AT1 Capital Bonds

Better as Beta?

For professional investors/qualified investors/qualified clients only

Invesco EMEA ETFs

Summary

- **The first Additional Tier-1 Capital Securities ("AT1 bonds") were launched in 2013 and by mid-2014 the market had already grown to over $100bn.** The potential for inefficiencies in this new and rapidly-growing asset class made it an attractive market for active managers. Of these, two active UCITS financial credit funds established themselves as leaders in the AT1 market. Given their size and sophistication, these funds provide a useful proxy with which we can analyse the opportunity for active managers in financials credit, and specifically in AT1 bonds.

- **By 2016, just three years after their introduction, there were strong indications that the opportunities for active managers to outperform in AT1 bonds were diminished.** Returns of both leading active financials credit funds showed very high correlation with a pure USD AT1 benchmark and were unable to deliver persistent outperformance on either an absolute or risk-adjusted basis.

- **The Invesco AT1 Capital Bond UCITS ETF was launched in 2018 to provide a low-cost, passive, AT1-only alternative to active funds.** Since launch, there has been a similarly high degree of correlation and even more similarities in performance, between the leading active funds and the ETF, with the ETF generally out-performing under most "normal" market conditions.

- **A possible explanation for the lack of active outperformance is that financial sector credit is an unusually narrow and homogeneous universe for an active fund.** A multi-year historical analysis of a representative sample of AT1 bonds shows a persistently high degree of correlation of returns which reduces the potential outperformance from security selection. The similarity between the performance of the active funds analysed and the pure AT1 benchmarks suggests that widening the investment universe to "financials credit" provides limited additional opportunity. With such high observed correlations, the lack of active outperformance may be less about the manager and more about the market.

- **In the extreme market volatility of March-April 2020 we find the active strategies were able to mitigate some of the impact of the sell-off but gave back much or all of this outperformance in the snap-back.** Overall, we find that the two active funds' performance during the crisis period was no better than a model portfolio that simply mirrors the inflows and outflows from the Invesco AT1 ETF. The more normal market conditions seen since late April have coincided with a return of the outperformance of the AT1 ETF that had been previously observed.

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Origins of AT1 bonds

One of the most controversial actions taken in response to the Global Financial Crisis (GFC) was the use of public funds to recapitalise ("bail out") banks. In the Basel III agreement of 2009, regulators took bold steps to reduce the likelihood that similar actions would be needed in the future. One of these was to require banks to increase their ratio of Tier 1 capital to risk-weighted assets[1] to a minimum of 6.0%, of which 1.5% was required to be in a new class of security called an Additional Tier-1 Capital ("AT1") bond.

AT1 bonds are debt instruments with a trigger that causes them to be automatically written down in value if a key measure of the issuer's financial strength drops below a pre-set level[2]. They were designed as a loss-absorption mechanism: if the bank becomes insufficiently capitalised, the bonds trigger, and their write-down strengthens the bank's financial position by reducing its liabilities. The first AT1 bond was issued by BBVA in April 2013. By June 2014, there was more than $100bn of AT1 bonds outstanding[3].

The opportunity for active

During the early years of the AT1 bond market, the valuation and risk-management of these new securities posed many challenges:

- *Unfamiliarity:* AT1 bonds had limited historical trading or valuation standards and there was uncertainty as to how the market would react if a bond triggered.
- *Heterogeneity:* The different terms and trigger mechanisms of each bank's bonds required analysis to determine the fair yield to compensate for the risk.
- *Higher risk:* Banks were less well-capitalised, increasing the risk of a trigger.
- *Rapid growth:* The high volume of new issuance made supply/demand dynamics difficult to anticipate, and secondary market liquidity was still uncertain.
- *News sensitivity:* AT1 bonds were uniquely sensitive to the views and public statements of both European and individual country regulators.

This newness and uncertainty created inefficiencies for active managers to exploit to generate excess returns. Of these, two active UCITS funds specialising in financial sector credit emerged as the "go-to" vehicles for investors looking for exposure to AT1 bonds. Today, these funds manage over $14bn in combined assets. We will refer to them as **Fund A** and **Fund B**, with specific details of each fund provided in Appendix A.

