

Introduction

2020 will go down as a challenging year (but certainly not the worst though – search ‘536 AD’ for a run down on the worst year!). The demand destruction, and the government support (be it via monetary and/or fiscal) to fill in the chasm has been of truly epic proportions. We look forward to 2021, but we’re mindful that there are many sectors of the economy (domestic and global) that are still hurting. We’re also conscious that the imbalances that existed prior to Covid still remain and in many ways are now much bigger. Whilst this sounds negative, we also see many new opportunities emerging – infrastructure and a focus on productivity supporting reforms will hopefully be at the forefront of the agendas for governments and business alike – and for this readership group I dare say this will all be quite exciting for the years ahead.

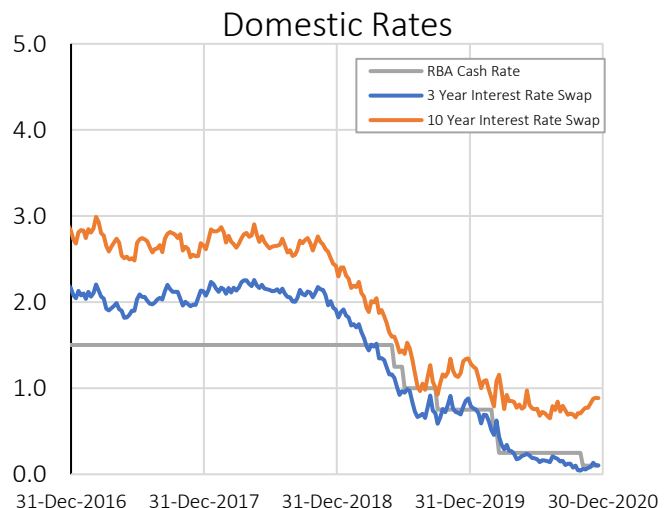
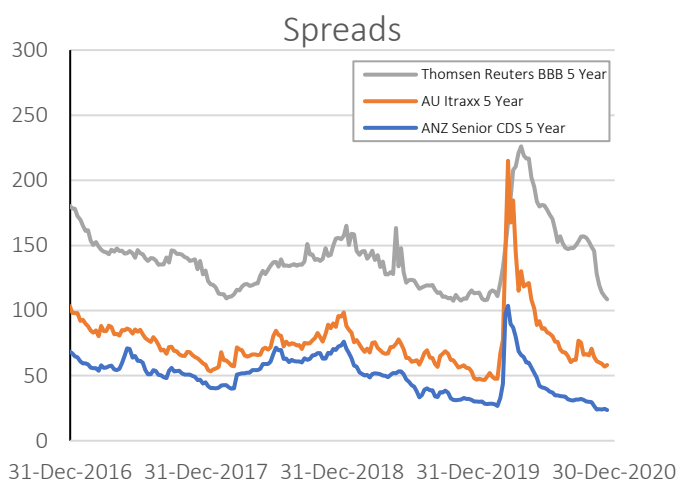
In this quarter’s newsletter we look at the impacts of seaports during the pandemic and surprisingly how merchandise trade has been sustained through the pandemic. The second article looks at the risk return trade-off between defensive and growth assets in a zero base rate world. The third and fourth articles are for the energy nerds/wonks amongst us.

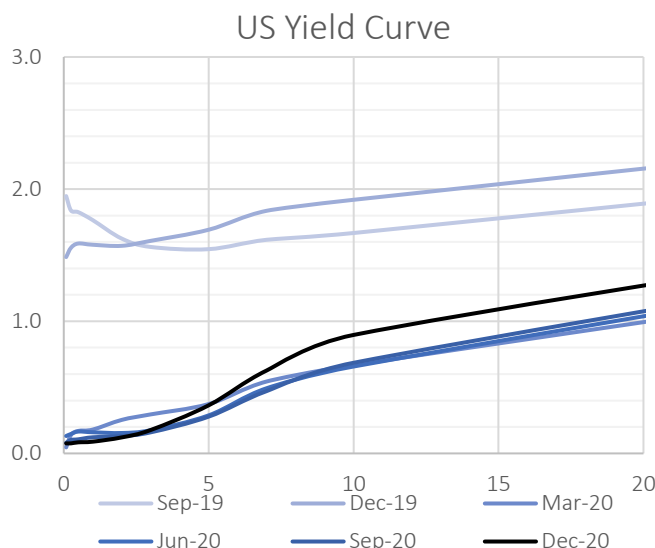
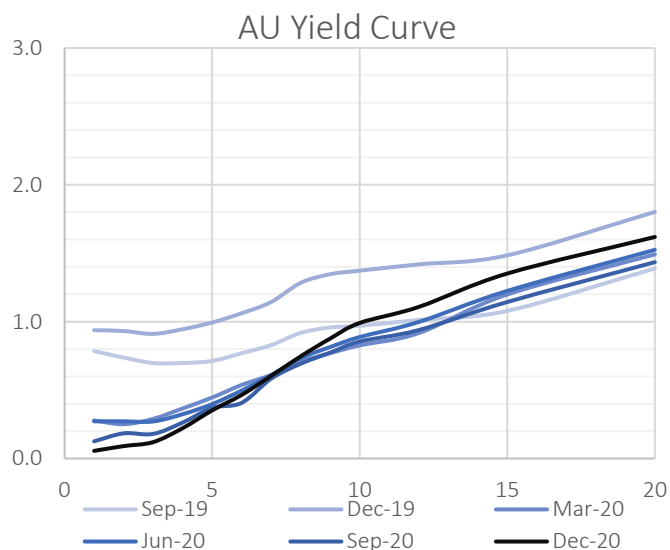
As the year closes, team Infradebt would like to thank our investors for putting their faith in us to manage their capital and would like to thank new and existing investors for their continued support in what has been a successful year deploying capital into a range of investments – all of our strategies have performed remarkably well, but it’s only possible because our investors put their faith in our strategies and investment process.

To everybody, thanks for continuing to read this newsletter. We hope you all have a great Christmas/New Years and we look forward to engaging with you again in 2021.

Markets update

Credit spreads recovered to pre-Covid levels this quarter. Interestingly, the yield curve has steepened, with the short end falling effectively to zero and the long end increasing (presumably with a vaccine roll out and rebound in economic growth on the horizon). On 10 December a record was set with an Australian 3 month note selling at negative yield for the first time ever, with some notes settling at -0.10%, with the average yield settling at 0.01%!





