It does not make sense to pay too much for negative correlation

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Summary

Negative correlation has been something of a holy grail for portfolio construction ever since Harry Markokwitz's 1952 paper 'Portfolio Selection' introduced modern portfolio theory. The benefits of negatively correlated exposures need to be examined in the context of their costs though, and this is a nuance sometimes missed in the portfolio construction process. In this paper, two simple Australian fixed income exposures are compared in a proprietary framework to contrast potential asset allocation decisions.

This work was motivated by the changed macro-economic backdrop that investors currently face. The post-financial crisis world is different to the world that went before, and portfolio management has not fully adjusted to this. When investors seek to hedge exposures to risk assets, they need to concurrently consider the potential benefit of simply reducing such exposures versus the potential benefit of hedging them.

The world in a Liquidity Trap

The changed macro-economic backdrop aligns with the 'Liquidity Trap' diagnosis of Keynes in 1936. At that time, Keynes also noted that he knew of no example of a Liquidity Trap happening in practice. Inevitably then, there has been some debate among economists – is it possible for theory and practice to intersect? Under what circumstances?

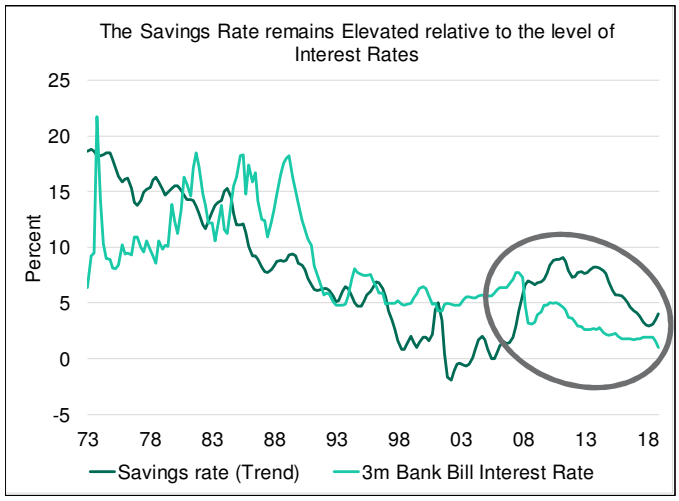
Different definitions and causes of the Liquidity Trap condition exist. As such there is some debate about whether the global economy is currently in a Liquidity Trap. In this paper, such semantics are pushed to one side and the definition of Liquidity Trap used is:

"A period when low interest rates fail to stimulate demand and monetary policy therefore becomes less effective, and ultimately ineffective."

There are several possible causes for this state of affairs: demographics, over-indebtedness and an associated strong desire to repair balance sheets are the more obvious ones. The effect of technology on labour markets is very likely another: the so called 'gig economy' is almost certainly fueling job security fears and constraining income growth. This has resulted in the consumer behavior illustrated in Figure 1 below. We see a consistent trend since the 1980s of savings rates sitting below short-term interest rates, and a reasonably strong directional correlation between the two series. This changed in 2008, when the savings rate jumped higher, and this sharp move higher has not been fully reversed since. The savings behaviour of consumers has undergone a structural change.

Figure 2 on the next page shows a similar story for business – in the US, the demand for loans is decoupling from supply at current interest rates. There is no problem around the willingness of banks to lend, but there is a clear issue around the desire of business to borrow.

Figure 1: Interest rates are not stimulating demand



Source: Daintree, Bloomberg, ABS. Dec 1973 to Dec 2019

Figure 2: The problem is not a lack of willingness on the part of banks to lend; it is a lack of desire on the part of business to borrow

Source: Daintree, Bloomberg. Jan 1996 to Nov 2019

Despite interest rates now sitting at record low levels, consumers have retained a heightened propensity to save. This is evidence that monetary policy is not having the same impact on decision-making in the real economy as it did prior to the financial crisis, and such evidence also exists in several other countries.

There are flow on effects of this behaviour to the corporate sector: despite the very low cost of borrowing, demand in the economy is insufficient for firms to expect a payoff. As a result, the hurdle rates businesses apply to determine whether an investment is expected to be profitable or not remain high, even as interest rates fall.