These funds are chosen because they provide a useful proxy for the opportunity for active managers due to: (a) their large size, (b) their divergent styles with Fund A employing derivatives to a far greater extent, (c) their age, having both been in existence since at least 2013, and (d) the fact that they do not specifically target an AT1 benchmark but focus on the broader financials credit market.

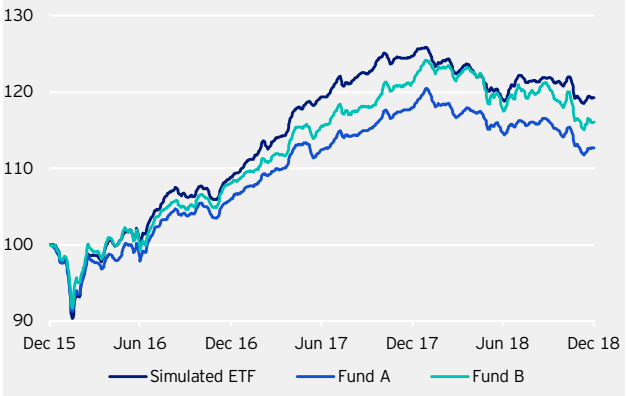
Market maturing

Given the regulatory obligation to issue AT1 bonds, the market grew quickly. By mid-2015, there were sufficient securities available for index providers to begin to offer pure AT1 indices.

Using these indices as a reference, signs soon emerged that active funds were struggling to differentiate themselves and were actually delivering index-like returns. Between 2016 and 2018, the R^2 correlation between Funds A and B and a USD-only AT1 benchmark were 90% and 82% respectively[4].

In **Figure 1,** we simulate the performance of a hypothetical passive AT1 ETF and compare it versus the two active funds. We find the ETF is the best performer, on both an absolute and risk-adjusted basis, over the full period and in each of the three years individually[5].

Figure 1 - Active funds versus passive model



	Total return	Annualised volatility	Annualised return / volatility
Simulated ETF	19.3%	5.3%	1.1
Fund A	12.9%	4.9%	0.8
Fund B	16.1%	7.7%	0.7

Past performance is not a guide to future returns. Source: Bloomberg 31 Dec 2015 – 31 Dec 2018. Returns normalised. Simulated ETF return is equal to the Bloomberg Barclays Contingent Capital USD Total Return Index less a daily-accrued management fee of 0.50% p.a..Details of Fund A and Fund B are provided in Appendix A. The graph shows the 5-day moving average. Returns and volatility are calculated using daily data.

Better as beta?

Active management benefits from divergent performance across assets: put simply, a market in which owning the "right" securities makes a difference.

In this light, financial sector credit is an unusually narrow and homogenous investment universe for an active UCITS fund[6]. The global market for AT1 bonds consists of roughly 250 securities from 100 issuers. Of these, only a limited number have sufficient liquidity for an institutional investor. What's more, all AT1 bonds represent a similar type of risk (subordination / trigger) for similar issuing entities (large financial institutions). Broadening the investment focus to financial sector credit will increase the pool of eligible assets, but achieves limited incremental diversification as many of the newly included securities are issued by the same (or highly similar) issuers and their performance is therefore driven by many of the same underlying factors.

This suggests that AT1 bonds may be best viewed as a whole – a "beta" exposure that can be added to a portfolio for its particular risk and return characteristics, rather than as a market within which to try to generate "alpha" through security selection.

The arrival of passive

In June 2018, the **Invesco AT1 Capital Bond UCITS ETF** ("Invesco AT1 ETF") was launched to provide investors looking for a simple beta exposure to AT1 bonds with a liquid, passive alternative at a lower cost (OCF of 0.39%).

The Invesco AT1 ETF tracks an index[7] of USD-denominated AT1 bonds, which is the largest and most liquid portion of the AT1 universe, capturing over 80% of European banks by market capitalisation. To avoid potentially illiquid securities, the index imposes a minimum issue size of $750 million and only includes issuers with a developed market country of risk. Issuer caps (8% for the five largest issuers, 5% for the rest) ensure the necessary diversification for UCITS compliance. As of September 2020, the index comprised 70 bonds from 23 issuers.