New issuance and refinancing

Date	Borrower	Instrument	Size (\$m)	Term (Yrs)
September	Tesla Virtual Power Plant	Loan (CEFC)	30	n/a
September	Batchelor Solar Farm and Hudson Creek Power Station	Loan (NAIF)	37	n/a
September	New Gullen Range Wind Farm Refinance	Loan	188	5
September	Columboola Solar Farm	Loan	219	5
September	Bald Hills Wind Farm	Loan	163	3
October	Sebastopol Solar Farm	Loan	119	5
October	Willogoleche Wind Farm	Loan	246	5
October	Western Downs Solar Farm	Loan	360	5
October	Jemena/Zinfra	Loan	300	6
November	TransGrid Services	Loan (CEFC)	125	n/a
November	Westconnex	Loan	4,250	2/3/5/7
November	Canberra Light Rail	Loan	280	5

Equity and other news

- AustralianSuper has offered NZD\$7.43 per share (NZD\$5.37 billion) to buy Infratil (ASX:IFT). This is approximately a 22% premium to the closing share price prior to the bid. The offer includes cash consideration of NZD\$5.79 per share and a distribution of 0.22 shares of New Zealand gentailer, Trustpower. Infratil’s asset base includes 65% of Tilt Renewables, Wellington Airport, CDC Datacentres and other assets. Infratil has rejected the offer and have publicly stated they will not engage with AustralianSuper. Since the announcement the share price has rallied from around AUD\$5.50 to around AUD\$6.70.

- The Dalrymple Bay Coal Terminal IPO (ASX:DBI) was successful at \$2.57 per share, valuing the equity at \$1.286 billion, an implied enterprise value at \$3.074 billion and an EV/EBITDA of 16.6x. Since listing the share price has fallen to \$2.06 per share as of mid December.
- New Energy Solar (ASX:NEW) has announced a sales process for its two Australian solar farms. The assets up for sale are the 110.9 MWdc Beryl Solar Farm and 55.9 MWdc Manildra solar farm. Both assets have high levels of contracting with currently low merchant risk. They have also announced they will keep their US assets and seek to improve their operational performance.
- Tilt Renewables (ASX:TLT) is undertaking a strategic review of its wind farm assets that will probably result in a sales process. This is related to the bid by AustraliaSuper to buy Infratil (and Tilt Renewables). Tilt’s share price has rallied approximately 30% since the announcement.
- FRV has announced a sales process for a 50% stake in its Australia solar farms. It’s solar farms include the Clare Solar Farm, Lilydale Solar Farm, Moree Solar Farm, and the Royalla Solar Farm.
- Infrastructure Capital Group has acquired a 75% stake in the 119 MW Willogoleche Wind Farm from Engie. Included in the deal is Engie’s pipeline of wind and solar assets in Australia.
- Blackrock is seeking bids for the 180 MW Daydream Solar Farm and 60MW Hayman Solar Farm, both of which are RCR constructed assets. The solar farms are supported with offtake agreement with Origin Energy.

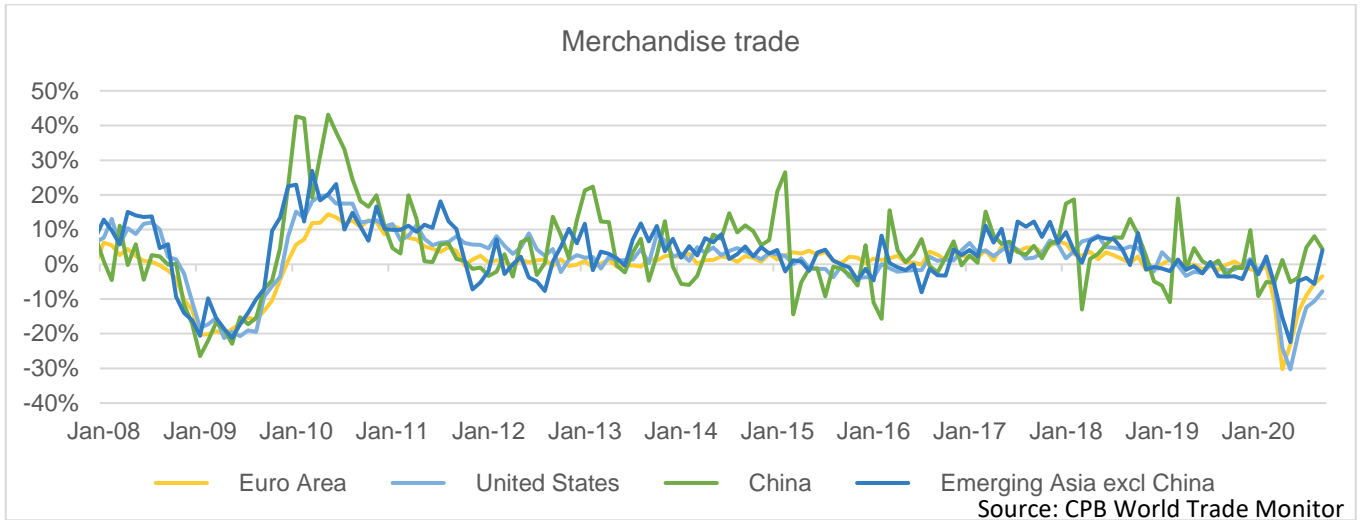
Seaports and Covid

Seaports, like airports, are considered high quality, low risk monopoly infrastructure assets. Both port types traded around 20x EV/EBITDA prior to Covid. Seaport volumes are correlated with broader economic growth. This article investigates the key impacts of Covid on seaports and trade volumes.

The chart below shows global merchandise trade volumes over the last 20 years. The two key shocks over this period are the global financial crisis (GFC) and Covid events. While both events saw similar peak falls in trade volumes (circa 20% year on year declines), they are actually quite different. The GFC had a much longer impact on volumes. Year on year volume growth was negative for 14 months (Oct 2008 to December 2009). In contrast, Covid at this stage, is looking like a much shorter duration hit to merchandise trade volumes (more like six months). This makes a huge difference in terms of the profitability and financing stresses to ports (as well as the valuation impact).

