



Policy tightening and responsible portfolios: can bonds fit well?

Fixed-Income Securities

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1. Introduction

In the current situation of the financial market, investors are reasonably giving a lot of attention to central banks' actions and inflation expectation. An overheating economic system may need to be cooled through measures such as interest rate increases by the authorities, to prevent the situation to become unbearable firstly for consumers and then, consequently, also for firms and for the economy itself. Such an intervention is arguably necessary now, even though part of the growth in consumer prices we're witnessing may be due to non-ordinary events such as wars. Nevertheless, investors are one of the categories that is likely to be hit the most by this kind of policy: switching from a very longeval, very low interest rates environment to a tighter one may be a challenge for investors' returns and portfolio allocation decisions. In this report we aim to provide a broad overview of how bond returns relate to changes in monetary policy and to equity returns, and whether there could be alternatives that, while still belonging to the fixed income world, may result a good addition to a portfolio, in the current context and with an eye to a socially responsible investing approach.

2. Monetary Policy and its effects on bonds

Monetary policy has been making headlines since the beginning of the COVID-19 pandemic. From Quantitative Easing (QE) reappearing in the US at the beginning of 2020 to interest rate hikes 2 years later, monetary policy is undoubtedly something investors should know and pay attention to as it has an important impact in the broader economy and in both bonds and stocks.

Monetary policy is the set of tools that a central bank possesses to control the money available in the economy as well as the channels by which new money is supplied (Investopedia, 2021). The main goal of monetary policy is to promote sustainable growth by keeping the economy working at a rate that is neither too hot nor too cold. There are therefore 2 types of monetary policy. When the economy is cold and working to slow, central banks implement an expansionary monetary policy which aims to increase the money supply in the economy (Corporate Finance Institute, 2021). When the economy is "overheating" and working to fast, central banks implement a contractionary monetary policy (Corporate Finance Institute, 2021).

It is important to note that different central banks have different goals. For instance, the US Federal Reserve (FED) has a dual mandate which means that they focus on keeping maximum employment and stable prices (Federal Reserve, 2021), while the European Central Bank (ECB) and the Bank of England (BoE) only have a single mandate to focus on price stability (Meyer, 2001). This difference in objectives significantly influences monetary policy and explains differences in the tools and timing used by the central banks.

2.1. Monetary Policy Tools

The first main tool of monetary policy available to central banks are interest rates. A central bank influences interest rates by changing the base rate which is the rate that is charged by central banks to other banks (Corporate Finance Institute, 2021). If the central bank increases the base rate, it's more expensive for banks to borrow money and they will therefore increase the interest rates they charge their customers thereby increasing the costs of borrowing in the economy and decreasing the supply of money. The opposite happens when a central bank decreases the base rate.

The second main tool of monetary policy is reserve requirements. Reserve requirements consist of the minimum amount of funds that banks must have at any time to ensure that it is able to meet liabilities in case of sudden withdrawals, the banks are not allowed to lend these funds (Chen, 2021). When a central bank decreases the reserve requirements, banks can lend more money and increase the supply of money in the economy. The opposite happens when a central bank increases reserve requirements.

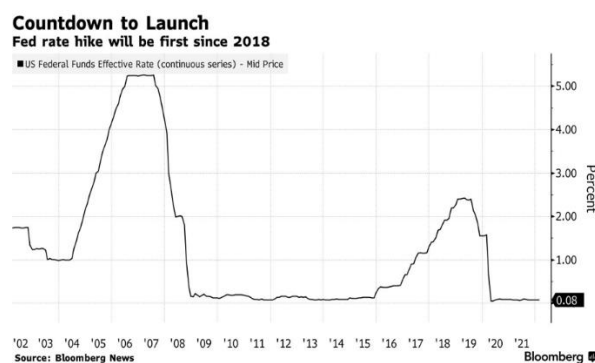
The last main tool of monetary policy is open market operations (OMO). OMO consists of the purchase or selling of government securities in the open market by the central bank (Federal Reserve, 2022). When the central bank buys securities it increases the supply of money and consequently decreases the federal funds rate which is the rate that banks charge each other for loans, this further increases the supply of money (Hopper, 2021). The opposite happens when a central bank sells securities.