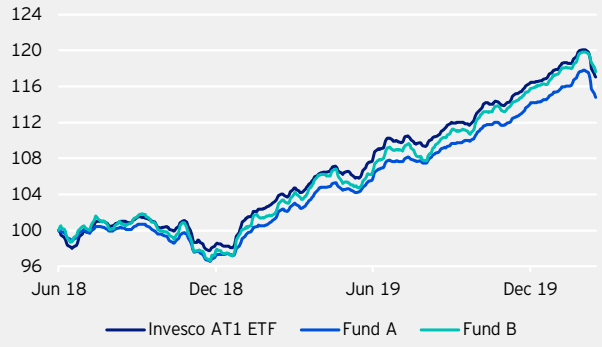
AT1 ETF performance: launch to March 2020

Since its launch, the performance of the Invesco AT1 ETF has exhibited a similarly high degree of correlation with those of Funds A and B as had been previously observed versus the simulated passive tracker.

If we look at the absolute performance of the three funds, however, the similarity is even more striking. Whereas in the previous analysis, the active funds' returns moved in tandem with the simulated passive tracker but were clearly differentiated, versus the ETF they are nearly identical.

As shown in **Figure 2**, over the 20 months and more than 20% rally between the launch of the ETF and the beginning of the market sell-off in March 2020, the Invesco AT1 ETF had the best absolute performance and was nearly tied for the best risk-adjusted returns, and the cumulative performance gap between the three strategies never exceeded 3.4%.

Figure 2 - AT1 ETF versus actively managed financial credit funds



	Total Return	Annualised Volatility	Annualised return / volatility
ETF	18.0%	3.8%	2.7
Fund A	15.5%	3.2%	2.8
Fund B	17.6%	7.0%	1.4

Past performance is not a guide to future returns. Source: Bloomberg from 19 Jun 2018 – 04 Mar 2020. "Invesco AT1 ETF" is the Invesco AT1 Capital Bond UCITS ETF. Details of Fund A and Fund B are provided in Appendix A. Returns normalised to 100 as of start of period. Total return is over the full period. Volatility is annualised. Annualised return / volatility uses an annualised equivalent to the full-period return. Graph shows 5-day moving average.Returns and volatility calculated using daily data.

It may be the manager... or maybe the market?

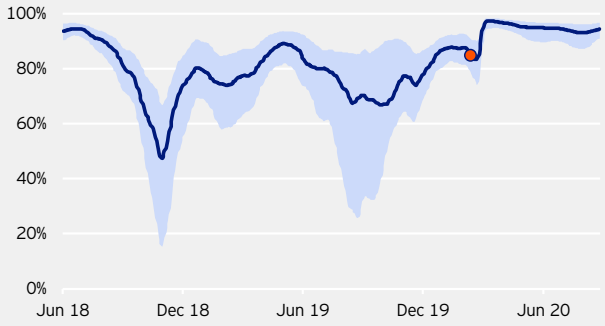
This lack of differentiation between the returns of active and passive strategies over such an extended period is largely explained by the extremely high degree of correlation across the underlying bonds.

Figure 3 shows the median pairwise correlation across a representative sample of twenty of the largest and most liquid USD AT1 bonds over rolling six-month periods, since the launch of the Invesco AT1 ETF.

The average over all periods prior to the March 2020 sell-off (at which point correlations spike to nearly 100%) is 78%, with fewer than 20% of observations below 70%. By way of comparison, the same calculation across the equity shares for the same issuers averaged just 51% and exceeded 70% in just 8% of periods.

This high degree of correlation dramatically reduces the opportunity for portfolio managers to generate excess returns through security selection. This further supports the view of AT1 bonds as a beta exposure best accessed through a passive instrument.

Figure 3 - Median pairwise correlation across a sample of AT1 bonds (with 25th-75th percentile range)



Source: Bloomberg. For each date, the dark blue line represents the median trailing 6m pairwise R^2 correlation across a representative sample of twenty USD AT1 bonds (all unique issuers). Light blue shaded region is the 25th-75th percentile range. Red dot indicates 5 Mar 2020, the start of the 2020 March market sell-off.

The 2020 market test

Global financial markets experienced unprecedented volatility in March-April of 2020. After hitting highs on 12 February, the AT1 market drifted lower before selling off violently between 5 March and 19 March, dropping 26.5%. The subsequent snap-back (see **Figure 4** on the next page) was similarly sharp, with the index recovering 60% of the loss to be down just 10.9% by 21 April. From this point onward the market began a steady recovery with lower volatility, setting new highs on 28 August.

