



THE  
**Frontier Line**

Thought leadership and insights from Frontier Advisors

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**Hedging against unexpected  
inflation rises**

# ▶ Frontier Advisors

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# Executive summary

Any portfolio which has a return objective expressed as a percentage return above inflation (proxied by the consumer price index (CPI) rate) will be exposed to the difference between predicted and observed CPI over the relevant time horizon. A realised CPI which turns out to be greater than the originally forecasted CPI rate will reduce the chance of the portfolio meeting its return objective. Hedging pure inflation risk has applicability for liability driven investors such as defined benefit plans and insurance investment portfolios which are seeking to manage assets to meet future liabilities. This risk is also relevant for more defensive portfolios (e.g. conservative superannuation portfolio) since these portfolios likely have higher allocations to cash and bonds, two asset classes with very low forecasted rates of returns for the medium-term time horizon. Investors can hedge this risk by “locking in” the CPI rate for a future time horizon.

In this paper, we explain the different methods available to investors to implement this inflation hedge specifically buying Australian inflation linked bonds (ILBs) and inflation linked swaps. The very low relative liquidity of the local government inflation linked bond market needs to be considered although, with a large amount of Australian Commonwealth Government debt issuance required in the next few years, it is possible that inflation linked bond issuance could grow.

The decision to implement this inflation hedge is investor and portfolio specific. It will depend on the following:

- Capital market views about the potential for realised inflation to be higher than forecast;
- The weight of the portfolio to asset classes which could have a positive effect from rising inflation (e.g. equities or real assets);
- The weight in the portfolio to defensive asset classes like cash and bonds which have very low forecasted returns.

The main body of this paper includes background to the inflation market conditions, the issues with realised inflation being higher than expected inflation, the approach to hedge inflation and broader portfolio considerations to factor in asset classes which have sensitivity to inflation. We then go into more detail for different sections within the main body of this paper.

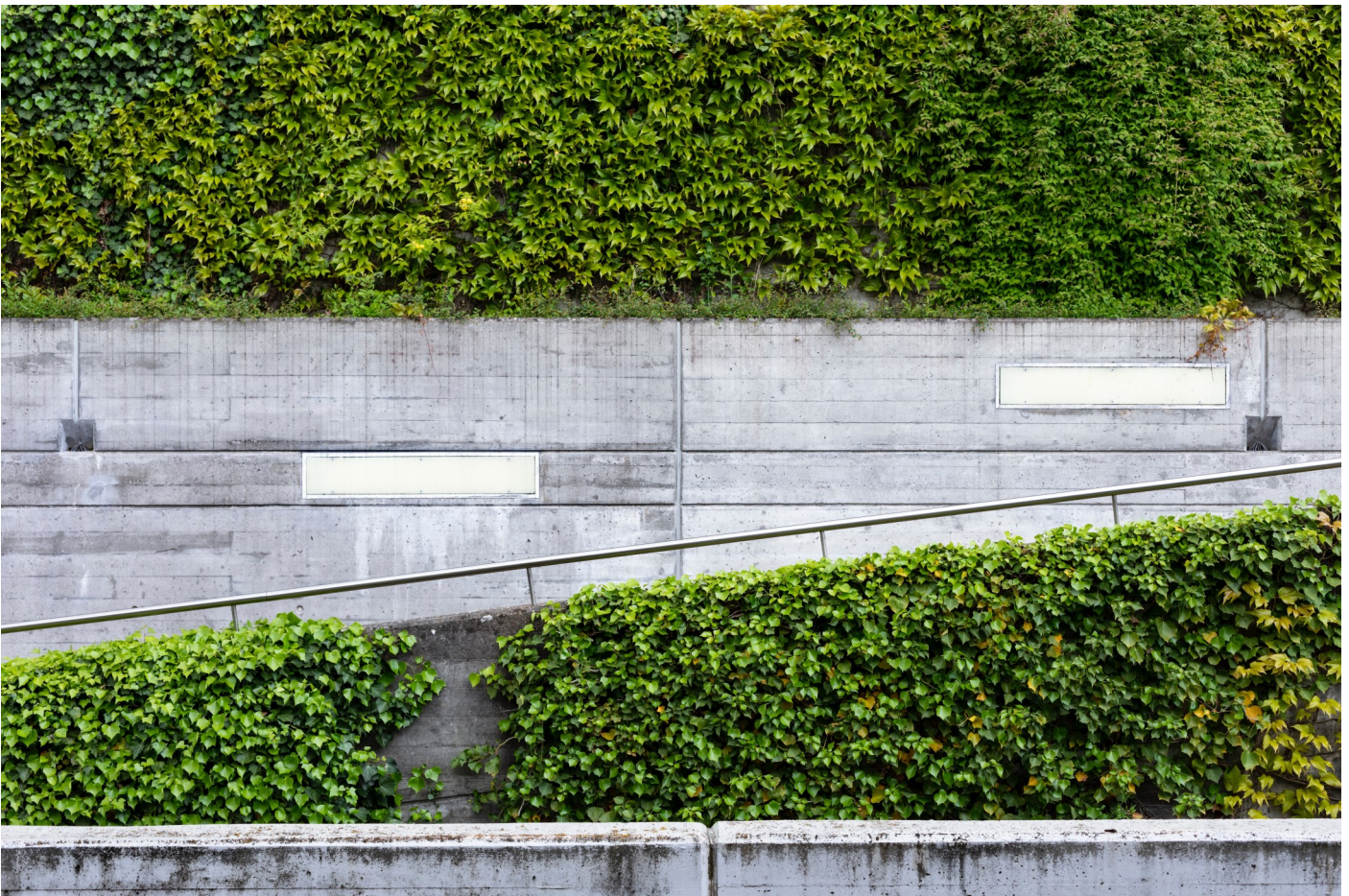
While this paper covers options and concepts, it is important to consider these and the various inflation exposures in the context of each investor’s total portfolio. For these various options to gain explicit inflation exposure and in thinking about each investor’s unique circumstances, Frontier works with our incumbent clients and can work with institutional investors to tailor any inflation program to suit your specific circumstances.



# Setting the scene

For the past several decades the global economy has been experiencing a powerful combination of steadily increasing global growth and declining inflation. However, the global economy is now under enormous pressure from the negative economic fallout from COVID-19, which has seen a record amount of fiscal and monetary stimulus by governments and central banks to stimulate the global economy.

Investors are now facing an environment where asset returns are compressed, combined with record levels of money supply and liquidity pumped into the global financial system as a result of fiscal and monetary stimulus. Both factors can lead to meaningful inflationary pressures over the medium term. These current conditions could see investors considering strategies that will provide protection from the risk of inflationary pressures re-emerging.





# The risks from unexpectedly higher inflation

In the current expected low return environment, combined with record low interest rates, the difference between the realised inflation (as proxied by the Consumer Price Index (CPI)) and forecast inflation rate is an important consideration when looking at portfolio return objectives. Rising inflation outcomes can have a material impact on portfolio returns, as most portfolio return objectives are generally expressed as CPI plus “x”% return for most multi asset portfolios.