When the COVID-19 pandemic hit, the western world was plunged into chaos and their economies experienced brutal slowdowns as people were forced into quarantine and stores had to close. To ensure its goals of sustainable growth, central banks around the world had to

implement an expansionary monetary policy. Indeed, in 2020 central banks across the world cut interest rates around 200 times (Mutlu, 2021). In the US, the FED announced in March that it was cutting its interest rate to 0, engaging in OMO to purchase \$700 bln worth of securities in a QE program (Liesman, 2020), and decreasing reserve requirements to zero (Federal Reserve, 2020).

As the pandemic started to ease in 2021 and inflation soared around the world due to supply chain issues, increases in commodity prices, and significant expansionary monetary policies, central banks had to change their approach. In the US after months of deliberations, the FED ended its QE program in March 2022 (J.P. Morgan Chase, 2022), and raised interest rates for the first time since 2018 (Matthews, 2022) as seen in Figure 1.

Figure 1



Source: Bloomberg News

2.2. The impact of monetary policy on bonds

The different types of monetary policies and tools all have an important effect on debt markets. Indeed, bond yields are significantly affected by monetary policy, more specifically interest rate changes. Bond yields are a function of coupon payments and bond prices, so as the bond price increases, its yield falls. When interest rates are low, bond prices will increase as investors will be looking for better returns and won't mind paying extra for bonds paying higher coupons compared to the now lower interest rate. It is therefore no surprise that when the FED started its expansionary monetary policy in March of 2020 and cut interest rates to 0, bond yields fell. Indeed, the US 10-year treasury yield fell from 1.5 in mid-February 2020 to a low of 0.57 in March of 2020 (Franck & Li, 2020), which also happened to 5-year and 30-year US treasuries.

As the FED started discussing and planning the switch to a contractionary monetary policy in which it would increase interest rates and wind down its QE-program and shrinking its balance sheet, bond yields started to rise. Since most bonds pay a fixed rate that becomes more attractive when interest rates fall, when

interest rates rise investors will be less attracted by the bond rate resulting in the decrease of the bond price and consequently the increase of the bond yield.

Figure 2 highlights the changes in the yield of US 10-year treasuries. As can be seen, the yield fell sharply on March with the start of the expansionary monetary policy and started to increase steadily as investors anticipated the change to a contractionary monetary policy and then increased exponentially when the FED started implementing the interest rate hikes and finished its QE-program in March of 2022.

Figure 2



Source: Yahoo Finance

2.3. Discussing a potential difference between corporate and government bonds

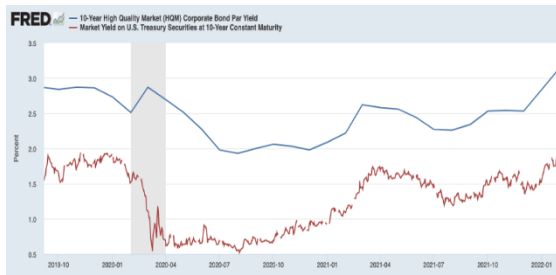
Given the impact of monetary policies on bond yields and prices, investors may wonder if investing in corporate bonds would be a better choice than government

bonds, or vice versa, during periods of transition in monetary policy. Additionally, corporate bond yields offer a better picture of the economy since they capture the conditions of the debt market that non-government participants face which would aid policymakers in their decisions. It is therefore important for investors and policymakers to know if there are significant differences on the impact of monetary policy between corporate and government bonds.

Corporate bonds tend to be riskier and lower rated than government bonds since they are guaranteed by companies and not governments with the power to raise taxes, as a result bond rates and yields are also higher to compensate for the increase in risk.

As can be seen in figure 3, a 10-year High Quality Market (HQM) Corporate Bond index does have a higher yield throughout time than the 10-year US treasury yield. Figure 3 suggests that there isn't a significant difference in the impact of monetary policy between corporate and government bonds as seen by similar drops in March of 2020 and the subsequent increase throughout 2021.