While under normal market conditions, the performance of the ETF and active funds had been very similar, there was marked differentiation during the sell-off and snap-back periods. The spike in correlation across individual securities (as shown in **Figure 3,** where 5 March is indicated by the red dot) eliminated the opportunities for security selection. However, active managers were able to reduce exposure to mitigate the impact of the market movements on the fund. The ETF, on the other hand, remains fully invested under all market conditions.

As a result, both active funds were able to partially mitigate their losses in the sell-off and outperform the ETF. However, the ETF captured more of the snap back, having remained fully invested even at the lows and therefore participating to the maximum extent in the rally.

As shown in **Figure 5**, for Fund A, the outperformance lasted just 12 days, peaking at 8.5% before reversing back to flat. Fund B managed the draw-down more effectively, with outperformance peaking at 11.8% before giving back half of this by late April.

Since the beginning of the market recovery on 21 April, the three funds have returned to their historical patterns of performance, as can be seen in **Figure 6**. The correlations of Fund A and Fund B versus the ETF have been high (R^2 of 92% and 76% respectively) and the Invesco AT1 ETF has outperformed on both an absolute and risk-adjusted basis.

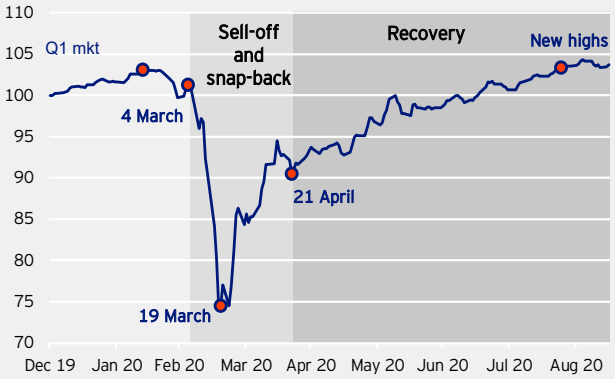
Active management versus the "Wisdom of Crowds"

Whether it is better for a portfolio manager or the end investor (who may also be a portfolio manager) to decide when to reduce exposure is largely one of individual preference.

We can, however, compare how each approach performed. For the active funds the impact is already reflected in the NAV as the decreased market participation during the crisis period is what drives the fund's performance. For the ETF, we can look at changes in the daily shares outstanding, which reflect inflows and outflows from the fund. Changes in the shares outstanding remove the impact of market moves and illustrate how the aggregate community of AT1 ETF investors adjusted their collective exposures.

We find that holdings in the Invesco AT1 ETF peaked on 23 January, three weeks before the market high. By the time the sharp sell-off began on 5 March, 28% of the fund's shares had been redeemed. Outflows peaked at 36% on 9 March, eight days before the market lows with prices still just 6% off peak levels. New inflows were quick to materialise with the first inflows coming just three days after the 19 March lows. Shares outstanding were back to 84% of peak level by the end of the snap-back period and fully recovered by 14 July.

Figure 4 - Timeline of a market crisis



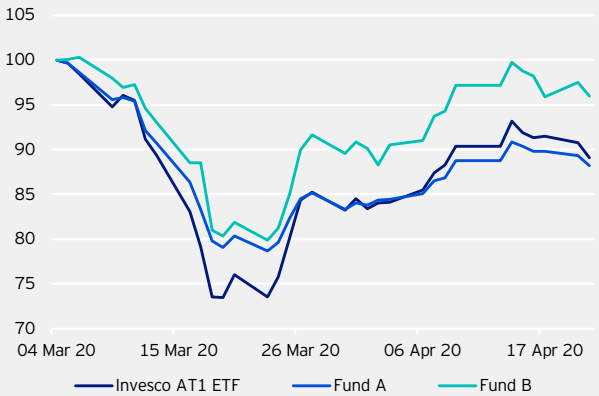
Source: Bloomberg. AT1 market is represented by the iBoxx USD Contingent Convertible Liquid Developed Market AT1 (8/5% Issuer Cap) Total. "Sell-off", "snap-back" and "recovery" ranges are for descriptive purposes only.