This is particularly important for investors with inflation linked return objectives such as superannuation funds, liability driven investors such as insurance companies and defined benefit schemes with inflation linked liabilities.

Each portfolio’s return objective is usually based on inflation (as measured by the CPI). As part of the portfolio construction process, a forecast view of inflation will be used to assess the probability of the portfolio achieving the return objective over a particular time horizon. The risk for the portfolio is that realised inflation is higher than the original forecast inflation over the relevant period.

For example, suppose a portfolio has a return objective of CPI + 3% p.a. and the forecast inflation rate is 2% over the next 10 years meaning the portfolio’s absolute return objective is 5% p.a. The asset allocation mix as part of the portfolio construction process will be based on achieving this return. Suppose that the realised inflation rate over the same period is 3% p.a. instead of the forecasted 2% p.a. This means that the absolute return which is needed to meet the portfolio’s return objective is 6% p.a. instead of 5% p.a. In a forecast lower return world, generating an additional 1% p.a. to offset a higher realised inflation outcome could be difficult and the probability of meeting the return objective is reduced. This risk of realised inflation being higher than the original forecast inflation rate can be hedged.

This paper focuses on how investors can implement a trade structure which would result in “fixing” the CPI rate over a future period across a portion of the overall portfolio.



# How to hedge inflation

In this paper, we provide background to the different methods which an investor can use to reduce the loss potential from realised CPI being higher than the forecast CPI over a pre-specified period of time. There are two methods discussed:

1. Buying ILBs and hedging out the interest rate duration risk to leave the investor with exposure to pure realised inflation;
2. Buying inflation swaps whereby the investor receives the realised rate of inflation in exchange for paying a pre-agreed fixed rate of inflation.

It should be noted that ILBs not only have sensitivity to inflation (both forecast inflation as well as realised inflation) but also to interest rates. To source exposure to inflation on its own, then an investor can hedge the interest rate risk. When hedging out the interest rate risk, there are three alternatives that can be implemented across the portfolio which will leave the desired exposure to pure inflation risk. These alternatives are selling nominal Australian government bonds, selling ASX bond futures or paying interest rate swaps. Implementation can either be performed using an investment bank, which will structure the trade, or by using a derivatives overlay manager to implement both sides of the trade. Another alternative is to enter into a bespoke mandate with a fund manager.

The size of the inflation linked bond market in Australia is not large and so an alternative for investors to consider is to implement this trade using international inflation linked bonds (e.g. US Treasury Inflation Linked bonds or TIPs). The benefit is the ability to trade a larger transaction size. The key risk, though, is different outcomes for inflation in Australia relative to overseas and therefore using international inflation markets as a hedge to Australian inflation risk can create cross market basis risk that needs to be managed and could cause undesired negative performance. If liquidity is an issue, then one could consider to use a mix of Australian and international inflation instruments.

## Wider portfolio considerations

While this paper focuses on how an investor can implement a pure inflation hedge using the methods above, we note that inflation sensitivity is present in many asset classes (real assets, commodities, ILBs and equities) and so an investor could consider these as either complements or alternatives to the above methods. Investors could consider inflation sensitive real assets such as commodities (gold) or real estate to provide some inflation protection to their portfolios. Real assets have historically performed well in inflationary environments as the value of the real asset generally will move higher when inflation rises. For example, commodities such as gold perform well in inflationary environments as fiat currencies generally devalue during periods of rising inflation and therefore gold is used as a contra-currency. However, real assets such as commodities or real estate will also be subject to other supply and demand factors which introduces an imperfect relationship with inflation. This basis risk should be considered when determining the method of reducing the risk from inflation. In addition, sizing of the inflation hedge should factor in the potential for other parts of the total portfolio to perform better than expected in a higher inflation environment which will help to bridge the gap in forecast to realised inflation.

## Target portfolio types

The approach to hedge inflation risk is most applicable to investor portfolios with larger allocations to cash or fixed interest given the very low forecast returns for these asset classes. In the superannuation space, this would be Balanced or Conservative investment options. Hedging pure inflation risk also has applicability for other investor types which are seeking to manage assets to meet future liabilities. These liability driven investors include defined benefit plans or insurance companies. Their risk from inflation is somewhat different to defined contribution portfolios in that the inflation is more of a factor on the present value of future liabilities. Increasing inflation leads to increased future liabilities and so this risk factor needs to be managed. Ultimately these investors will care more about how assets move relative to liabilities and so consideration of the impact of inflation is of critical importance

# Summary of access methods

Later in this paper, we include an in-depth discussion around the different access methods for gaining exposure to inflation. Table 1 summarises the pros and cons of each method.

Table 1: Different approaches to creating a hedge of pure inflation risk

Strategy	Pros	Cons
<b>Treasury Index Bonds</b>	<ul style="list-style-type: none"> <li>• Face value of the bond is adjusted with CPI movements</li> <li>• AOFM<sup>1</sup> to provide ongoing supply</li> </ul>	<ul style="list-style-type: none"> <li>• Need to hedge duration risk</li> <li>• Less active market, liquidity concerns</li> </ul>
<b>Inflation Linked swaps</b>	<ul style="list-style-type: none"> <li>• No duration risk</li> <li>• Receive the CPI index return over the life of the swap</li> <li>• No upfront principal exchange</li> <li>• Can be customised to investor's preferred maturity date and notional</li> </ul>	<ul style="list-style-type: none"> <li>• Less active market, liquidity concerns</li> <li>• Counterparty risk</li> </ul>
<b>International markets</b>	<ul style="list-style-type: none"> <li>• Very active market and deep liquidity</li> <li>• Exposure to global inflation movements</li> </ul>	<ul style="list-style-type: none"> <li>• Not exposed to domestic inflation movements</li> <li>• Will create cross market basis risk</li> </ul>

Source: Frontier

<sup>1</sup>AOFM stands for the Australian Office of Financial Management. One role of the AOFM is to issue inflation linked bonds to the market on behalf of the Australian Commonwealth Government.

# Summary of hedging strategies for duration risk management

As previously noted, ILBs also have exposure to interest rate duration<sup>2</sup> risk and therefore the value will move with the direction of interest rates as well as inflation expectations. This is the added benefit of ILBs over nominal bonds, as the investor will gain downside protection through interest rate duration as well as protection from rising inflation, adding portfolio flexibility through different inflation cycles.

The interest rate duration risk will need to be managed according to the investor's risk profile and overall portfolio exposure. To hedge the interest rate duration risk, there are three alternatives that can be implemented across the portfolio which will leave the desired exposure to pure inflation risk.

The three alternatives are very liquid markets; however, some do create additional basis risk which would need ongoing management.

Later in this paper, we include an in-depth discussion around the hedging alternatives to manage the interest rate duration risk from buying an ILB. Table 2 includes the different duration hedging methods (this assumes the investor already owns an ILB and hence will derive actual inflation but the investor will wish to hedge out the interest rate risk so that only the inflation exposure remains) and their respective pros and cons.