Caution extends to costs as well: The unwillingness of businesses to pay higher wages feeds back into cautious consumer behaviour, which leads to a further lack of demand and an even lower desire on the part of businesses to invest. This sort of feedback loop of low consumption and investment means demand remains low, globally. This is a backdrop which supports structurally lower inflation, and structurally lower interest rates. Until we exit the Liquidity Trap, it is likely that many developed nations will struggle to hit their inflation targets in a sustainable way. Cost-push inflation needs to be distinguished from demand-pull, in that cost-push inflation stunts economic growth and encourages precautionary saving, while demand-pull inflation is a symptom of growth excesses and a lack of saving. Even if self-sustaining growth in consumer prices does finally arise in one country but not others, the impact will be limited because currency appreciation will redistribute excess inflation in one economy to others where demand and inflation remain lower. It is difficult to see how global inflation can increase sustainably until precautionary savings behaviour becomes less prevalent.

Policies to deal with the changed environment

Exiting the current environment will not be easy. Table 1 outlines potential strategies for policymakers:

Table 1: A matter of time

How can economies address this situation?		
Currency devaluation	✗	Too many countries with the same problem
Reduce borrowing costs	?	Helps, but not in isolation
Expansionary fiscal policy	✗	Won't happen outside a crisis
Time	✓	But chance of market disruption increases

Of the options listed, three are problematic and this underlines the structural nature of the economic shift:

1) Currency devaluation

   Currency devaluation is an effective policy for an economy experiencing weakness in isolation. In the context of a multitude of bilateral exchange rates, however, it is impossible for all countries to increase external demand at the same time. That means currency devaluation doesn't help much in today's economy, because many countries have the same demand-side problems.

2) Reduce borrowing costs

   In most jurisdictions, borrowing costs have already been reduced to the maximum extent possible (or close to the maximum) to stimulate domestic demand. In Australia there is more that can be done, because interest rates are not yet at their lower bound and unconventional policy has not yet been enacted. The problem is that

interest rate reductions are less effective as they reach the lower bound. Unconventional policies face the same issue: Quantitative easing in other countries has already reduced Australian bond yields across the term structure, and so if Australia implements such a policy the impact will be limited. Successive iterations can also be expected to suffer from the same diminishing marginal returns that we have seen from offshore programmes.

3) Expansionary fiscal policy

Expansionary fiscal policy to offset private sector saving can take many forms, in the extreme 'helicopter money', to kickstart demand and boost inflation. Moving to expansionary fiscal policy in this environment would be an implicit acknowledgement that central banks cannot independently create inflation without fiscal co-operation, and such policies may be the most effective way to combat the current environment. The Governor of the Reserve Bank of Australia Dr. Philip Lowe, and the President of the European Central Bank Christine Lagarde, are among those appealing to government to loosen fiscal policy. Unfortunately, government reluctance means fiscal policy will probably only be enacted in enough size, and with sufficient global co-ordination, if a crisis is already occurring. For that reason, fiscal policy is most likely a crisis management tool as distinct from a potential way of dealing with the Liquidity Trap.

