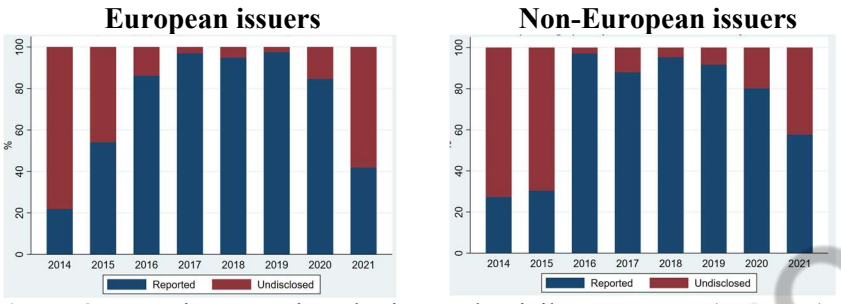



**Figure 3** Reporting over time, by issuer domicile - Amounts (EUR Bn)
Source: JRC elaborations on DCM Dealogic.

## 3. Green bonds: Italy in the EU context

Europe has become a world leader in the issuance of green bonds. As of end 2021, the volumes issued by companies and national and sub-national governments in the EU27 reached EUR 497 bn. As a comparison, bond volumes of non-European issuers are around EUR 558 bn. Among European issuers, non-financial corporations have issued roughly EUR193 bn (39% of the total), while financial institutions and governmental issuers EUR186 bn and EUR 119 bn, respectively.

While the sheer majority of EU countries are active on the green bond market, issuances are concentrated in a few major economies: the six largest national markets account for 84% of the EU27 market. The size of national green markets reflects the size of the economies but also the overall development of debt capital markets. When we consider only non-financial issuers, the Italian market for green bonds is the fifth largest in the EU27 (Figure 4). Italian firms have issued EUR 17.9 bn, or 9.3% of the overall volumes issued by non-financial corporations in the EU. Green bonds account for roughly 1.0% of the Italian overall bond issuance, a ratio below the EU average (1.9%). Volumes issued by French issuers, the most active players in the EU, have reached EUR 65 bn so far, or 33.7% of the continental market. Together with Germany, France is in the lead among EU27 countries also in the issuance of conventional bonds.

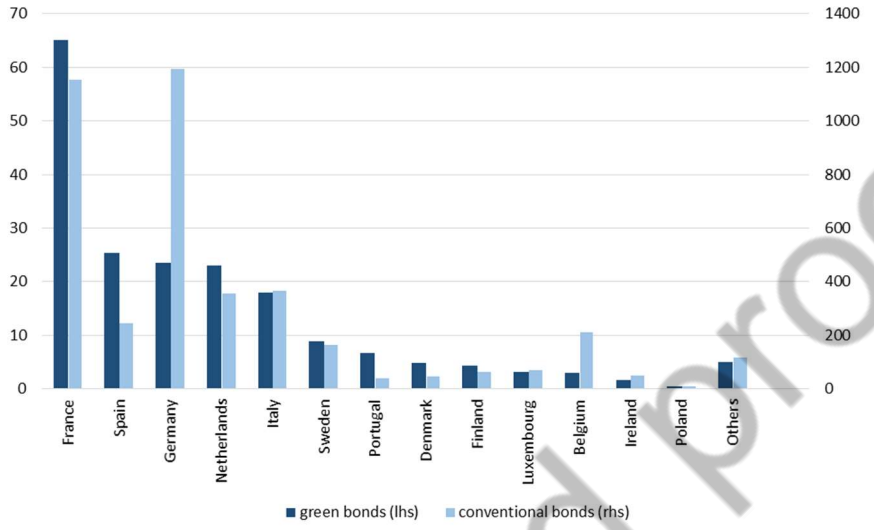



**Figure 4** Green bond issuances by non-financial companies in the EU27, breakdown by Member State (EUR bn)
**Source:** Dealogic DCM.

A promising debt instrument to finance the green transition, green bonds so far have mostly been issued by large companies (including in the financial sector), and governmental bodies. While access to capital markets is pivotal for the firm growth, as also acknowledged in the Capital markets Union Action Plan by the European Commission, it is still to be assessed how easily the green segment can be accessed by small and medium-sized enterprises (SMEs). There is a broader issue of preparedness and adequacy of SMEs to follow more stringent reporting practices also on non-financial issues. In the EU, the forthcoming Green Bond Standard requires that the financed green investments follow the EU taxonomy criteria, in addition the standard creates requirements for issuers to publish a Green Bond Framework, allocation and impact reporting and verification. In turns, the EU taxonomy raises the sustainability disclosure requirements for large public-interest companies, but only as from 2026 for SMEs.

In Italy, the use of green bond finance by SMEs has to be considered also in relation to other debt instruments that have been designed ad hoc for this category of firms, notably the so-called minibond. As a simplified way to access non-bank debt finance, this instrument can serve the additional purpose of familiarizing SMEs with the procedures and requirements of the debt capital market, thus paving the way to the use of other securities, such as green bonds.

## 4. Conclusions

The transition to a sustainable global economy require scaling up the financing of investments that provide environmental and social benefits. Sustainable debt instruments can play an essential role in redirecting finance towards the ambitious environmental and climate goals set out at the EU and global levels. In this article, we shed light on green bonds, so far undoubtedly considered the star of climate finance. Through their focus on project-level information about green use of proceeds, tracking, impact reporting and external reviews, green bonds provide investors with an unprecedented degree of transparency.

Reporting by green bond issuers on the use of proceeds is considered a crucial element for the success of this market. Analysis of issuer reporting shows that, among the clearly identifiable projects, the majority is undertaken for climate change mitigation purposes. Specifically, these are mainly investment projects in renewable energy and energy efficiency, issued, perhaps not surprisingly, by utility and energy companies. As expected, market development is accompanied (and favored) by an increasing propensity to report by issuers, particularly in the latest years. With Europe leading the way in terms of both market regulation and participation, green bond finance is expected to maintain its sustained growth in the coming years. How easily this segment can be accessed by SMEs remains an open question.

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