The story of A vs IO

Refinancing, foreign sell-offs and buybacks

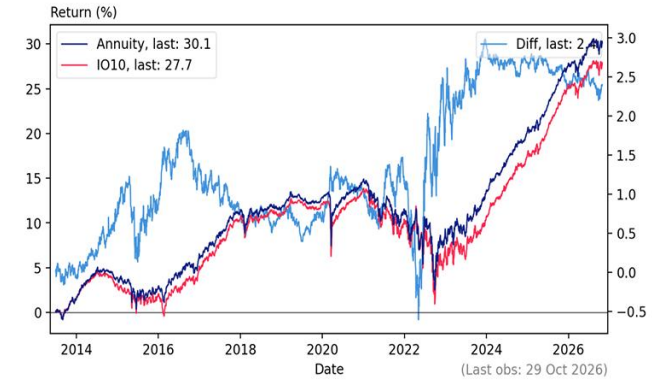
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- Refinancing has not been a primary driver of relative returns on A and IO10 bonds since 2014
- Foreign sell-offs hit (certain) IO10 bonds hard in 2022
- IO10 bonds did benefit from extra buybacks in 2022 but it is crucial to realise this effect while it lasts!

As input to the discussion on pricing of new bond series, this research note revisits the past performance of 30Y A and IO10 bonds. Key conclusions from an earlier research note in 2024 still hold, particularly the importance of realising the effect of extra buybacks in IO10 bonds while it is there. However, more detailed examinations of the pivotal year 2022 also suggests that the actions of foreign investors were just as important as those of borrowers. To accept a lower OAS on IO10 bonds, investors must either believe that they can continue to harvest the higher carry or that they will have an opportunity to realise an extra buyback gain.

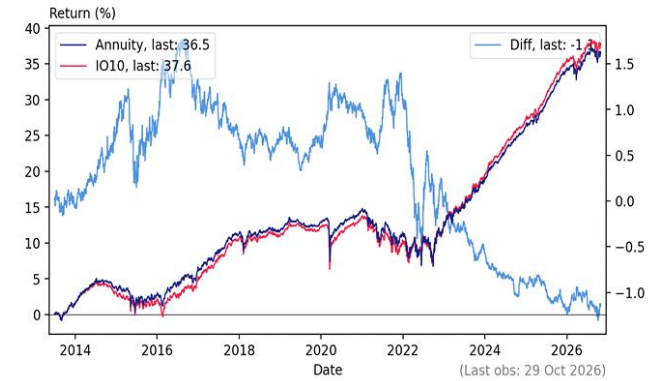
Swap-hedged returns on 30Y A and IO10 portfolios



Shows the swap-hedged returns on "twin portfolios" of A and IO10 bonds. For more details on the structure of the portfolios, see below.

Source: Nykredit Markets

Swap-hedged returns: 30Y A and IO10 portfolios (price of > 90)



See note above. Shows the return at a minimum price of 90.

Source: Nykredit Markets

A or IO10: What does history tell us?

The new 59 series have reignited the debate about the relative pricing of A and IO10 bonds. A number of factors come into play in this debate, and as one input, this research note revisits the past performance of A and IO10 bonds.

The key points of this research note are:

- IO10 bonds offer higher carry than annuity bonds, even after hedging the difference in (model) duration. However, this partly reflects the fact that IO10 bonds also have more negative convexity and higher vega in the model.
- In practice, however, annuity bonds appear to have outperformed IO10 bonds since 2014. This is attributable to the excess return generated in 2014-2017 and again in 2022 (see top-left chart).
- The excess return on A bonds in 2014-2017 appears to be due to the fact that, in practice, IO10 bonds did not have higher duration than annuity bonds, contrary to what the model indicated. Hedging based on model duration therefore results in a loss on IO10 relative to A when interest rates fall, as they did in 2014-2017. The correlation between the excess return on A over IO10 and interest rates has weakened since then.
- The excess return on annuity bonds in 2022 was largely attributable to the repricing of IO10 bonds relative to annuity bonds amid heavy sell-offs of IO10 bonds by foreign investors. This particularly affected the 1'50 IO10 bond (relative to 1'50 A), and excluding this series, the excess return on A over IO10 was substantially lower in 2022.
- The large buyback surges in 2022 temporarily drove outperformance of IO10 over A due to the proportionally higher level of buybacks in IO10 bonds. Had the bonds been sold once their price fell below 90 (or 85), this "extra buyback gain" would have been realised, and IO10 bonds would have substantially outperformed annuity bonds in 2022 (see bottom-left chart).

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The research note thus indicates that some of the most important drivers of the excess return on the A portfolio over the IO10 portfolio since 2014 have been the actions of foreign investors and borrower buybacks. In both cases, these are factors that are not incorporated into the pricing in the prepayment model.

Whereas buybacks, at least temporarily, shielded investors from the higher spread risk, negative convexity and vega of IO10 bonds, selling by foreign investors had the opposite effect.