We can use this data to construct a hypothetical "wisdom of crowds" AT1 portfolio. The portfolio consists of a 100% allocation to the ETF at the peak of AT1 ETF holdings on 23 January. We then match each subsequent inflow or outflow from the ETF by a proportionate allocation into cash. This process continues until 14 July when the portfolio is back to a full 100% allocation to the ETF.

To be clear, this portfolio does not represent any particular individual's holdings, but rather an average across all investors in the Invesco AT1 ETF. It also assumes that outflows from the AT1 ETF are reallocated into cash. In practice, investors' use of assets raised from redemptions cannot be known and could have been reinvested into even riskier assets. Nonetheless, it provides an interesting reference against which to compare the active funds' performance.

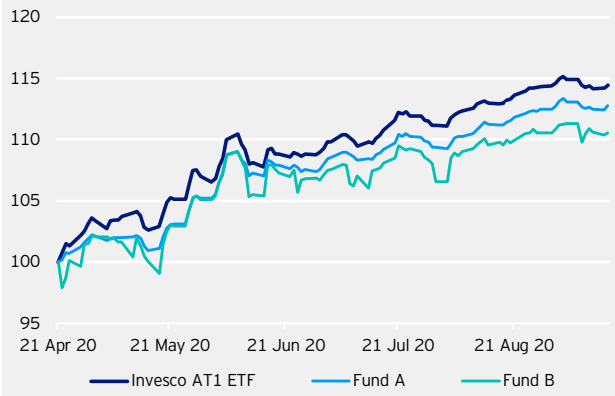
The results are as shown on the next page, in **Figure 7**. The AT1 "Wisdom of Crowds" portfolio had the smallest absolute drawdown of the four strategies by more than 2%. Versus Fund A, the portfolio outperformed by 6.7% with nearly identical volatility. Versus Fund B, the total return was within 0.8% (having previously surpassed it) with realised volatility that was lower by 7.1%.

Figure 5 - Relative performance in the sell-off and snap-back (4 March - 21 April)



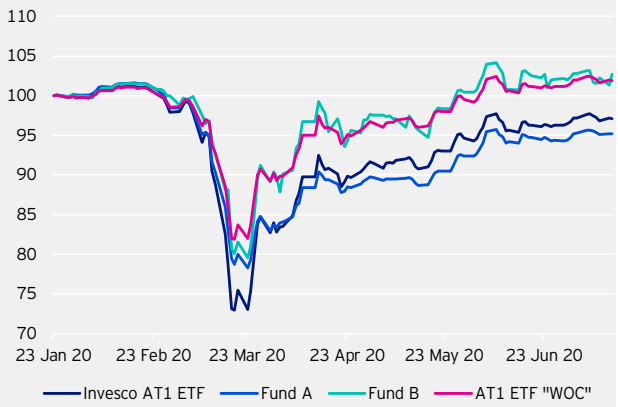
Past performance is not a guide to future returns. Source: Bloomberg 4 March to 21 April 2020. "Invesco AT1 ETF" is the Invesco AT1 Capital Bond UCITS ETF. Details of Fund A and Fund B are provided in Appendix A.

Figure 6 - Relative performance in the recovery period (21 April - 15 September)



Past performance is not a guide to future returns. Source: Bloomberg 21 April to 15 September 2020. "Invesco AT1 ETF" is the Invesco AT1 Capital Bond UCITS ETF. Details of Fund A and Fund B are provided in Appendix A.

Figure 7 - The AT1 ETF "Wisdom of Crowds" Portfolio



	Max Drawdown	Total Return	Annualised volatility
Invesco AT1 ETF	-27.0%	-2.9%	25.7%
Fund A	-21.7%	-4.8%	17.4%
Fund B	-20.4%	2.7%	24.7%
AT1 ETF "WOC"	-18.1%	1.9%	17.6%

Past performance is not a guide to future returns. Source: Bloomberg from 23 Jan 2020 to 14 July 2020. "Invesco AT1 ETF" is the Invesco AT1 Capital Bond UCITS ETF. Details of Fund A and Fund B are provided in Appendix A. "AT1 ETF Wisdom of Crowds" is the combined ETF and cash portfolio as described. Returns normalised as of start of period.