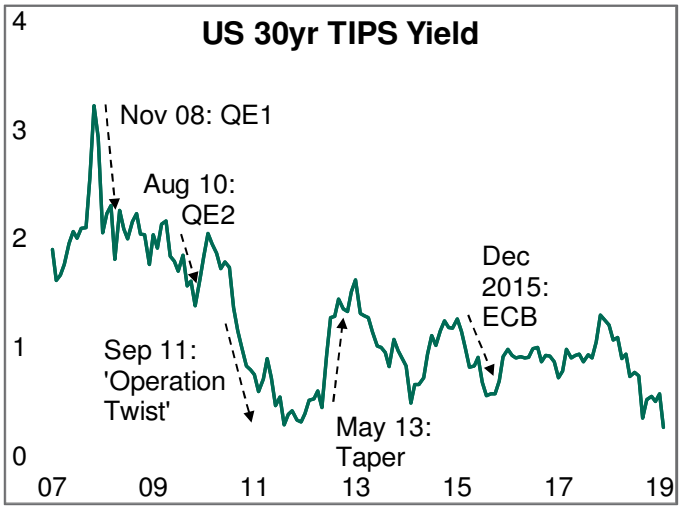
4) Time

With the various policy levers limited in some way, it seems likely that countries in a liquidity trap will remain so. Eventually, balance sheet repair will happen if borrowing costs are kept low. That would see demand increasing. There is a paradox here though, particularly in Australia: Low borrowing costs are themselves supporting higher levels of leverage. In some parts of the economy, notably parts of the housing market, consumers continue to use low rates as an opportunity to increase leverage rather than to deleverage. Thankfully, in aggregate this is not the case in Australia. Such behaviour (and the behaviour we see from investors in some parts of the financial markets) does, however, illustrate that the risk of an unpleasant market disruption increases when interest rates are kept low for an extended period.

Dealing with the changed environment in portfolio construction: What are markets telling us?

Structural changes like this are difficult for asset allocators to deal with effectively. Even after enough time has elapsed for a thesis to become more probable, there is still a reticence to acknowledge: "This time it is different." Nonetheless, it does seem likely that an extended period of Liquidity Trap dynamics is 'locked in'. This means investors can expect low interest rates to persist over the next several years. Quantitative easing is a part of this: Inflated central bank balance sheets are likely to persist, and such policies are now part of the mainstream toolkit for central bankers globally. Figure 3 on the following page shows the 10-year real yield in the US (as measured by 10-year TIPS), and the extent to which unconventional monetary easing programmes have stripped away the supply of duration from the US bond markets. These effects have flown through to other bond markets, making sovereign bonds historically expensive.

Figure 3: QE and US real yields

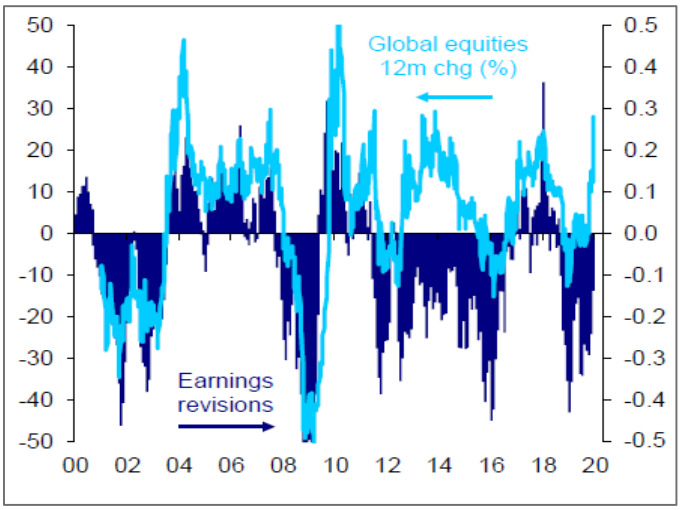


Source: Daintree, Bloomberg, Dec 2007 to Dec 2019

Unconventional policies are of course not the only driver of bond yields, or even the main driver at times. Nonetheless it is clear that these announcements had a major impact on yields, more so than the actual actions themselves when the various programmes were started. Inflation expectations have also moved lower in concurrence (though the move has been less marked than the move lower in real yields), and this move lower in both components of nominal bond yields has had a profound effect on asset valuations across the spectrum of investment opportunity. Specifically, this means that the distribution of expected future returns has changed. Across most asset classes, investors can expect returns in the next 10 years that are much lower than those experienced in recent history.

Figure 4 illustrates one interesting effect of this backdrop, with the long-held relationship between equity returns and earnings having clearly broken down. Equities are now expensive, and equity prices have become less sensitive to earnings. On the other hand, equity valuations are more sensitive to the discount rate, and therefore the move lower in bond yields has been a massive tailwind for equity investors. Higher valuations today, however, also mean lower expected returns over the next several years.