What next?

Looking at the 56/59 series of 30-year A and IO10 bonds, we do not consider the risk of heavy selling by foreign investors to be a major concern for IO10 bonds. Admittedly, foreign ownership of IO10 bonds is generally up to around 10 percentage points higher than that of annuity bonds, as is the case for the 4'56 series, for example. However, foreign ownership is generally lower than it was in the run-up to 2022, and current foreign investors are expected to be more stable than the Japanese investors proved to be.

On the other hand, we do not see a high likelihood of a major buyback surge either, and consequently nor of significantly higher buybacks of IO10 bonds relative to annuity bonds. However, this does not mean that higher buybacks could not benefit IO10 bonds to a lesser extent over time.

At present, the strongest case for IO10 over annuity bonds is probably an expectation that the primary issuance coupon for 30-year callables will remain in the 3.5-5% range for some time yet, in which case IO10 bonds may be able to realise their higher carry.

The remainder of this research note explores the points above in greater depth and is aimed at the particularly interested reader.

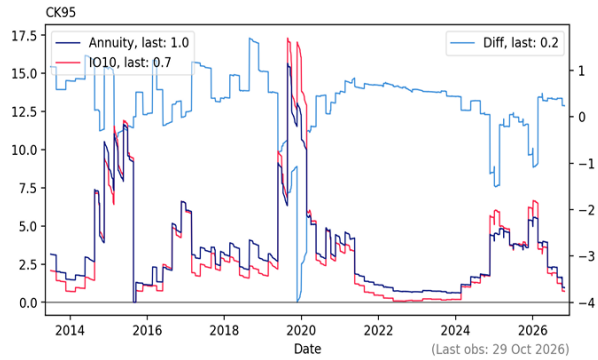
A vs IO10: A fresh look with swap-hedged returns

This research note follows up on a research note made in 2024 in connection with the previous change of maturity class Back then, we compared the past performance of two "twin portfolios" comprising 30-year annuity bonds and IO10 bonds, respectively, with A and IO bonds from the same issuer and with the same coupon and maturity assigned the same weight in their respective portfolios. In that research note, we had to base our comparison on outright returns, although we also considered the isolated return contribution from the OAS component to obtain a picture of relative returns adjusted for the difference in (model) interest rate sensitivity.

In this research note, we have based our comparison of A and IO10 on past performance where the delta vector has been hedged using a combination of swaps. This provides a picture of the difference in total returns after adjusting for differences in (model) duration. Naturally, we have also updated the research note with data for the most recent years.

The chart at the top of the first page shows the swap-hedged returns on the two "twin portfolios" as well as the difference

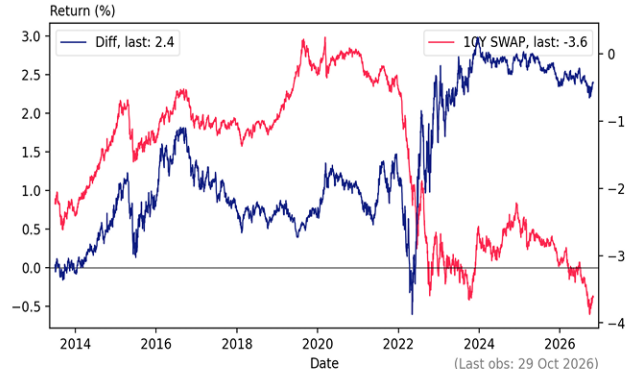
Higher prepayments in IO10 portfolio in 2019/2020



Shows weighted prepayments at the latest payment date for bonds in the two portfolios. A negative difference means that prepayments on IO10 were higher than on A at the latest payment date.

Source: Nykredit Markets

A and IO10 portfolios: Difference in return and 10Y swap rate



See notes above. The blue curve shows the difference in return on the two portfolios.

Source: Nykredit Markets

between them (right-hand axis). Four observations immediately stand out:

- Overall, returns have been higher on the A portfolio than on the IO10 portfolio
- The A portfolio generated most of its excess return in 2022
- However, the A portfolio also generated some excess return at the beginning of the period, ie in 2014-2017
- There was no significant excess return on the A portfolio during the major refinancing surge in 2019/2020.

The following sections take a closer look at these observations.

The major refinancing surge in 2019/2020

At the October 2019 and January 2020 payment dates, there was a historically large refinancing surge into lower coupons, with prepayments on IO10 bonds generally somewhat higher than on A bonds (see the top chart on this page). However, this episode does not immediately stand out as one of the key

drivers of the relative returns on the A and IO10 portfolios over the full period.

This is presumably because the higher propensity for refinancing among IO10 bonds had already been priced in to some extent. In addition, the generally lower price of an IO10 bond compared with the corresponding A bond means that it can sustain somewhat higher prepayments without this resulting in a lower return. Finally, not all the bonds in the two portfolios are affected by prepayments at any given time, as only a subset will be trading above par.