Table 2: Different approaches to hedging duration risk from ILBs

	Pros	Cons
<b>Sell Nominal Bonds (ACGB)</b>	<ul style="list-style-type: none"> <li>• Deep and liquid market</li> <li>• Effectively hedge the interest rate duration risk</li> <li>• Cashflow neutral</li> </ul>	<ul style="list-style-type: none"> <li>• Need to own the nominal bond before selling or source the bond via repo</li> <li>• Need to engage with external bank to execute without an appropriate internal trading team</li> </ul>
<b>Sell ASX bond futures</b>	<ul style="list-style-type: none"> <li>• Deep and liquid market</li> <li>• Effectively hedge the interest rate duration risk</li> </ul>	<ul style="list-style-type: none"> <li>• Bond EFP basis risk needs to be managed</li> <li>• Require Internal trading team to manage futures roll risk</li> <li>• Only 3yr or 10yr maturities which can create curve risk</li> </ul>
<b>Pay Interest Rate Swap</b>	<ul style="list-style-type: none"> <li>• Cheaper to pay interest rate swap than sell the bond future</li> <li>• Deep and liquid market</li> <li>• Effectively hedge the interest rate duration risk</li> <li>• Can be tailored to match the TIB exactly in terms of notional and maturity</li> </ul>	<ul style="list-style-type: none"> <li>• Require internal trading team to manage swap basis risk</li> <li>• Need to be setup for OTC derivatives</li> </ul>

Source: Frontier

<sup>2</sup>Duration risk is when the value of the fixed interest investment changes with movement in interest rates. I.e. When interest rates rise, the future cash flows become less valuable today and the price of the bond decreases.



# Broader portfolio risk considerations

Portfolio construction will depend on the underlying risk mandate of the investor. The investor will need to appreciate that adding an allocation to pure realised inflation exposure (either via ILBs duration hedged or an inflation linked swap) may add to portfolio volatility and other risks over the short term. The reason for this is that a slowdown in global growth can lead to lower inflation expectations, which would see pure realised inflation exposure strategies underperform during times of severe market stress (e.g. March 2020).

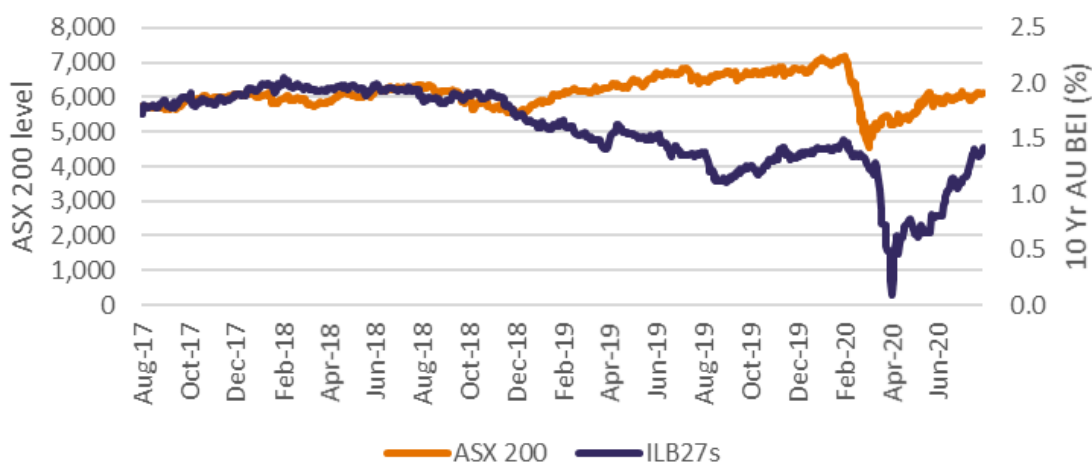
For investors that are sensitive to peer comparison or are slightly more risk adverse (such as conservative superannuation funds), it is important to understand that whilst pure realised inflation exposure will help meet long term return objectives, it may also add drawdown volatility to a portfolio during times of severe market stress. This is an important consideration when constructing a portfolio, and therefore the investor may decide that an ILB is a more appropriate alternative to gaining inflation exposure whilst also maintaining the downside protection benefit of interest rate duration exposure within fixed income assets.

For this reason, the investor may choose to leave a portion of the ILB interest rate duration exposure unhedged, rather than hedging out the entire interest rate duration risk with nominal bonds to leave the investor with exposure to pure realised inflation.

For a more defensive approach, investors can leave a certain amount of interest rate exposure from the long ILB position which will help provide downside protection against the investor's equity holdings in times of market stress.

Chart 1 shows that, when the ASX200 suffered large drawdowns in March this year the 10yr Australian inflation breakeven<sup>3</sup> rate also fell aggressively as inflation expectations were significantly impacted from the unknown global growth impact from COVID-19, highlighting the high correlation breakeven rates have to risk assets (it is important to note that ILBs also suffered from the lack of liquidity in all asset classes during March which exaggerated the selloff). However, with the global economy starting to re-open as restrictions ease around the world, combined with the record amount of fiscal and monetary stimulus by governments and central banks, this has seen inflation breakevens start to recover to pre COVID-19 levels; this reflects the market beginning to price in a higher probability of a return to inflationary pressures over the longer term.

Chart 1: Performance of Australian breakeven inflation rates against ASX 200 during COVID-19 stress period



Source: Bloomberg, Frontier

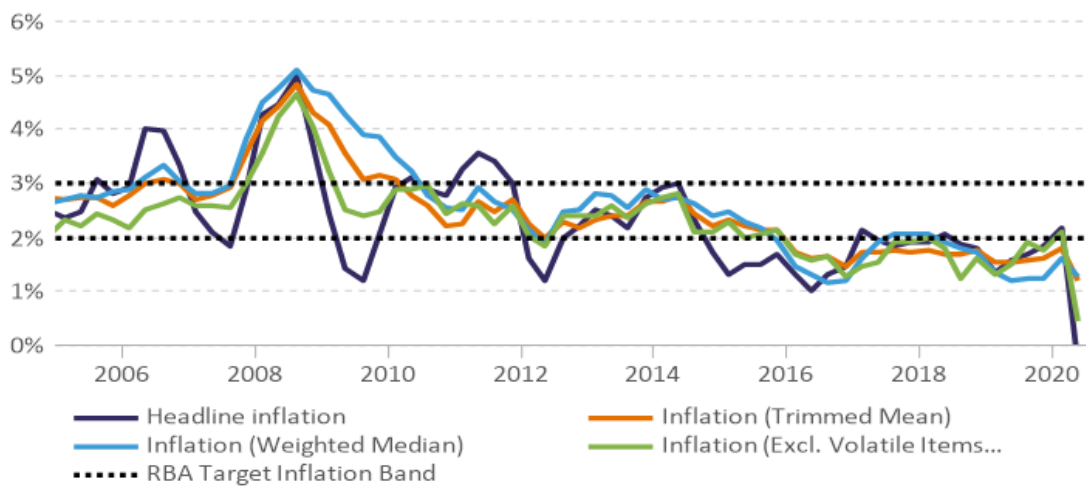
<sup>3</sup>Breakeven rate is a broad market measure of inflation expectations, which is calculated from the difference in yield between nominal bonds and inflation indexed bonds.