Figure 4: The discount rate has been more important to valuations than earnings



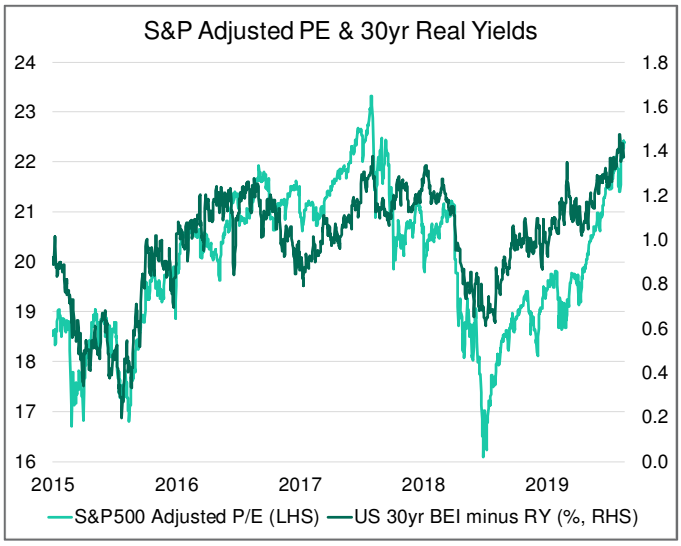
Source: Citigroup, Jan 2000 to Jan 2020

Although equity valuations are less dependent upon earnings than in the past, it is interesting to also note the impact of the policy backdrop on the price to earnings multiple. This is shown in Figure 5 on the following page which reveals a common trend: the discount rate also seems to be driving the multiple. The darker series shows the difference between 30-year market inflation expectations (i.e. break-even inflation) and 30-year real yields. Illustrating both series in this way is useful because while real yield levels are distorted relative to their pre-GFC levels by unconventional policy, break-even inflation is less impacted. That is, real yields are not very reflective of future growth expectations, whereas pre-GFC such a statement could be argued more convincingly. Interestingly, break-even inflation also reflects growth expectations, but in a less direct way:

- If the trade-off between growth and inflation is positive, then real yields will rise as inflation expectations rise. The increase in the real yield reflects expected future policy tightening to keep inflation contained. If policy tightening looks like it will overwhelm the expected inflationary impact of the growth backdrop, then real yields will rise more than break evens. The dark green line would move lower in this environment.

- In the current environment we see the opposite trend – a negative trade-off whereby expectations of monetary policy expansion for an extended period have been required to support expectations of inflation. As a result, the dark green line has been moving higher on average since the GFC: falling real yields have outstripped the fall in inflation expectations. This is particularly so over the course of 2019. The relationship of the S&P500 adjusted PE ratio with this trend is clearly apparent:

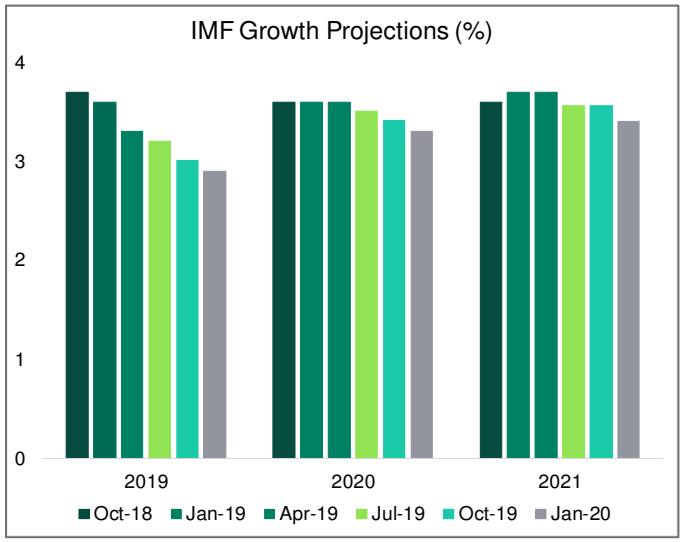
Figure 5: The discount rate has driven the multiple



Source: Daintree, Bloomberg, Dec 2014 to Jan 2020

This chart shows that low interest rates are unlikely to lead to inflation, which is ultimately causing markets to assume higher earnings growth into the future regardless of recent earnings out-turns. Typically, real economic growth has been an important driver of earnings reassessments and higher asset prices, but that seems to be less the case now than in the past. In the current environment, it seems that markets themselves are the greater determinant of the cycle, as opposed to the real economy. In other words, markets are telling us that low interest rates will themselves lead to higher earnings growth, regardless of the wider macroeconomic backdrop. Indeed Figure 6 shows that global growth expectations have been falling, not rising:

Figure 6: The disconnect between markets and growth expectations



Source: IMF World Economic Outlooks Oct 2018 to Jan 2020; Daintree

It is a step too far, however, to also assume markets are structurally changed. Markets remain exposed to any serious growth slowdown. The recent episode around the Coronavirus illustrates this clearly. Until such a slowdown becomes very likely, however, low real yields will continue to support the performance of risky assets.