Figure 3



Source: US Department of Treasury

Having said that this analysis is very simplistic as it doesn't consider different maturities, different corporate bond ratings, different countries, and different time periods. Therefore, if investors and policymakers alike would like to know more about this topic I recommend reading "The Impact of Monetary policy on Corporate Bonds under Regime Shifts" by Guidolin et al. (2015), and "Monetary Policy and Corporate Bond Returns" by Kontonikas et al. (2016).

3. Trees, hurricanes and rhinos in your portfolio: how untraditional bonds can improve future portfolio performance

Bonds are broadly seen as the most classical asset class together with stocks, or public equity. While it could be easy to think to shift to a larger bond allocation when the stock market is seen as set to suffer, there's

no guarantee that investor would be best off indeed. To be a good alternative to an asset class, another one should either offer better returns in most possible scenarios or be an effective hedge in specific ones. Correlation and regression beta's may help out for that. Specifically, correlation measures the frequency at which two variables move in the same direction. In this section we look at the changes in correlation between stocks and traditional bonds, before focusing also on some untraditional fixed income products and their ability to work as an equity hedge.

3.1 Outlining the relationship between equity and bonds and recent research

Arguably, stock and bond prices share a common driver, interest rates, which in both cases impact the factor any cash flow is discounted with. Nominal interest rates can be decomposed in real and inflation rates. While the former is likely to cause analogous price movements for these asset classes, the second's effect is more ambiguous: many bonds have a predetermined schedule of fixed payments that do not adjust to account for buying power changes. By contrast, public companies have some possibility to adjust

the price of the goods and services they offer to react. Stocks of firms involved in sectors such as Materials may even benefit from higher inflation, overall. For this reason, the correlation between equity and bonds has had a high degree of variation over time, ranging from -0.4 to above 0.6 in the US, for example, despite having been positive most of the times (Credit Suisse, 2022). In the UK, no negative correlation has been seen except during a small period in the Seventies. This, until 2000.

Many shocks to the financial system, such as the Dotcom bubble burst, the Global Financial Crisis, the European sovereign debt crisis, COVID-19 have profoundly altered normal asset behavior. In many developed countries stock-bond correlation has been negative for the past 20 years. As we can see in Figure 4, it tended to decrease in highly volatile market periods such as crisis, as was still negative at the beginning of the year¹. Related research provides various possible explanations: Ilmanen (2003) argues that this figure is likely to be negative in a low of low, stable inflation as well as during financial crisis. Connoly et al. (2005) and Baur and Lucey (2009) agree with the latter and elaborate on it pointing out that during market stress episodes,

flight-to-safety waves cause large negative, volatile stock returns and large bond returns. From a more macroeconomic point of view, Campbell et al. (2020) notice that the correlation between output gap and the US switched from negative to positive from 2000: as real bond returns are decreasing in inflation, higher economic output fuels stock returns, so this would explain the more negative stock-bond correlation. Finally, consistently with the recent periods, Baele and Van Holle (2017) state that this latter is likely to be strongly negative only if monetary policy is accommodating and, jointly, inflation is low, while it turns positive as soon as policy tightens.

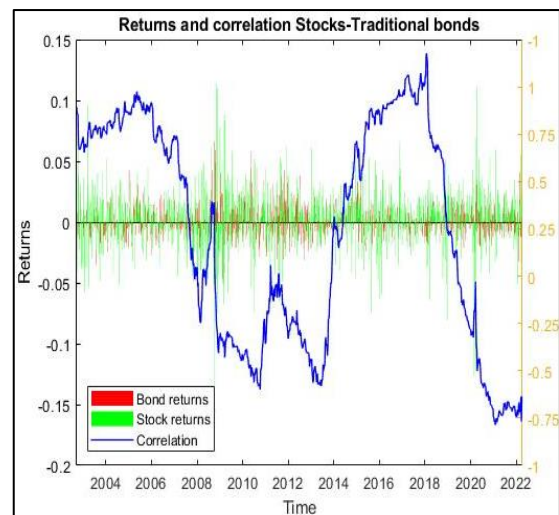


Figure 4

¹ Correlations here are calculated from weekly return data over 104 past weeks horizons. The ones in Figure 1 are weekly return as well. The proxy for

equity and bond returns are the MSCI World Index and the Vanguard Total Bond Market Index Fund returns. All the returns are euro-based.