# Inflation environment

Global inflation has been on steady decline for the past several decades due to numerous factors, including digitisation, robotics, ageing population demographics and increasing debt levels. The negative impact to global growth from the impact of COVID-19, saw inflationary pressures and inflation risk premia collapse to record lows.

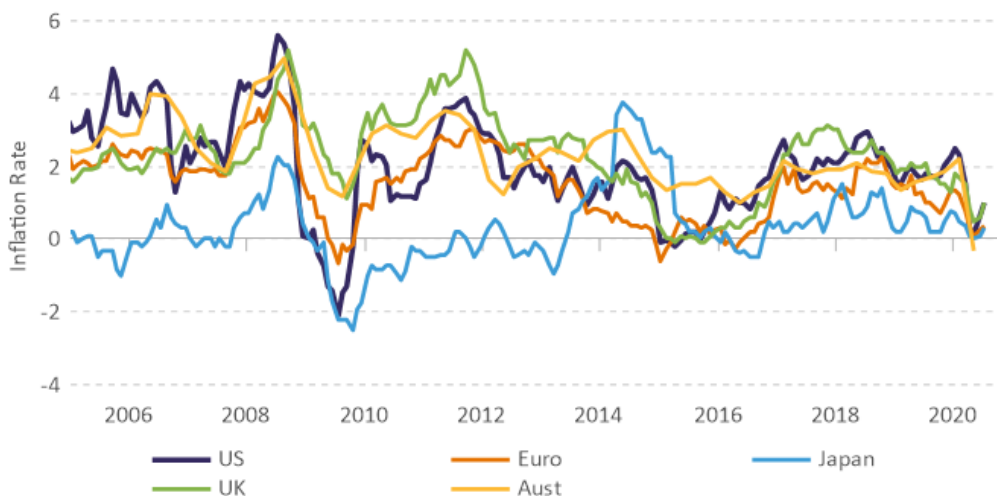
However, with the global economy starting to re-open as restrictions ease around the world, combined with the record amount of fiscal and monetary stimulus by governments and central banks, this has seen inflation breakevens start to recover to pre COVID-19 levels; this reflects the market beginning to price in a higher probability of a return to inflationary pressures over the longer term.

Chart 2: Australian inflation measures



Source: Refinitiv Datastream

Chart 3: Global headline inflation

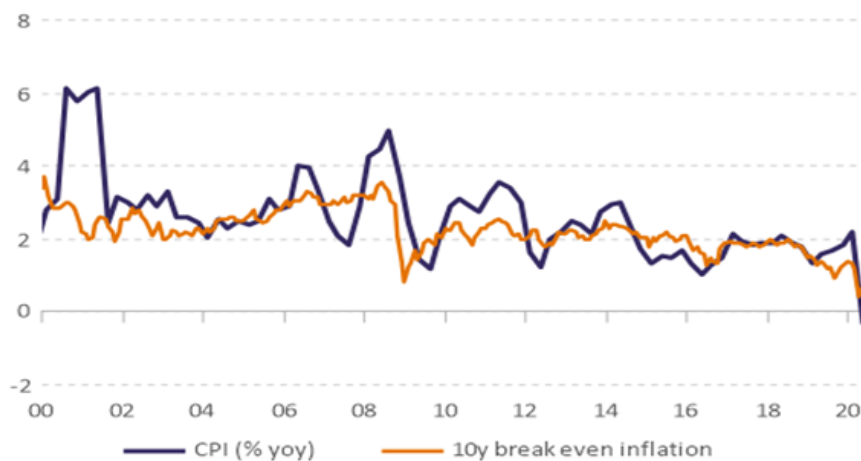


Source: Refinitiv Datastream  
Source: Refinitiv Datastream

As background, a key broad market measure of inflation expectations is called the 'breakeven' rate, which is calculated from the difference in yield between nominal bonds and inflation indexed bonds. Yields on inflation indexed bonds are referred to as the 'real yield' due to the face value of the inflation indexed bonds being indexed to CPI each year. Therefore, the yield difference in nominal bonds and the real yield of inflation index bonds is the expected rate of inflation, from all market participants, over the prevailing life of two respective bonds over the same term. Generally, this is often examined over the next 10 years. It is this difference which is referred to as the 'breakeven' rate. This is because it is the rate of **actual** inflation required such that the return of the inflation linked bond will equate to the return of the nominal bond (which has inherent within its yield the **expected level of inflation**).

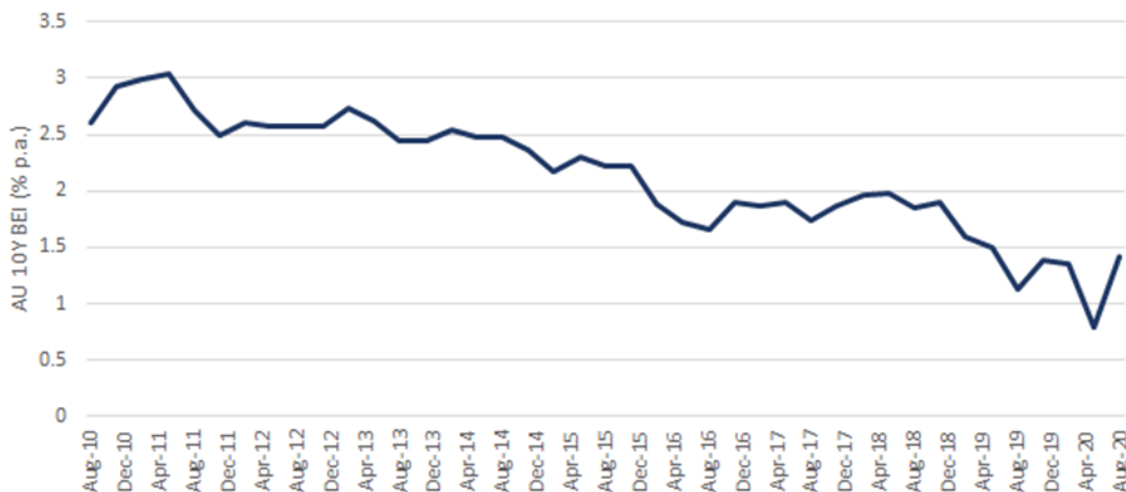
The Australian 10-year breakeven rate has moved from a low of 0.26% in March 2020 to 1.30% as at the end of July (as shown in chart 5 below). The US 10-year breakeven rate has moved to 1.55% from a low of 0.55% and Germany's 10-year breakeven has moved from 0.24% to 0.70%. The recent moves in global breakeven rates shows the opportunity that exists for investors that are looking to capture inflationary risk premia for their portfolios in the medium to long term horizon. Even though the sharp bounce back in breakeven rates from the lows in March may suggest further upside inflation risk has decreased in the short term, the future implied inflation rates are still suggesting there is a material risk of higher inflation over the medium to long term.