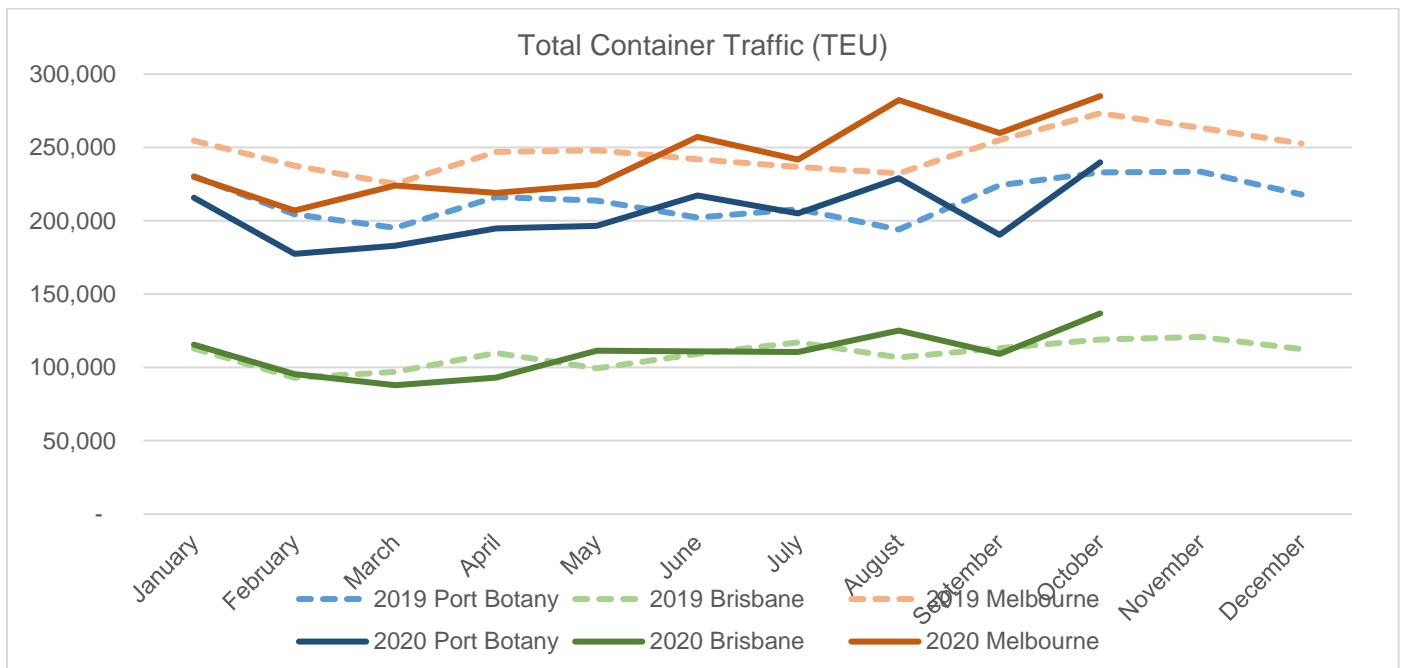


Digging deeper into the data, the major developed economies took a 30% hit to trade. On published data, China did not have a material reduction in trade volumes.

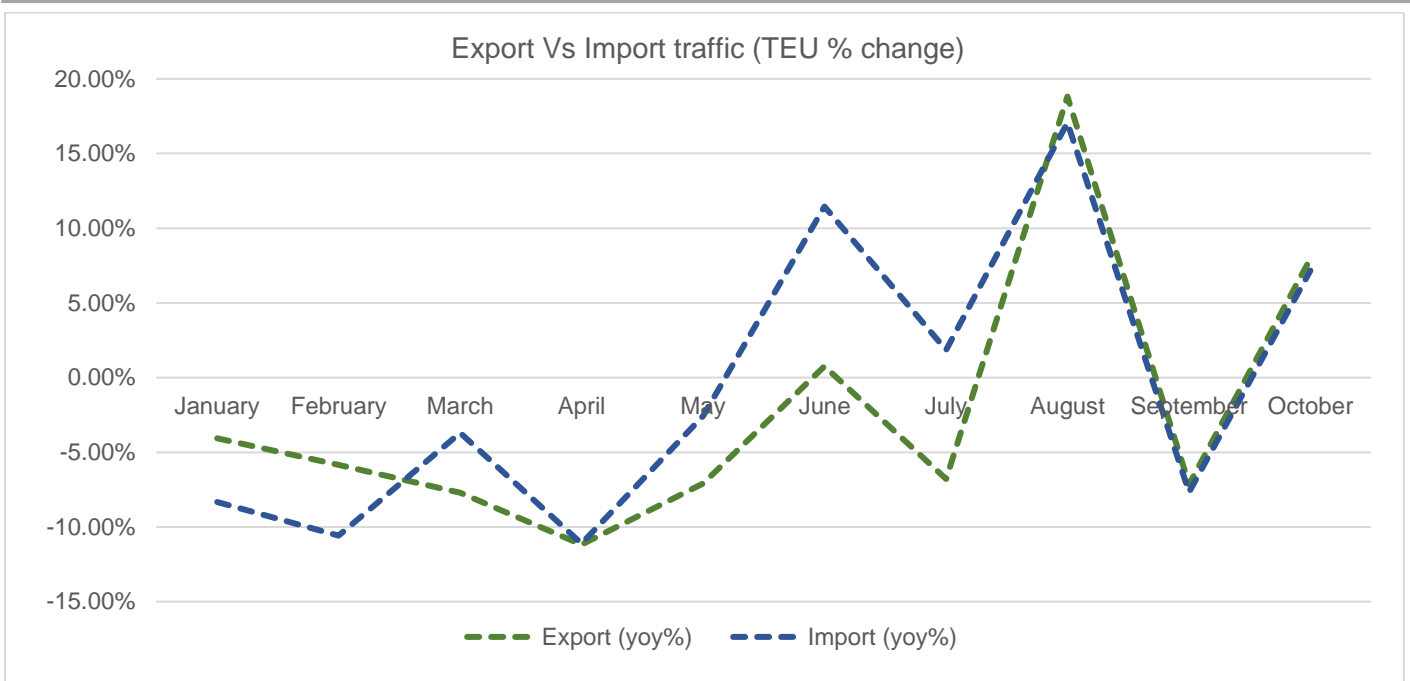


Looking at Australia, containerised trade has held up reasonably well. The following charts compare container volumes this year compared to volumes in 2019. There was a 10% dip in container volumes over April and May with a catch up over July and August. Overall container volumes have been steady in in Australia across the 2020 calendar year and are now broadly tracking in line with the year before.

From an investors' perspective this is a fantastic result. I am sure most airport owners would be looking at this resilience with longing.



