On Bond Returns in a Time of Climate Change

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The impact of a particular market-based instrument, the EU-ETS, upon financial values has already been addressed by the literature; nevertheless, efforts pertain primarily to stocks, leaving the bonds field out of the picture. The objective of this paper is to assess the impact of low-carbon policy—the 2003/87/CE directive which generated EU-ETS— upon the bond returns of European firms.

In order to accomplish this objective, a Fama and French (1993) framework is employed for the first time. Alongside the two bond market factors proposed by Fama and French (1993), *TERM* and *DEF*, an EU-ETS participation factor is added, *GMC*. *GMC* (Green minus Carbon) is meant to mimic the risk factor in bond returns related to low-carbon policy, the 2003/87/CE directive in this case. It has been found that augmenting the Fama and French (1993) model for bonds with the *GMC* factor improves the effectiveness of the model, at least with regard to Europe between 2008 and 2018. This holds true in the 2008–2018 time-span and in the 2008–2012 (Phase II) and 2013–2018 (Phase III) sub-periods.

The sensitivity of bond portfolio returns to the *GMC* factor has been found to be positive in the case of Green portfolios and negative in the case of Carbon portfolios. Most importantly, slopes on *GMC* are statistically highly significant. Ultimately, the average value of *GMC* itself is positive: a positive *GMC* means that in Europe, in the 2008–2018 time-span, there is no carbon premium as some of the literature asserts, but rather a green premium. The presence of a green premium in the European bond market in the years 2008–2018 is a useful asset management insight for financial practitioners. In other words, low-carbon investments can no longer be understood solely from the point of view of taking an ethical stand: nowadays, as the green premium shows, investing in low-carbon firms is a profitable exercise.

Recently, the literature has proposed stress testing, a technique developed for testing the stability of an entity, as an evaluation framework for climate change risks. The carbon stress test put forward, which leverages the *GMC* factor, is able to indicate the impact of an EU-ETS average price increase upon bond returns: results show the effects of a plausible but more severe EU-ETS average price on bond portfolios and on individual bonds. The low-carbon transition risk stress test provides useful insights to legislators in terms of the financing of the low-carbon transition, i.e. increasing capital inflows towards green firms and capital outflows from carbon firms. The low-shock scenario, for example, would provide an additional boost to the low-carbon transition, without harming excessively high-carbon firms.

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