This leaves investors in an unenviable position: To achieve return targets among compressed risk premia in most asset classes, more risk needs to be taken. This needs to happen while acknowledging already stretched valuations. As investors extend their risk tolerance in this environment the likelihood of large negative return outliers increases, even as volatility in most asset classes remains relatively low. This is particularly so given that the ability of central banks to deal with a major downturn is severely constrained. Fiscal policy must therefore step in, but it is not sufficiently timely even when used by individual countries. When a large, globally coordinated response is required (as would be the case to arrest a serious market downturn) this problem is exacerbated.

Dealing with the changed environment in portfolio construction: What action should investors take?

In such an environment portfolio hedging needs to be closely examined. When both risk assets and potential hedges are historically expensive there is an important

trade-off to be made between the reliability of a hedge, and its cost. Sometimes, this trade-off illustrates that a given hedge should be reconsidered, as the investor may be better served to simply reduce his or her allocation to the risky asset class in question. In Figures 7 and 8 on the following page, the output of a proprietary methodology is used to demonstrate one instance of this.

Figure 7 shows the historical utility of an allocation to the Bloomberg Australian Composite Bond Index in hedging ASX200 equity exposure[1]. The proprietary methodology used ranks potential hedges according to valuation; correlation and its consistency; downside beta and its reliability; and carrying cost. The implication from Figure 7 is clear – whilst negative correlation benefits from the duration of the index are still present, these benefits have been weakening through 2019. This makes intuitive sense – as yields fall, the likelihood of further capital gains from even lower yields is reduced and the distribution of future capital price movements from bonds becomes more asymmetric. With interest rates set to stay low, we expect the utility of duration in portfolio construction to fall further. Put simply, government bonds now increasingly represent not so much a risk-free return over time but instead a return-free risk!

In this environment it is still possible to find assets with a reliable negative correlation, but much more difficult to find such exposures at a reasonable price. Comparing the cost and efficacy of hedging with assets that have a very reliable negative correlation to that of hedges with a less reliable negative correlation is now an important task for investors. How much is an imperfect hedge worth, and how imperfect is the hedge in question? Given that any hedge reduces equity market beta while also introducing a running cost to the portfolio (in terms of both lower expected returns and the carrying cost of the hedge) such a comparison makes sense.

Figure 8 shows an example of this framework. The same series presented in Figure 7 is presented again. In addition, the light green line compares the hedging efficacy of a long exposure to floating rate credit (66.7% allocation to the Bloomberg Credit FRN Index) and cash (33.3% allocation to the Bloomberg Bank Bill Index). To be clear, the new series shows the efficacy of reducing equity exposure in favour of floating rate credit, rather than government bonds. Floating rate credit is an asset class that has not historically been negatively correlated to equities in a risk-off environment[2]. What such an allocation does provide, however, is a better yield while also reducing overall portfolio risk relative to a full equity allocation. By contrast, a long duration position has historically provided a reasonably stable negative correlation to equities; but is now offering a diminished yield and low expected future capital appreciation, which means a less effective hedging capability when this is required.