Source: Company websites for each respective port

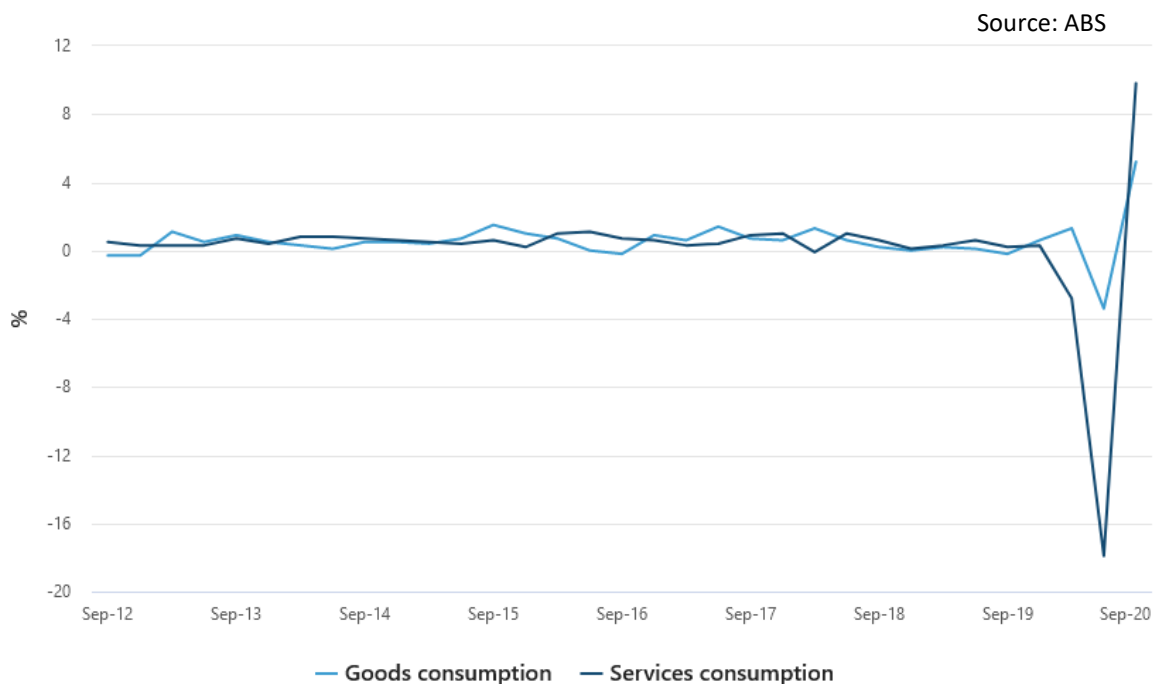


Source: Company websites for each respective port

Part of the explanation of the resilience of ports is the differential between the goods and services sectors of the economy. International trade in goods (i.e. things) largely comes across the border in ports (airfreight is much smaller). Services are traded in person (think tourism, international students) or over the internet.

The latest Australian GDP statistics show that the GDP contribution from goods fell 3-4% whereas from services fell a massive 17-18%.

It is difficult to consume services in the middle of a lock down! Whereas goods continued to be consumed and facilitated by e-commerce transactions despite physical stores being closed. This resilience in goods feeds through to strength in volumes through Australia's seaports.



Source: ABS

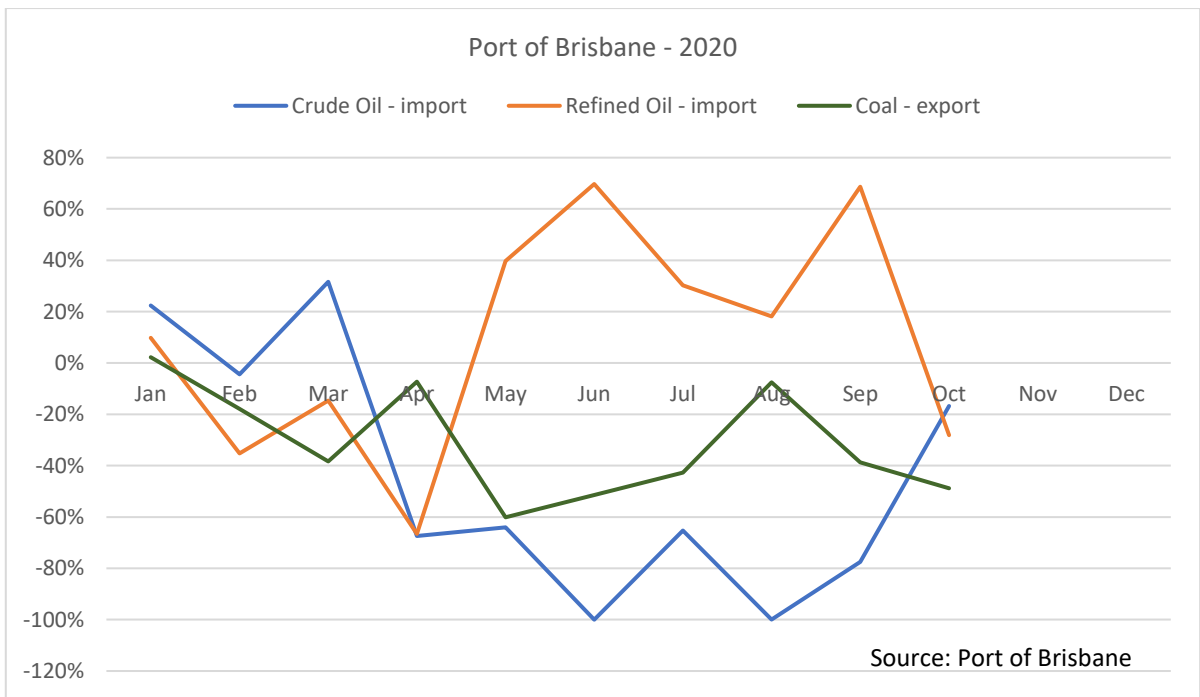


Diverting somewhat from infrastructure, there have been interesting numbers published on the accelerated adoption of e-commerce (in the absence of other options during lockdown). As a percentage of retail sales e-commerce has been growing as a larger and larger share of total consumer spend at around 1% per year. During the Covid lockdown, 10 years worth of growth was pulled into the space of 8 weeks. The question will be whether habits have been formed or whether we will return to trend.



Source: Bank of America, U.S. Department of Commerce, ShawSpring Research Source: Shawspring Partners

Reflecting the global hit to energy demand, bulk shipments of oil imports and coal exports fell dramatically over the year. Presumably as state border closures ease and domestic travel and tourism resume – the oil import side of this will rebound. In fact, with Australians forced to forgo their overseas travel (at least for the next 6-12 months depending on the speed and effectiveness of the global vaccine roll out), perhaps we are about to see the return of the family road trip and a consequent boom in oil/petrol demand.



Source: Port of Brisbane

Overall port volumes are excellent core infrastructure investments and have demonstrated impressive resilience through the Covid shock.

Low interest rates break standard risk measures

This article isn't strictly about infrastructure, but is about the search for defensive yield – which is often one of the justifications for a strategic asset allocation to the infrastructure asset class. Defensive yield in a low interest rate world is challenging!

Standard Risk Measure Background

Since 2010, APRA has required superannuation fund trustees to provide disclosure on the investment risk of the various investment choices offered by funds. Core to this disclosure obligation has been to provide a Standard Risk Measure disclosure for each investment option.