Chart 4: Australia CPI and breakeven inflation



Source: Refinitiv Datastream

Chart 5: AU breakeven inflation rate over the last 10 years and during the COVID-19 period



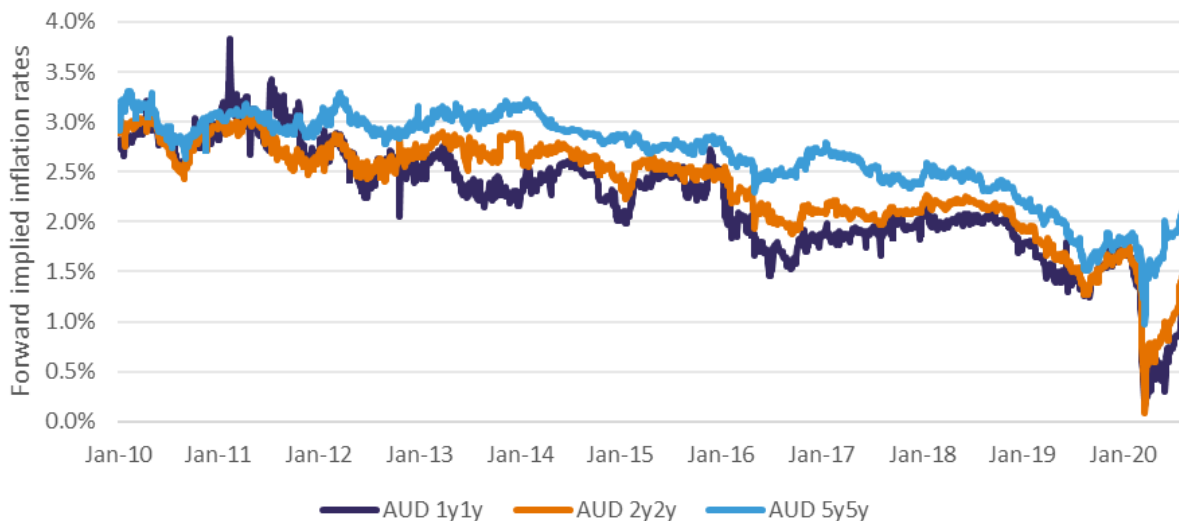
Source: Bloomberg, Frontier

The 5y5y forward inflation swap rate is a market quote convention and shows the average expected 5 year inflation swap rate starting in 5 years' time (i.e. the expected 5 year inflation rate in 2025). This is another effective tool to see what the market is pricing into future implied inflation rates. The 5y5y forward inflation swap rate is commonly used by central banks as a broad inflation measure on how the market interprets the long-term impact of its policies on inflation expectations.

Using pricing as at 30 August 2020, the forward inflation swap curve reflects the general consensus for inflationary pressures to remain low in the short term, and for a recovery of inflationary risk premia over the medium term with 5y5y forward inflation swap at 2.01%, at the bottom of the RBA target band of 2-3%.

However, as per Chart 6, the current levels of the forward implied inflation swap rates (1y1y, 2y2y and 5y5y) are at 10yr lows and therefore asset classes with a strong correlation with inflation could be vulnerable to future inflationary shocks going forward and is a key consideration for multi asset portfolio construction. When inflation rises, the tail risk volatility of nominal bonds increases which breaks down the negative correlation of bonds and equity asset classes which therefore increases the volatility of balanced multi asset portfolios which include bonds and equities.

Chart 6: Australian forward implied inflation swap rates



Source: Bloomberg, Frontier



# Treasury Indexed Bonds

Treasury Indexed Bonds (TIBs) are medium to long-term securities issued by the Australian Government where the capital value of the bond is adjusted for movements in the CPI, receiving interest quarterly on the adjusted capital value. Investors will receive at maturity the adjusted capital value of the bond which has been adjusted for the CPI movements over the life of the bond. For example, if CPI averages 2% p.a. over a 10 year period, then the capital value of the bond will be adjusted from the issued price of \$100 to \$121 (i.e.  $100 * (1.02)^{10}$ ).

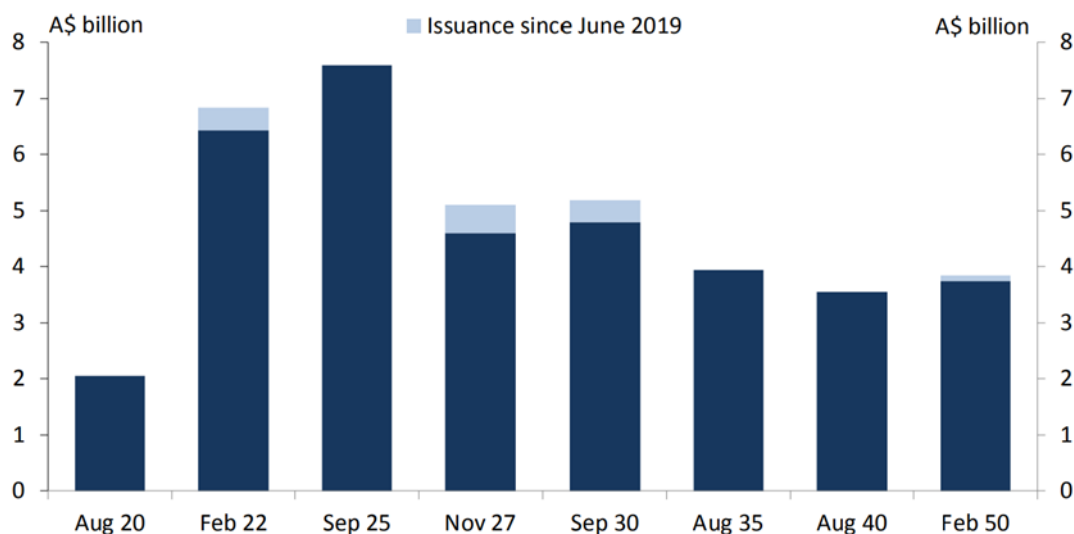
TIBs are issued by the AOFM, with currently AUD \$39 billion outstanding across eight different maturities, ranging from 2022 to 2050.

The AOFM conducts fortnightly auctions to provide support and liquidity to the market, with issuance between AUD \$100-\$200 million per fortnight combining for \$2-\$2.5bn annually.

Given the increase in the Australian Government deficit this year due to the fiscal stimulus response to support the economy from the impact of COVID-19, TIBs issuance is expected increase, along with nominal Australian Commonwealth Government Bonds (ACGBs). This will help provide additional liquidity to the market. Chart 7 shows the outstanding TIBs on issue.

Chart 7: Treasury Indexed Bonds on issue

Amount shown is the face value unadjusted for changes in the CPI adjusted capital value of the bond.