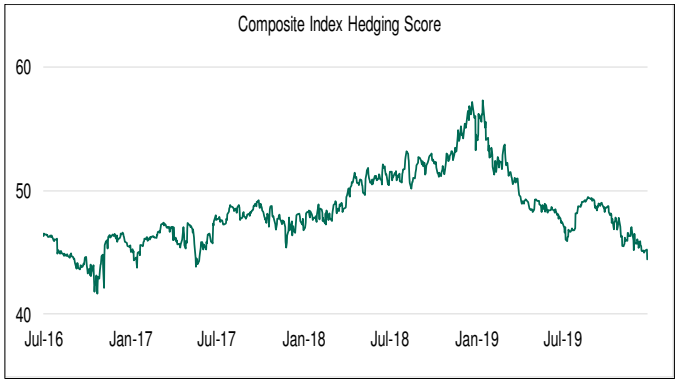
There are two ways to reduce risk in a portfolio. One is to dilute it (by decreasing risk asset exposures in favour of lower beta assets or cash) and the other is to seek to actively reduce it, by seeking a low or negatively correlated exposure. It is interesting to note that decreasing risk is a little more effective in our example, because many hedges have become more expensive while their negative correlation has become less reliable. Interest rate duration is a case in point. This goes against conventional asset allocation wisdom; but simply reflects the fact that the cost of hedging is now historically expensive relative to the expected benefits.

This example illustrates a simple point: hedging risk asset exposure and reducing it should be considered concurrently. As the valuation of both risk assets and hedges have risen simultaneously with the fall in real yields, government bonds no longer represent a risk-free return, but rather a return-free risk. The cost of negative correlation to risk assets needs to be directly compared to the cost of a simple reduction in risk asset beta in the current environment.

[1] A government bond index could have been used to yield very similar results.

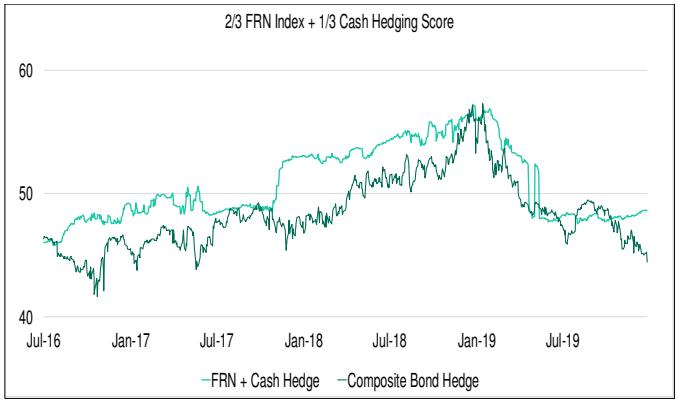
[2] Correlations are, however, not particularly high. A correlation with equities of between 0.0 and 0.2 is common.

Figure 7: Long duration as a mainstay of balanced portfolio construction needs a re-think



Source: Daintree, Bloomberg, Jun 2016 to Dec 2019

Figure 8: A reduced equity allocation in favour of cash and short-term credit: The cost and reduced correlation benefit of government bonds is clear



Source: Daintree, Bloomberg, Jun 2016 to Dec 2019

Conclusion

The Liquidity Trap environment of precautionary savings amid low interest rates presents a challenging backdrop for investors, and particularly investors who make asset allocation decisions. One particular challenge is an increasingly ambiguous relationship between the real economy and markets. Markets are currently telling us that equity valuations can continue to 'melt higher', even as real economic performance remains lacklustre, because central bank policies are so supportive. As economies are structurally changed, only the passage of time will allow balance sheet repair to be sufficient for the world to move to a new policy regime, and that means consideration needs to be given to investment strategies that deal effectively with this new long-term environment. Hedging of risk asset exposures is the main such strategy covered in this paper.

Central bank policies are likely to remain expansionary for some time to come. Interest rates may therefore not rise in a sustained bond sell-off, and volatility should remain relatively low across markets, relative to previous market environments. Instead, uncertainty is the real problem for investors. The potential for short, sharp selloffs that give rise to damaging negative return outliers remains the most important risk-management consideration. This is particularly the case for investors with heavy duration holdings. The negative correlation benefit from holding duration has been steadily eroding as bond yields fall and if the prices of both risk assets and bonds fall concurrently, many portfolios in both the traditional and risk parity spaces will be damaged. Many traditional asset allocations are also exposed to these potentially outsize negative returns because the duration of bond indices has lengthened over the years.

Sensible asset allocators should therefore be wary of traditional balanced fund exposures. It does not make sense to pay too much for negative correlation in the current environment. Other solutions exist that intelligently trade-off correlation, reliability, and costs across a range of defensive assets.

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