This Standard Risk Measure defines risk as the probability of a negative return (not its size). Super funds have to disclose the expected number of negative annual returns over a 20 year period and then classify each option accordingly (see table of Risk Labels below). This disclosure obligation creates a firm link between the assessed probability of a negative return and the riskiness – as described to members in fund's marketing material – of an investment strategy.

Table 1: Risk Labels under Standard Risk Measure

Risk Band	Risk Label	Estimated number of negative annual returns over any 20 year period
1	Very Low	Less than 0.5
2	Low	0.5 to less than 1
3	Low to medium	1 to less than 2
4	Medium	2 to less than 3
5	Medium to high	3 to less than 4
6	High	4 to less than 6
7	Very high	6 or Greater

Source: FSC/ASFA

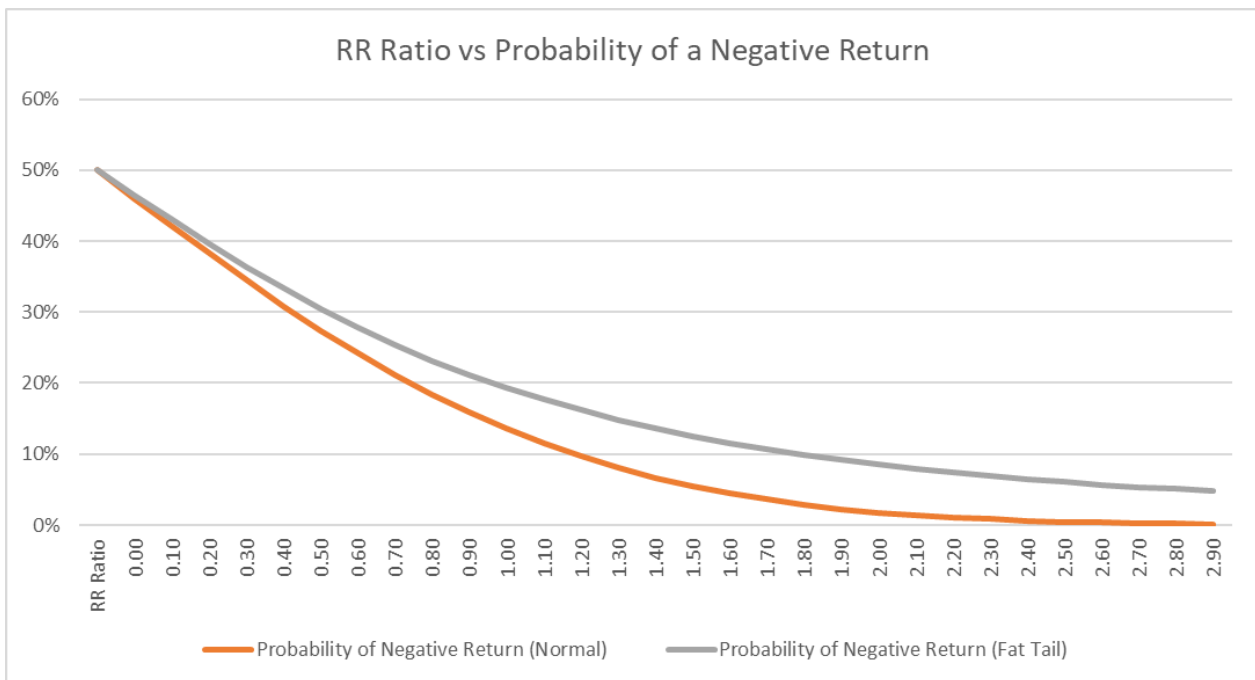
Standard Risk Measure – A Simplified Two Asset Class Example

In a more normal interest rate world, cash/fixed income offered a high return, particularly relative to the standard deviation of returns. Return to risk ratio (RR) that is the ratio of the expected return to the standard deviation of returns.

RR ratios are directly analogous to probability of a negative returns. The higher the RR ratio the lower the chance of a negative return. The chart below shows return outcomes both assuming a normal distribution as well for a leptokurtic or fat tailed distribution. While negative returns are more probable with fat tails – the overall shape is very similar.



Chart 1



Compared to bonds, equities have an expected return lower than their standard deviation – this results in a reasonably low RR ratio. Roughly a third of the time equity returns are negative. For this reason, a pure equity portfolio will typically be expected to have 6 or greater negative returns in a 20 year period and score a “Very High” risk rating under the standard risk measure.

But all is not lost, in constructing diversified portfolios you could mix cash/bonds (a high RR ratio) with equities (low RR ratio) and get whatever blended ratio you wanted. This meant you could dial in whatever probability of a negative return you wanted.

		Low	High
Historic Std Dev	2.8%	13.9%	
Historic Return	4.9%	9.1%	
Prospective Return - 2017	2.5%	5.5%	8.5%
Prospective Return - 2020	1.0%	4.0%	7.0%
RR Ratio			
Historic	1.78	0.65	
Prospective Return - 2017	0.91	0.40	0.61
Prospective Return - 2020	0.36	0.29	0.50

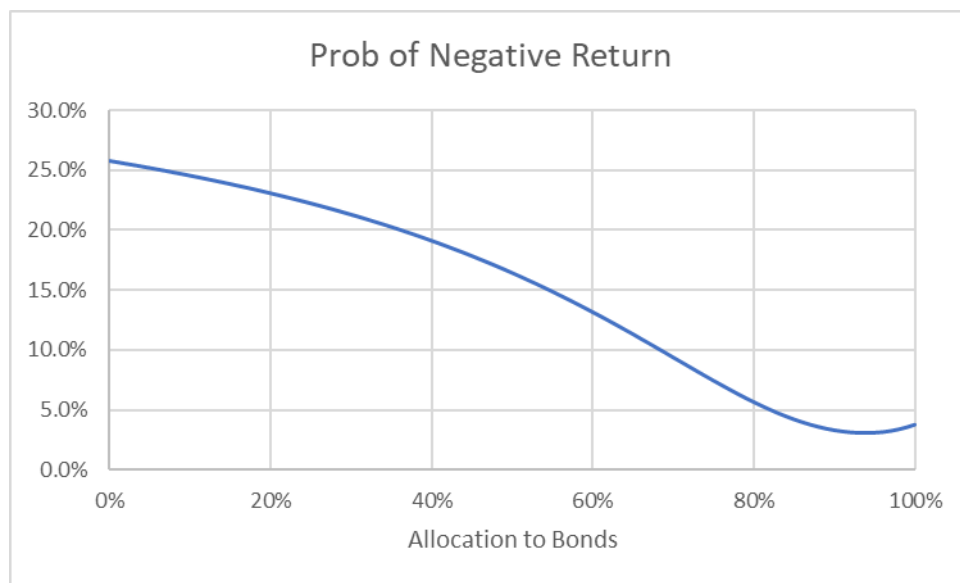
To illustrate this, I have constructed a very simple asset allocation model of the form used by superannuation funds and their asset consultants to underpin their strategic asset allocation decisions and risk disclosures.