After many years of extremely low interest rates and large amount of liquidity pumped in the market, interest rate increases are – finally? – on the horizon also in Europe. A consequent natural question at this point is how to adjust our portfolios to counter for a loss in bonds’ diversification benefit, if correlation rises.

3.2 Classic portfolio analysis, stranger bonds

The starting point is an investable portfolio consisting of a position in global equity and one in traditional bonds, respectively represented by the Invesco MSCI World ETF and the Vanguard Total Bond Market Index Fund, while the risk-free rate is set equal to the yield on the 10-year German government bonds, about 0.25% per year. Using return data for the past 4 years and a half, under a simple portfolio optimization problem with individual weights constrained between 0 and 100%, the optimal portfolio results invested 69% in equity and 31% in bonds, with an average monthly return of 0.61% and a standard

deviation equal to 1.74%. Since ESG and SRI criteria are becoming more and more important in the asset management industry, it may be interesting to know what some related types of securities such as green, sustainability-linked or even catastrophe bonds can offer in terms of portfolio performance. For brevity, return correlation between equity and the various types of bonds, and between types of bonds are all displayed in Figure 5².

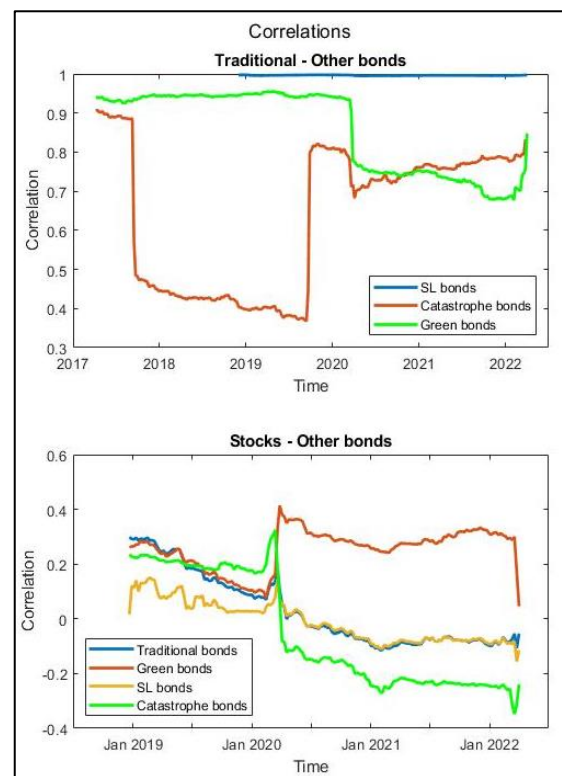


Figure 5

At least in this sample period, the one between traditional and sustainability-linked bonds is surprisingly high: this will have consequences also on the outcome of the specific portfolio analysis. Jumps in

² The remaining asset type returns are represented by the Fidelity Sustainability Bond Index Fund, the

S&P Green Bond Index and the Swiss Re Cat Bond Index returns.

correlation coefficients coincide with shocks to the financial system: COVID-19's first impact is well visible here and, as for catastrophe bonds, the natural events occurred in 2018, such as many hurricanes occurred in the US, provoked a strong deviation of their returns from the ones "plain" bonds.

3.2.1 Green bonds

A green bond is a fixed income instrument whose financing proceeds must be used for specific green, environmental projects. The annual issuance has been surpassing three-digit billion \$ since many years and touched \$269.5 billion in 2020 according to the Climate Bond Initiative. Not every company can afford to benefit from a green bond issuance, due to the strict requirements to meet with the money borrowed, that must be used for predetermined and clearly environmental-friendly projects the company can work on to mitigate its impact on the planet. This mitigates, but does not nullify, the risk that companies will use the money raised for environmentally or socially harmful purposes. As for investors' financial point of view, the only element that usually makes green and traditional bonds differ is a tax benefit to favor the investment in the first category. Probably for this reason the

correlation between them has been the highest in our sample for most of the analyzed period.