Excess returns on A bonds in 2014-2017

Excess returns on the A portfolio over the IO10 portfolio in 2014-2017 was highly correlated with interest rate movements during the period, as illustrated by the bottom chart on this page. This was presumably because matched pairs of A and IO10 bonds were priced, at least on a day-to-day basis, with fixed or lagging price spreads, meaning that the difference in duration was effectively smaller than suggested by the model. When we hedge based on model duration, such pricing dynamics mean that, in practice, we have "overhedged" the IO10 bonds, resulting in a loss relative to annuity bonds when interest rates decline. Importantly, however, the correlation between interest rate changes and the return differential between the A and IO10 portfolios has been significantly weaker since 2018. This suggests that the tendency for IO10 bonds to have "too low" a duration may have actually diminished over time.

Excess returns on the A portfolio in 2022?

In the top chart on the first page, the A portfolio initially underperforms the IO10 portfolio in 2022, but subsequently recovers its losses and more, leaving the A portfolio with a good excess return for the year as a whole. At first glance, this seems intuitive given that, according to the prepayment model, IO10 bonds have higher spread risk, more negative convexity and higher vega than A bonds. They should therefore also suffer larger losses in a year such as 2022, when spreads, interest rates and volatility all rise sharply.

However, there is more to the story than just the differences in key figures. First, a large part of the A portfolio's excess return for 2022 as a whole can be attributed to the excess return on the 1'50 A bond relative to the 1'50 IO10 bond. Excluding this pair of bonds from the portfolios paints a somewhat different picture for 2022, as illustrated by the top chart on this page. In this case, the A portfolio temporarily underperforms the IO10 portfolio during the major buyback surges, when buybacks were proportionally higher in IO10 bonds. However, this "buyback effect" on pricing dissipates as buyback activity subsides, and for 2022 as a whole, neither portfolio clearly outperforms the other.

So what happened to the 1'50 bonds? Well, foreign ownership of the 1'50 bonds was fairly high, and during 2022 foreign investors began to sell down their holdings. The selling was particularly pronounced in the IO10 bonds, as also illustrated by the bottom chart on this page. In mid-2022, as foreign investor selling of the 1'50 IO10 bond intensified while buybacks also (temporarily) slowed, the 1'50 IO10 bond was repriced and significantly underperformed the 1'50 A bond. Given the size of these series, this repricing had a significant impact on the performance of the two portfolios.

Second, the temporary buyback effect on the relative pricing of A and IO10 bonds discussed above would have a lasting impact on the relative returns of the two portfolios if the bonds were sold once their price fell below a certain threshold. In 2022, broadly speaking, this would have meant selling the bonds altogether while buyback activity was high, thereby realising the buyback gain. Consequently, the A portfolio significantly underperforms the IO10 portfolio over the course of 2022 if a minimum price threshold of 90 is applied. The picture does not change materially if, for example, 85 is used instead (see bottom chart on the first page).

Higher overall returns on A than on the IO10 portfolios?

For the period as a whole, the question of which of the two portfolios performed better therefore also depends on whether the buyback gain on the IO10 bonds in 2022 is realised before it disappears again.

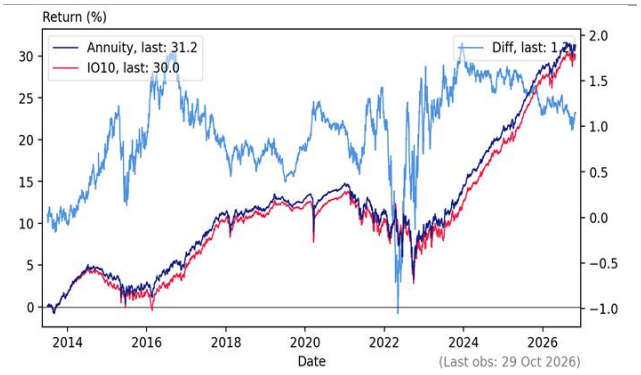
It is also worth noting that applying a minimum price threshold of 90, or indeed 85, would have meant selling the 1'50 bonds before the repricing in mid-2022 that otherwise had a significant impact on relative returns.

Old news and new news

Whether the buyback effect is realised was also one of the key conclusions of the previous research note discussed above. However, this research note confirms that this conclusion still holds when considering total returns after swap hedging, rather than just the OAS component.

A closer examination of 2022 in the present research note does, however, underline that the picture was shaped not only by the proportionally higher buybacks by IO10 borrowers, but also to a large extent by the actions of foreign investors, particularly the extent of their selling of the 1'50 IO bond.

Excl 1'50 A/IO10



Source: Nykredit Markets

Foreign holdings: Additional sell-offs of 1'50 IO10 in 2022



Shows foreign holdings of NYK 1'50 A and IO10, respectively.

Source: Nykredit Markets and Danmarks Nationalbank

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