My model has only two assets classes – bonds (proxied by the Bloomberg Ausbond composite) and Shares (proxied by the ASX200). My model assumes normal distributions (no fat tails) and ignores taxes and fees. It has been calibrated on risk data from 2012 to 2020 (monthly).

While more sophisticated modelling and a broader range of asset classes would be interesting – I would argue that the illustrations from this simple two asset class model show the heart of the modelling that underpins the majority of superannuation fund’s strategic asset allocations and standard risk measure disclosures.

The main aspect that might significantly affect results is the inclusion of alternative assets (that is private market assets like infrastructure). Readers should note that the modelling of private market assets – where, by definition, there aren’t reliable benchmark indices on which to base statistical models – falls very much into the dark art (aka witchcraft) rather than the scientific end of risk modelling – but I will leave that question and debate for another article.

Using my simple two asset class model, the chart below shows the probability of a negative return at a portfolio level and how this varies based on allocation to bonds. At 100% bond allocations this risk is very slow (sub 5% or 1 year in 20 – enough to get a Low standard risk measure). It then rises sharply as the allocation to bonds falls.



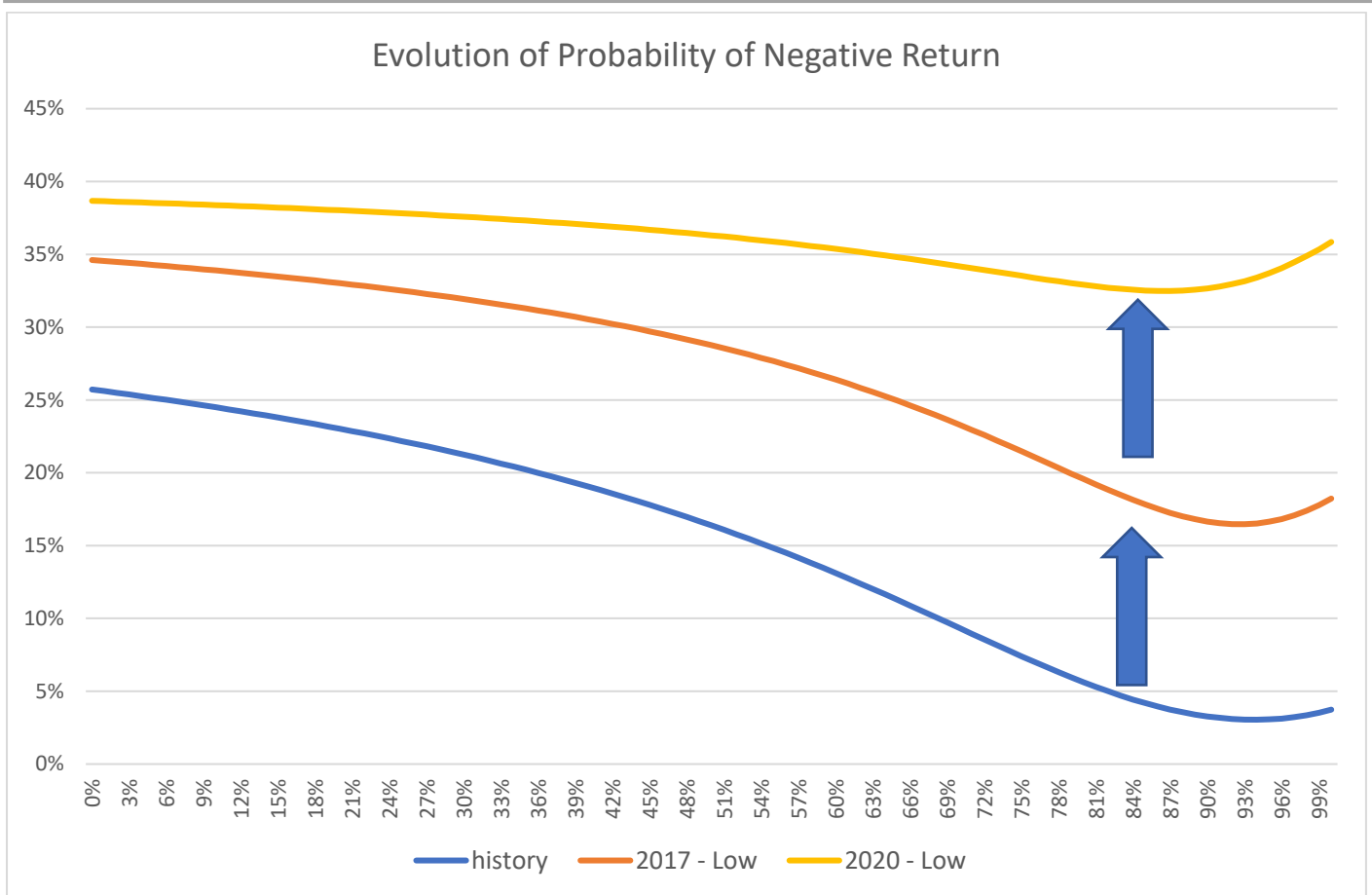
Note capacity to tune probability of negative returns between high (25%) and very low (<5%) by choice of asset allocation.

But what happens if risk free rates go to near zero?

If interest rates are very low, the RR ratio of bonds collapse. The RR ratio of bonds goes from 1.8 to 0.36 (see table 1). Now the RR ratios of shares and bonds are very similar. This means all portfolios to have the similar RR ratios and probability of a negative return.

The chart below shows the transition in the probability of a negative return frontier as base rates have collapsed (blue is historic data from 2012 to 2020, orange is a prospective outlook based on 2017 risk free rates and yellow is based on today’s 1% bond rates).