The iShares Green Bond Index ETF acts as our proxy for returns, equal to 0.037% per month, the lowest recorded in the sample, with a standard deviation around 0.61%. Consequently, the optimal stock-green bond portfolio results fully invested in stocks.

3.2.2 Sustainability-linked bonds

The International Capital Market Association defines SLBs as any type of bond instrument for which the financial and/or structural characteristics are flexible and vary depending on whether the issuer achieves predefined sustainability or ESG objectives. Commonly, a coupon step-up feature is included and triggered whenever the issuing company fails to achieve certain planned goals. Some concerns about these securities stem from this fact: investors benefit the most when the company fails to accomplish their sustainable targets. Furthermore, unlike with green bonds, issuers can use the proceeds from the issuance for any purpose, and thus the possibility for "sustainability washing" are higher (NN Investment Partners, 2021). This skepticism is reflected in the market, willing to buy green bonds at a premium

while uncertain about sustainability-linked bonds.

The returns from these bonds are assumed to be the ones of the Fidelity Sustainability Bond Index Fund, that achieved a performance equal to a monthly 0.066% (standard deviation 1.04%) in the past 4.5 years. Our optimal equity-SLB portfolio doesn't show an outstanding improvement from the equity-bond ones, with return and standard deviation equal to 0.6 and 1.68% and weights 30/70%.

3.2.3 Catastrophe bonds

These securities are probably the most longeval among those described in this report, after stocks and traditional bonds. The first catastrophe bond issuance dates back at the beginning of the Nineties in the US, when similar securities, such as catastrophe options, traded at the Chicago Board of Trade (CBOT). Born as a disaster risk-sharing solution to allow property and casualty insurers and reinsurers to reduce excessive exposure to earthquake and hurricane events, their popularity experienced ups and downs in the last 30 years. States, insurance and non-financial

companies have made use of them, but the complexity of measuring and quantifying the probability of future occurrence of such historically “low-frequency-high-impact” events made pricing them too difficult. Indeed, it usually favored investors, who have often cashed in generous coupons while almost never facing materialized “trigger events”³. Indeed, the attractiveness of cat bonds for an investor comes from the high coupons paid, above 4% for 79% of the current amount outstanding (source: artemis.bm), and certainly also from the low credit risk undertaken, since issuance proceeds are kept by a trustee and invested in highly rated instruments. The bondholders could lose up to 100% of the principal and/or coupon payments, depending on the terms of the issuance, if any ‘trigger events’ occurs: only in that case the capital is transferred to the bond sponsor. As reported by Artemis.bm (2022), after a temporary decrease in the new issuances between 2018 and 2020, years in which we assisted to many natural catastrophic events especially in the U.S., the market has now reached new heights. Catastrophe bonds offer the lowest correlation with the stock market in this sample thanks to their structure and low

³ A recent example is about the Pandemic Bonds issued by the World Bank in 2017 to financially help poor countries to counter possible pandemics. Because of how the trigger requirements were structured, it took around four months to get the

capital raised available, after the start of COVID-19. Bondholders have still been able to receive coupon payments based on spreads between 6.5 and 11.10% over the LIBOR rate before every trigger requirement were met in the late July 2020.

credit risk and may be still providing returns above expectations especially if priced during high worry about climate events. Furthermore, SRI investors may find in them an instrument to take part to efforts in helping countries hardly hurt by natural events without renouncing to an instrument with an attractive return-risk profile. Finally, all else equal, the modified duration of bonds with high coupon rates, such as cat bonds or less safe speculative grade bonds, is lower than the one of products paying less generous coupons. This makes these insurance-linked securities less sensitive to increases in policy rates.