Conclusion

Since the first AT1 bonds were issued in 2013, this regulatory-driven asset class has grown rapidly. In the early years, when issuance was high and familiarity was low, inefficiencies were more plentiful for active managers with the right knowledge and skills to exploit.

There is increasing evidence that the market for AT1 bonds is best viewed as a single beta exposure – an ingredient that investors can add to their portfolios for its specific risk and return characteristics. The role of active management thus shifts from security selection within the AT1 bond market, to the portfolio-level allocations decisions to the AT1 market as a whole.

Since coming to market in 2018, the Invesco AT1 ETF has demonstrated its value as an alternative for investors looking for AT1 bond exposure. Performance has been consistent with, or superior to, that of the leading actively managed funds on both an absolute and risk-adjusted basis. By focusing solely on the more liquid USD AT1 bond market, the ETF is simpler for investors to analyse and understand, and at the same time, easier for market-makers to replicate, which greatly enhances secondary market liquidity.

With $719m AUM, over two years' track record of stable index replication and orderly trading, and priced at just 0.39%, the Invesco AT1 Capital Bond UCITS ETF provides investors with an effective tool with which to gain exposure to this unique asset class.

Endnotes

1. More information on bank capital available at: www.bis.org/fsi/fsisummaries/defcap_b3.htm
2. The trigger is the ratio of Common Equity Tier-1 Capital (CET1) to risk-weighted assets (RWA) falling below 5.125. Bonds may be written down partially or completely or may convert to equity.
3. Bloomberg, based on the Bloomberg Barclays Global Contingent Capital TR Index
4. Bloomberg. Correlation calculated versus the Bloomberg Barclays Contingent Capital USD Total Return Index (BCCGTRUU). Due to significant mean-reverting noise between Fund B and the index, correlation is calculated using a 5d moving average of all three price series.
5. The risk-adjusted returns for the simulated ETF and Fund A were tied in 2018.
6. Non-UCITS active funds (e.g. long / short hedge funds) can use large amounts of leverage to exploit small mispricings across relatively similar securities (e.g. capital structure arbitrage).
7. iBoxx USD Contingent Convertible Liquid Developed Market AT1 (8/5% Issuer Cap) Total Return Index.

Appendix A - Details of Fund A and Fund B

The details of the active funds used in the preceding analysis are provided below.

It is important to clarify that, despite many investors' perceptions of these funds as "AT1 funds", this is not an accurate description of either fund's objectives. Both invest broadly in financial sector credit, which includes significant holdings in AT1 bonds, but also many other forms of senior and subordinated debt, hybrid securities, preferred shares and derivatives. Neither fund has as its objective to track or outperform a benchmark for the AT1 market or financial sector credit.

Fund A	
Fund Name	**PIMCO GIS Capital Securities Fund**
Launch date	July 2013
AUM	$7.2bn (Source: 30 September 2020 fund factsheet)
AT1 holdings (%)	54% (Source: 30 September 2020 fund factsheet)
Institutional shareclass (USD)	Ticker: PIMCINA Fee: 0.79%
Retail shareclass (USD)	Ticker: PIMCSRI Fee: 1.69%
Website	www.pimco.co.uk

Fund B	
Fund Name	**Algebris Financial Credit Fund**
Launch date	September 2012 – Note that this predates the issuance of the first AT1 bond.
AUM	€5.8bn (Source: 30 September 2020 fund factsheet)
AT1 holdings (%)	63% (Source: 30 September 2020 fund factsheet)
Institutional shareclass (USD)	Ticker: ALGFIUS Fee: 0.50% + 10% performance fee
Retail shareclass (USD)	Ticker: ALGRUSD Fee: 1.20% + 10% performance fee and 3% load
Website	www.algebris.com

All historical performance and correlation data sourced from Bloomberg using the lowest-fee USD institutional share class, for both funds.

Appendix B

The AT1 bonds used in the correlation analysis in **Figure 3** were the following.

Pairwise correlation is computed over a rolling 130-day look-back period. Historical price data taken from Bloomberg using BVAL pricing source.