Note: The AOFM has recognized the liquidity challenges facing the TIBs market over the past year in particular and will continue to support this market. This means that prevailing market conditions and appropriate tender volumes will remain important determinants of issuance decisions. The importance of regular issuance supply is acknowledged.

Source: AOFM as at 27 May 2020

TIBs returns are directly correlated with inflation outcomes in all economic conditions. Therefore, to position for higher inflation expectations, having an allocation to TIBs will provide the most direct exposure to benefit or protect the portfolio from an environment of rising inflation. The key reason to be allocating a portion of the fixed income or cash allocation of an investor's portfolio to buying TIBs is to provide protection from higher inflation over the medium term. The medium-term return from owning TIBs will be impacted from two key sources, inflation and interest rates, and therefore the investor's return will have a specific two-pronged benefit from an allocation to stable defensive fixed income return and inflation protection.

Working through an example of how a Treasury Index Bond works, let's assume the following market pricing (as 30 August 2020):

- 10yr Treasury Index Bond yield real yield -0.38%;
- 10yr ACGB nominal yield 1.01%;
- The implied inflation breakeven yield is 1.39% (BEI) ( 1.01% + 0.38%)

TIB's pay a fixed coupon on the inflation adjusted capital value of the bond, and therefore an investor buying a TIB will benefit if the actual inflation outcome is higher than the implied breakeven rate of 1.39% over the life of the bond. The capital value of the TIB is adjusted higher for the difference between actual inflation and the implied BEI.

Conversely, if the actual inflation outcome is lower than the 1.39% BEI then the investor will be subject to earning less from the coupons as the face value of the TIB will be adjusted lower.

This is outlined in Table 3.

## How to access TIBs

Investors can access TIBs when they are issued or on the secondary trading market. Primary issued TIBs are purchased by brokers (i.e. usually investment banks) or local or global fund managers. There are broadly five key banks who are active purchasers of primary issues.

Table 3: Hypothetical inflation scenarios and outcome for investor

Inflation scenario	Capital value of Treasury Index Bond	Outcome for the investor
Actual inflation rate 1.5%, ie above the BEI of 1.39%	Capital value of the Treasury Index bond is adjusted higher	Increased benefit from the <b>higher</b> inflation outcome
Actual inflation rate is 1.0%, ie below the BEI of 1.39%	Capital value of the Treasury Index bond is adjusted lower	Decreased benefit from the <b>lower</b> inflation outcome

# Hedging the interest rate risk to leave pure inflation exposure

TIBs also have exposure to interest rate duration risk and therefore the value will move with the direction of interest rates as well as inflation expectations. In order to hedge the interest rate duration risk, there are three alternatives that can be implemented across the portfolio which will leave the desired exposure to pure inflation risk. The three alternatives are very liquid markets; however, some do create additional basis risk which would need ongoing management.

Basis risk exists in any hedging strategy where the price movements of the two products may vary over time due to the unique characteristic differences between the asset and the hedging product. For example hedging the interest rate duration risk of a cash bond with a bond future derivative or interest rate swap derivative.

The hedging alternatives to manage the interest rate duration risk from buying a TIB are discussed in further detail as follows.

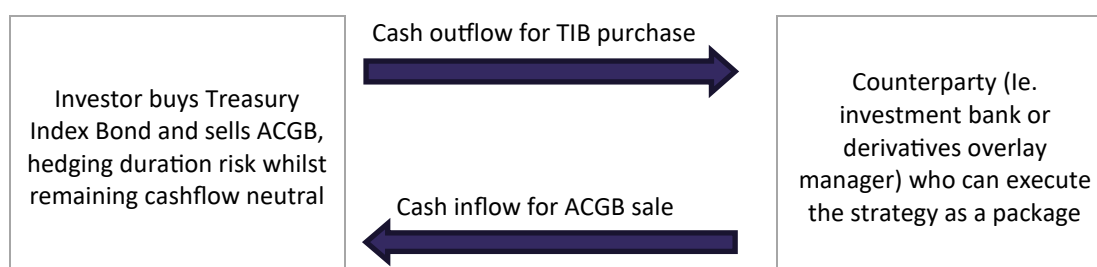
## Sell nominal bonds

The nominal bond market in Australia is a deep and liquid market. Given the profile of the Australian government deficit, the AOFM issuance program of both ACGBs and TIBs will provide ongoing liquidity and support to the market. The hedging strategy would be to sell the equivalent ACGB maturity that matches the corresponding duration of the TIB to eliminate the duration risk (and curve risk), leaving the exposure to implied inflation rate.

The hedging strategy is shown in Figure 1.

This strategy would be cashflow neutral, as the money received from selling the ACGB would be used to buy the TIB. If the investor doesn't already own an ACGB to sell, they could enter into a repurchase (repo) agreement where they can borrow the ACGB in exchange for cash or other collateral. The investor can then sell the ACGB, borrowed under repo, to raise the funds required to buy the TIB. Repo transactions require collateral management and have daily margining requirements. Shorting nominal bonds without owning them will require an investor to use the repo market, which can be complex and will require an appropriately resourced internal trading team.

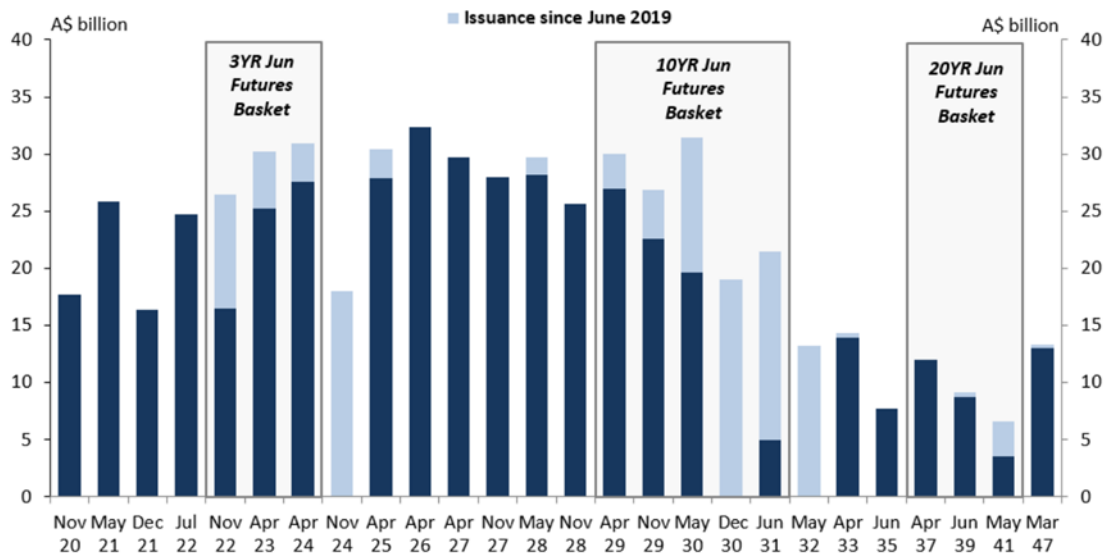
Figure 1: Hedging strategy



This strategy requires sourcing bonds (either buying outright or via repo) in the market to sell to offset the long TIB position. It can be difficult to implement this strategy without an internal trading team and so this strategy will more likely need to be executed with an investment bank (or a derivatives overlay manager as an intermediary) and structured as a package comprised of the long position to the TIB offset by the short position to ACGB.