The average monthly returns provided by the Securis Catastrophe Bond Fund amounts to 0.11%, with a 1% standard deviation. Buying fund shares is probably the only way to invest in them for retail individuals, since direct trading is limited to qualified investors almost everywhere. The 22/78% equity-cat bond optimal portfolio delivers a 0.62% monthly returns, with a standard deviation equal to 1.55%. These results must be weighed with the tail risk of these instruments: huge losses are possible whenever a climate event occurs, and a set of cat bonds large enough to diversify this risk may be unavailable or uneconomical in

terms of transaction costs. Cat bonds should probably account, at best, for a small fraction of the assets in anyone's portfolio.

3.3 Comparisons and considerations

Looking at the portfolios, it's easy to rank them on their performance over the sample period. In terms of M^2 measure⁴, the cat-bond delivers a monthly 0.088% volatility-adjusted excess return, followed by the SLB portfolio (0.013%) and lastly the green bond one (-0.17%). If combined in a unique portfolio to seek further diversification, the improvement is minimal ($M^2=0.089%$) and 71% of the portfolio still invested in catastrophe bonds. Figure 6 provides a visual summary of the main results. The green bond portfolio is strongly inefficient when compared to the others and is not completely visible in both sub-charts.

Numbers are strongly in favor of catastrophe bonds but, besides what mentioned before about the riskiness of these products, the aim of this analysis is far from stating where to invest savings in the future: many other asset classes that were not considered here may have profiles that are more beneficial or at least likely to

⁴ The M^2 measure is the excess return of the portfolio over a benchmark, adjusted for its volatility relative to the one of the benchmark.

Despite delivering the same ordinal ranking of the Sharpe Ratio measure, it allows to quantify over(under)performance directly in terms of return.

change the outcome of any portfolio optimization. Instead, a quick outlook has been provided about more or less well-known instruments that for their characteristics well fit in nowadays' discussion about environment and social responsibility.

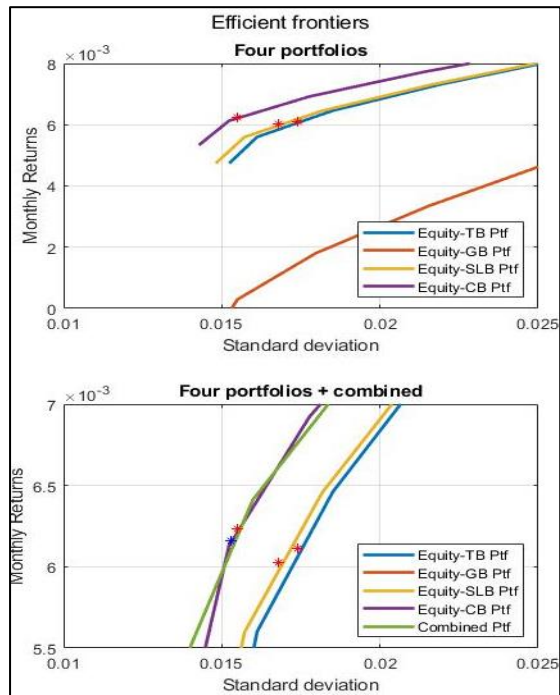


Figure 6

Nevertheless, this was a very small subset. The World Bank has recently sold its first “rhino” bond: \$150 million of capital raised to contribute to the preservation of South African black rhinos from extinction. Investors while get a return between 3.7% and 9.2% in five years if the population increases, and just the capital invested back otherwise (source: Reuters). Will be rhinos the diversifiers of our tomorrow's portfolio?

An aerial night view of a city skyline, likely New York City, featuring a river and a bridge. The city lights are visible against the dark sky, and the water reflects the lights. The overall tone is blue and dark, with some warm lights from the buildings and streets.

Conclusion

In the current times of changes in monetary policy, high inflation, and unpredictable macroeconomical and political events, investors should increasingly focus on their portfolio allocation and how diversified they are as well as the potential impact of these events on their investments. After explaining monetary policy and its different tools, detailing its effects on corporate and government bonds, and exploring different portfolio allocations namely of equity combined with traditional bonds, green bonds, sustainability-linked bonds, catastrophe bonds, and all the above, we see catastrophe bonds as a good candidate for a – small – portion in a portfolio, capable of generating good returns in increasing rates environment and somehow suited also to a responsible approach.

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