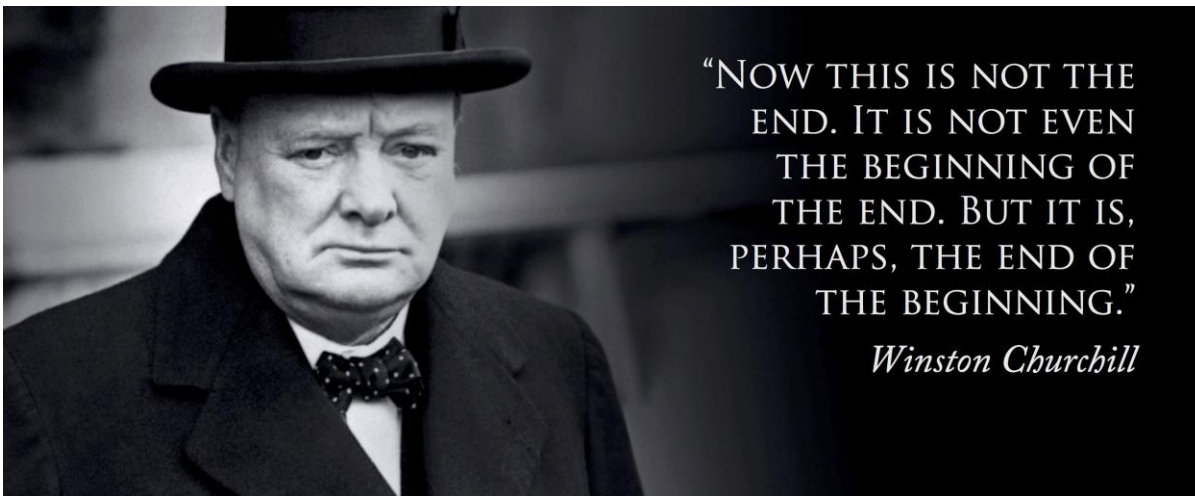
Note that the curve is basically flat. All portfolios have much the same risk of a negative return (they would all in the High category under the standard risk measure).



Key conclusions:

- *There are Significant challenges in maintaining differentiation of investment choices under standard risk measure.* There should be a focus on communicating the size of potential negative returns/drawdowns to members which becomes much more meaningful in differentiating the risk profile of different investment choices.
- *The most valuable assets classes are those that maintain relatively high RR ratios in low interest rate environment.* Vanilla fixed income doesn't deliver any more. Some areas within credit and alternatives probably do. The key challenge is to find assets that offer high yields but aren't just equities in disguise. Key theme music – we think infrastructure debt can offer pretty attractive risk adjusted returns – but it is these types of assets, anything that can deliver reasonable income/yield/return with modest risk, that will be highly sought after by investors.
- *Standard risk measure has always been pretty dumb.* Principally because it's not standard – each fund uses its own asset allocation and return modelling to assess risk and so results aren't comparable between funds. This is going to get even worse as assumptions regarding the risk modelling of alternative assets are going to be the key driver of standard risk measure outcomes and this is the area where there is the greatest variation in modelling approaches and assumptions.

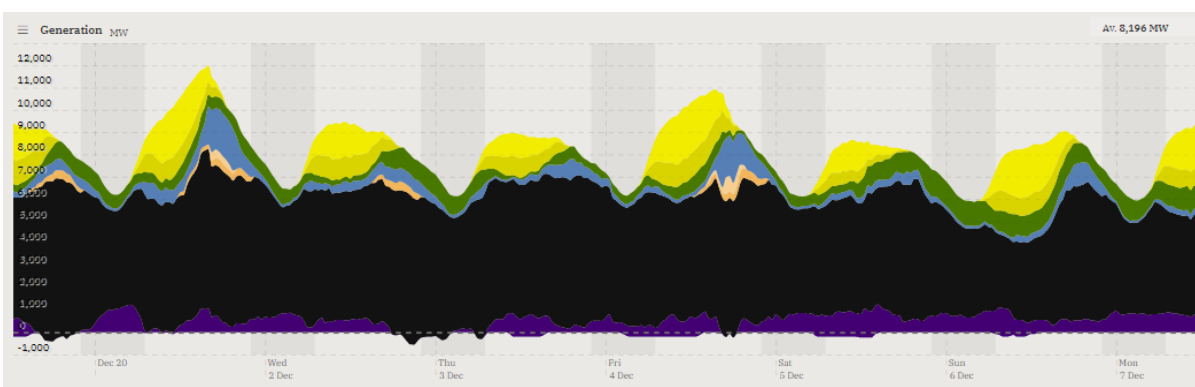
Energy wars – The final showdown



Infradebt has been closely following the renewable energy sector since our inception more than seven years ago (or 28 editions of this quarterly newsletter). In our view, the next two or three years will represent the final showdown in the battle between renewables and fossil fuel based generation. This isn't going to be a smooth friendly transition. It is going to be a fight and there will be casualties on both sides. Investors in any part of the electricity supply chain need to be prepared for the volatility that will come with this final shake out.

While the last seven years have been anything but plain sailing for participants in Australia's electricity markets, the experience to date have been the preliminary skirmishes. The inevitable shadow boxing and testing of defences prior to the real battle getting started. Over this period, renewables have averaged well under a quarter of the energy mix. This means, from a coal plant's perspective it has been reasonably easy to just ease back a bit during the middle of the day or when the wind is blowing and not be too affected by these pesky renewables. For example, the chart below from OpenNEM provides a colour coded view of the supply mix in NSW over a recent week. Black is coal fired generation, the two shades of yellow are rooftop and utility scale solar and the green is wind. The colour coding says it all. The NSW market is currently one dominated by coal where renewables operate at the margin.

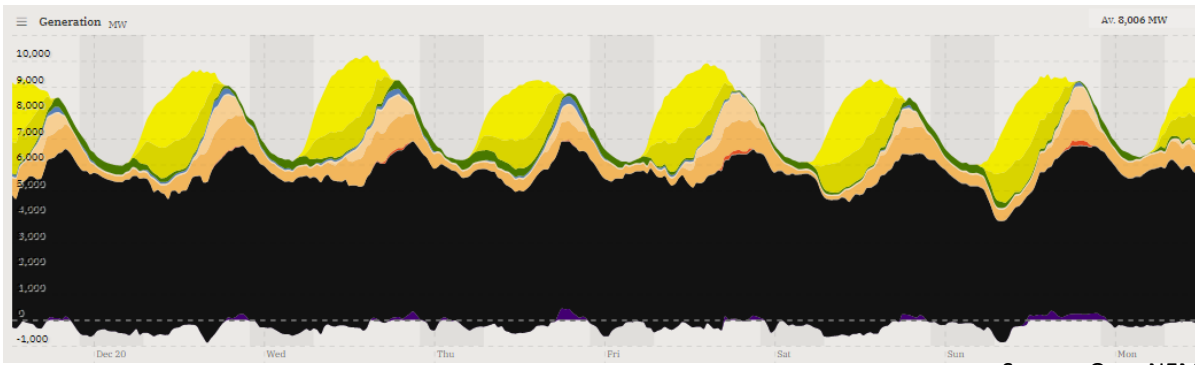
NSW Supply Mix



Source: OpenNEM

But change is a foot and NSW is the market least affected by these changes. Take Queensland, for example, over exactly the same period. Note the dips in black coal production around lunchtime each day as the rampant solar segment (and it is worth noting that rooftop solar is a much bigger player than utility scale solar) forces coal to cut back.