Issuer	Security ID	Equity ticker for issuing entity
AUST & NZ BANKING GRP/UK	LW3759302 Corp	ANZ AU
BANCO BILBAO VIZCAYA ARG	AP9361290 Corp	BBVA SM
BARCLAYS PLC	QZ3177313 Corp	BARC LN
BNP PARIBAS	UV5159024 Corp	BNP FP
CREDIT AGRICOLE SA	EK0315516 Corp	ACA FP
CREDIT SUISSE GROUP AG	EK3302669 Corp	CSGN SW
DANSKE BANK A/S	AM9264657 Corp	DANSKE DC
DEUTSCHE BANK AG	EK5892527 Corp	DBK GR
DNB BANK ASA	QZ8551595 Corp	DNB NO
HSBC HOLDINGS PLC	EK4786241 Corp	HSBA LN
ING GROEP NV	EK8513559 Corp	INGA NA
MACQUARIE BANK LONDON	AM692223 Corp	MQG AU
LLOYDS BANKING GROUP PLC	EK1616904 Corp	LLOY LN
NATWEST GROUP PLC	UV4500798 Corp	NWG LN
SOCIETE GENERALE	EJ9873484 Corp	GLE FP
STANDARD CHARTERED PLC	QZ2259237 Corp	STAN LN
SVENSKA HANDELSBANKEN AB	EK7554448 Corp	SHBA SS
UBS GROUP AG	AQ9022791 Corp	UBSG SW
UNICREDIT SPA	EK1429340 Corp	UCG IM
WESTPAC BANKING CORP NZ	AP0791792 Corp	WBC AU

Rolling performance

	Sep 19 - Sep 20	Sep 18 - Sep 19	Sep 17 - Sep 18	Sep 16 - Sep 17	Sep 15 - Sep 16	Dec 18 - Dec 19	Dec 16 - Dec 19 (ann.)
Fund A (PIMCO GIS Capital Securities Fund)	3.84%	9.52%	0.87%	11.12%	5.53%	17.38%	7.65%
Fund B (Algebris Financial Credit Fund)	11.43%	10.24%	1.74%	12.98%	7.42%	19.30%	8.55%
Simulated ETF	6.32%	12.17%	-0.44%	15.57%	10.27%	19.52%	9.41%
Invesco AT1 Capital Bond UCITS ETF	6.37%	10.68%	-	-	-	18.79%	-
iBoxx USD Contingent Convertible Liquid Developed Market AT1 (8/5% Issuer Cap T	7.12%	11.16%	0.59%	17.06%	5.87%	19.13%	9.68%
Bloomberg Barclays Global Contingent Capital TR Index Value Unhedged USD	6.82%	12.67%	0.06%	16.07%	10.77%	20.02%	9.91%

Past performance (actual or simulated) is not a guide to future returns. Source: Bloomberg, 30 Sep 2020. Fund A is the institutional share class for the PIMCO GIS Capital Securities Fund PIMCINA (ISIN: IE00B6VH4D24). Fund B is the institutional share class for the Algebris UCITS Funds plc - Algebris Financial Credit Fund ALGFIUS (ISIN: IE00BK017B22). Simulated ETF (reference in Figure 1) return is equal to the Bloomberg Barclays Contingent Capital USD Total Return Index less a daily-accrued management fee of 0.50% p.a

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Investment Risks

Value fluctuation: The value of investments, and any income from them, will fluctuate. This may partly be the result of changes in exchange rates. Investors may not get back the full amount invested.

Invesco AT1 Capital Bond UCITS ETF

Contingent Convertible Bonds: This fund invests in contingent convertible bonds, a type of corporate debt security that may be converted into equity or forced to suffer a write down of principal upon the occurrence of a pre-determined event. If this occurs, the Fund could suffer losses. Other notable risks of these bonds include liquidity and default risk.

Debt instruments: Debt instruments are exposed to credit risk which relates to the ability of the borrower to repay the interest and capital on the redemption date.

Interest rates: Changes in interest rates will result in fluctuations in the value of the fund.

Securities lending: The Fund may be exposed to the risk of the borrower defaulting on its obligation to return the securities at the end of the loan period and of being unable to sell the collateral provided to it if the borrower defaults.

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Data as at 30 Sep 2020, unless otherwise stated.

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Any calculations and charts set out herein are indicative only, make certain assumptions and no guarantee is given that future performance or results will reflect the information herein.

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