There are a small number of banks (around five) which are active market makers in inflation bonds. Alternatively, investors can use a derivatives overlay specialist as an intermediary with the banks; the derivatives overlay manager can use their expertise with price sourcing to identify the best price for an investor.

Chart 8: Treasury Bonds on issue



Note: The AOFM has reverted to a pattern of issuance that it has used in the past when issuance programs were elevated. This involves high volume issuance in the most liquid (high-demand) parts of the yield curve while supporting other parts of the market by responding to demand and issuing in appropriate volumes. New maturities are established to support the futures contracts.

Source: AOFM as at 29 May 2020. The 1% 21 December 2030 Treasury Bond is not included in the June 10-year futures contract.



## Sell ASX Treasury Bond Futures

The Australian Stock Exchange (ASX) bond futures market is Australia's most active interest rate listed derivative product, offering investors a very deep and liquid alternative to the cash bond market. The ASX bond future is a derivative of a basket of underlying ACGBs and is supported by the Australian government bond market. The ASX bond future contracts have a three month maturity like most global listed future exchange products, however ASX bond futures are cash settled against the average price of a basket of ACGBs, which is unique relative to other global bond future markets where contracts are deliverable.

Buying a TIB and selling the 10yr bond future would also reduce the duration risk. However, given the nature of the ASX bond future market only has the 3yr and 10yr tenors, this would create curve basis risk within the portfolio if the TIB maturity did not align with the maturity of the future. Given the most liquid part of the TIB curve is the 10yr point, and with the AOFM continuing to target the 10yr point for new issuance, keeping TIB exposure to the 10yr maturity would allow for curve neutral hedging via the 10yr ASX bond future.

An investor needs to be mindful of a potential difference in behaviour of the bond and the corresponding bond future. This basis risk is called Exchange for Physical (EFP) basis risk and is created when there is variance in the price movements in ACGB prices and the corresponding ASX bond future prices. An EFP basis transaction is when one party buys the physical bond and sells the future contract, while the other party does the opposite. Bond EFP basis can move when there are different price movements in the physical bond compared to the bond future derivative. This will need to be managed and may be suited for a more active asset manager.

Using the ASX bond futures will result in the need to roll the future contract position every quarter, as the contracts are quarterly based (March, June, September and December). This process involves closing out of the 'front' contract and simultaneously moving (or rolled over) to the back contract. The movement between the front and back futures contract price can create additional basis risk, referred to as 'futures roll basis risk' which needs to be managed.

Due to the complicated nature of using bond future derivatives and the need for ongoing management for the different risks involved, one could consider to involve an asset manager or derivatives overlay manager to operate this on an investor's behalf.

## Pay interest rate swaps

Another alternative to hedge the duration risk from buying a TIB is to use the Australian interest rate swap market. An interest rate swap is an over the counter (OTC) derivative that involves an exchange of interest rate obligations (fixed or floating) by two parties.

The interest rate swap market is very liquid and, being an OTC derivative, can be tailored to customise the swap to the exact maturity and notional of the TIB. To hedge the duration risk using an interest rate swap, the investor can pay the fixed leg of the swap against buying the TIB. This would leave desired exposure to inflation.

Using pricing as at August 30 2020, the 10yr swap spread vs ASX 10yr bond future is trading at ~-9bps which is a 10 year low. This means that the 10yr interest rate swap rate is 9bps cheaper to pay than selling the 10yr ASX bond future. This provides a lower fixed rate on the interest rate swap compared to the implied yield of the 10yr bond future, which would provide a better outright yield to hedge the duration risk.

This strategy would need to be executed via a counterparty who is a swap dealer (normally a bank in the interbank swap market). The interest rate swap market is a deep and liquid market, although the EFP basis risk will need ongoing management as the basis can be volatile.

An active asset manager or investor who can trade actively between interest rate swaps and ACGBs may consider using this method as a way of hedging duration risk and achieving additional alpha return.

# Inflation swaps

Inflation swaps provide a market-based measure of inflation expectations and can be used as an alternative to buying Treasury Index Bonds. The Australian inflation zero coupon swap market is the most effective instrument to provide protection against rising inflation risk premia, with one party receiving a payment indexed to inflation in exchange for a payment determined by a fixed rate over the duration of the swap.

The OTC derivative market has several advantages of using the inflation zero coupon swap compared to buying TIBs. There is very little duration risk to manage over the life of the swap, unlike buying TIBs which involve duration risk management. Additionally, the cash management of the inflation linked swap is minimal with no upfront principal exchange and instead, only cash exchange at the maturity of the swap with daily margining requirements.

To enable a diversified exposure to cash inflation basis over an investors' time horizon, a strategy involving paying the fixed leg of the inflation zero coupon swaps over a variety of tenors would be more suitable. For an investor to gain exposure to inflation upside risk using a zero coupon swap, they would pay a fixed rate on the nominal value of the swap, and in return would be receiving the floating rate of the CPI index return on the nominal value over the life of the swap. The most liquid parts of the inflation swap curve are 2y, 5y and 10y tenors which correspond with the most liquid parts of the TIB curve.

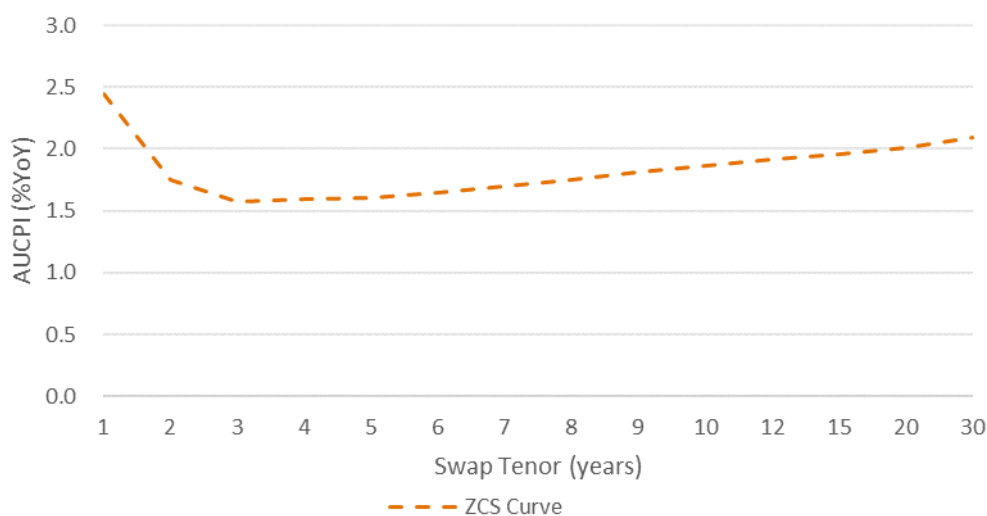
Not only would this help with liquidity execution, this would also gain appropriate exposure to inflation movements across the short end and long end of the curve.

Being an OTC derivative, an inflation swap can be tailored to suit the individual needs of the investor, such as maturity and notional, and can be used to hedge longer dated inflation-linked obligations or inflation-linked assets. The most liquid tenor of the inflation swap market is the 10yr point, with other liquid tenors of the curve matching the outstanding TIBs or nominal ACGBs.

A limitation of the Australian inflation linked swap market would be the smaller liquidity on offer as there are a limited number of market makers in the OTC market, and therefore the market activity is less active than the traditional interest rate swap market. Recent regulatory reforms, such as Basel III leverage ratios, has made it more expensive for banks to hold OTC derivatives on their balance sheet, which has been an impeding factor towards market activity and increased liquidity. Another factor would be the lack of confidence of a return to higher inflationary pressures globally, which has suppressed investor activity in inflation products. However, this could change materially if there are signs of rising inflationary pressures which would increase market liquidity.

The current spot inflation swap curve shown in Chart 9 illustrates expectations of long term inflation rates are well below the bottom of the RBA target band of 2-3% (at the ten year point), and therefore asset classes with a strong correlation with inflation could be vulnerable to future inflationary shocks going forward and is a key consideration for multi asset portfolio construction.

Chart 9: AU zero coupon swap curve out to 30 year maturity



Source: Bloomberg, Frontier. Zero curve as at 30th August 2020

# International inflation markets as an alternative

Considering the depth and liquidity limitations of the Australian Inflation swap and bond market, investors could look to use international markets as an alternative, such as the US and European markets. For example, the US Treasury Inflation Indexed Securities (TIPS) market is the largest inflation securities market in the world with over USD \$550 billion TIPS outstanding and average daily turnover over \$5 billion, compared with the Australian TIB market of AUD \$39 billion outstanding.

However, using the US inflation securities market for example, would create cross market basis risk between the moves in Australian CPI and US CPI, which would need to be managed and could cause undesired negative performance. Investors would need to be confident that the US inflation market can outperform Australian CPI over the desired time period.

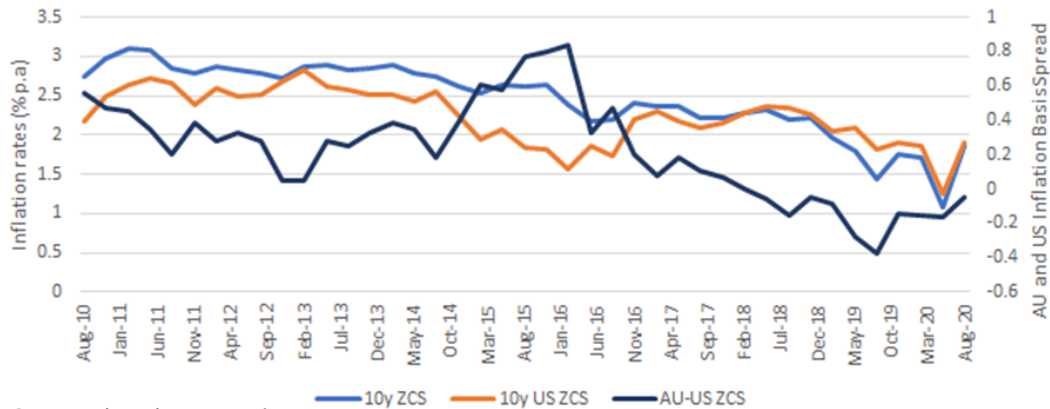
Using international inflation swap markets would gain exposure from global inflationary pressures such as oil and broader commodity prices.

However, this would also be subject to domestic inflationary factors that may cause significant variance away from Australian CPI, as well as not being able to capture domestic inflationary moves within Australia.

The basis risk is the key concern for considering using international inflation markets, even if there is the appeal of their increased liquidity. If liquidity is an issue, then one could consider using a mix of Australian and international inflation instruments.

Chart 10 shows the volatility of the moves in AUS/US 10yr inflation swap rates over the past 10 years, with the cross market spread moving from a high of +80bps in 2015 to a new low of -35bps in June before recovering to -3bps currently. Despite the broader inflation swap rates moving in similar direction, there can be a material underperformance by one of the countries CPI indexes which could create unnecessary performance drag.

Chart 10: AU and US 10yr inflation swap rates



Source: Bloomberg, Frontier.

Chart 11: Comparison of realised inflation rates in Australia and the US



Source: Refinitiv Datastream

# The final word..

Any portfolio which has a return objective expressed as a percentage return above inflation will be exposed to the difference between predicted and observed CPI over the relevant time horizon. A realised CPI which turns out to be greater than the originally forecasted CPI rate will reduce the chance of the portfolio meeting its return objective.

Hedging pure inflation risk has applicability for liability driven investors such as defined benefit plans and insurance investment portfolios which are seeking to manage assets to meet future liabilities. This risk is also relevant for more defensive portfolios (e.g. conservative superannuation portfolio) since these portfolios likely have higher allocations to cash and bonds, two asset classes with very low forecasted rates of returns for the medium-term time horizon. Investors can hedge this risk by “locking in” the CPI rate for a future time horizon.

In this paper, we have included an in-depth discussion on the different methods which an investor can use to reduce the loss potential from realised CPI being higher than the forecast CPI over a pre-specified period of time. There are two methods discussed:

1. Buying ILBs and hedging out the interest rate duration risk to leave the investor with exposure to pure realised inflation;
2. Buying inflation swaps whereby the investor receives the realised rate of inflation in exchange for paying a pre-agreed fixed rate of inflation.

The size of the inflation linked bond market in Australia is not large and so an alternative for investors to consider is to implement this trade using international inflation linked bonds. The benefit is the ability to trade a larger transaction size. The key risk, though, is different outcomes for inflation in Australia relative to overseas and therefore using international inflation markets as a hedge to Australian inflation risk can create cross market basis risk that needs to be managed and could cause undesired negative performance. If liquidity is an issue, then one could consider using a mix of Australian and international inflation instruments.

The decision to implement this inflation hedge is investor and portfolio specific. It will depend on the following:

- Capital market views about the potential for realised inflation to be higher than forecast;
- The weight of the portfolio to asset classes which could have a positive effect from rising inflation (e.g. equities or real assets);
- The weight in the portfolio to defensive asset classes like cash and bonds which have very low forecasted returns.

While this paper covers options and concepts, it is important to consider these and the various inflation exposures in the context of each investor’s total portfolio. For these various options to gain explicit inflation exposure and in thinking about each investor’s unique circumstances, Frontier works within our incumbent clients and can work with institutional investors to tailor any inflation program to suit your specific circumstances.



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