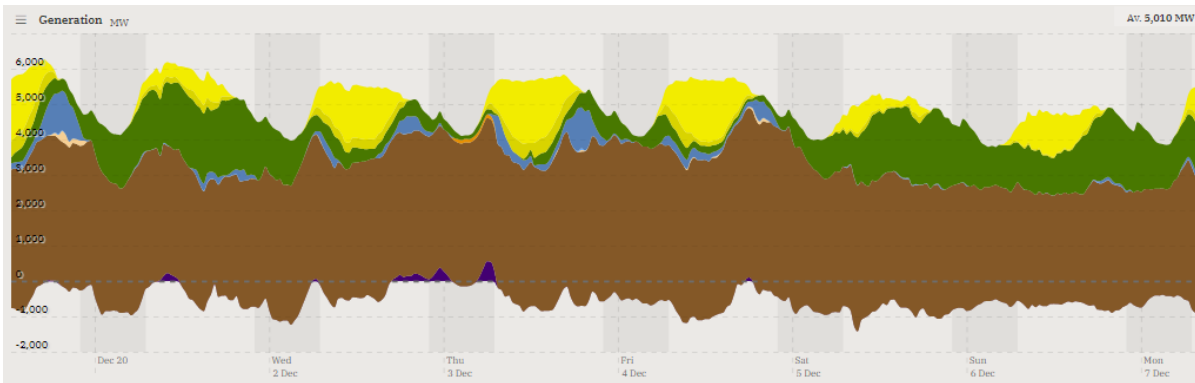
Queensland Supply Mix



Source: OpenNEM

And the same story in Victoria. Note in Victoria, when the wind is blowing (green) it is forcing brown coal to step back (or to export to other states).

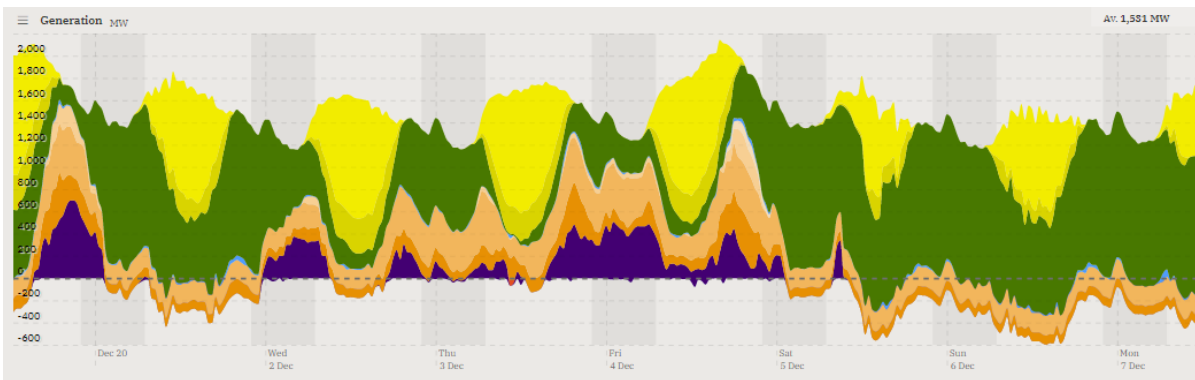
Victoria Supply Mix



Source: OpenNEM

But the key story – of which the previous slides were just a prelude – is that all markets are likely to end up much more like South Australia. That is, the black and the brown is going to disappear.

South Australia Supply Mix



Source: OpenNEM

The rise in renewables to a 25% to 50% share of the market at certain times of day – notably peak solar times – has fundamental implications for how coal plants operate. Coal plants are base load. They are designed to run at near full capacity 24x7 with periodic shutdowns for major maintenance. They are not designed to cut their output to 50% just because it is the middle of the day and rooftop solar is going bananas or because a cold front is passing through South East Australia and wind generation is at its peak. When renewables were small - coal plants could ignore renewables – but now they can't. Renewables have got big.....too big to ignore.

Coal is going to be forced out and it isn't going to be pretty. We know who is going to win. This is a battle between zero marginal cost (renewables) and medium marginal cost (coal \$20/MWh to \$40-60/MWh depending on whether its brown coal or black coal and for black coal depending on coal supply arrangements).

Zero wins this war.

But before supporters of renewables gloat too much – and Infradebt falls into the supporter camp - it is important to remember that renewables will win through low prices which hurts everyone (just renewables slightly less). This is not an agreed exit or a negotiated truce. For renewables plant owners (and this goes to the Winston Churchill reference) what matters is the length of the war. Renewables investors today are vulnerable because whilst they're zero marginal cost, they are still trying to recover their capital cost, whereas coal plant has been written down to near zero (and thus simply need to recover the operating cost). To use a car purchasing analogy – take the situation of a small business verses the backpacker. The small business (renewables) buys a vehicle with the intention of replacing it in time (operating margin has to cover this future outlay/return of capital), the backpacker (coal) buys the car and will drive it until it doesn't work (the cost is sunk on day one)....leaving it on the side of the road when it stops working with no intention of replacing it.

This will be a battle to insolvency.

Coal plants and their supporters will fight. They will fight as if their very existence depends on it. Because it does. Likewise, renewables investors will fight, they hope the battle is short and energy prices recover close to their breakeven price (earn their WACC) before they themselves are outcompeted by cheaper forms of energy generation in time.

Electricity prices will be low and volatile. There will be lots of periods where prices are lower than the cost of coal. There will be significant periods, particularly in Spring, where prices are zero or negative.

There will also be periods of higher prices – most notably in the evening peak (and increasingly in winter – rather than in summer). Coal plants will need to make hay during these windows ... but they aren't going to be able to extract enough profit in these windows to offset the march of low prices during the rest of the day.

Prices will also tend to shoot up after each coal plant closes (or its closure is announced). These spikes will be short lived, with the continued entry of renewables a constant downward force on prices.

More batteries will enter and they will compete with coal and gas in the evening peak – limiting the extent of prices at these times.

In short, investors need to buckle up. We are in the final showdown, renewables are going to win, but there are going to be plenty of casualties on both sides.

Monopoly behavior

The construction of a new solar farm or wind farm often requires augmentation of the transmission network to connect the generator to the grid. This might be a short length of new transmission line or the construction of new substation.

Historically this typically occurred by the new generator building the upgrade (or funding the grid operator to do so) and then gifting completed works to the grid operator. Under connection agreement the new generator will also pay for maintenance of the new works over life of the project via annual connection charge.

Infradebt has seen a new trend where the grid operator insists on building network upgrades itself and then recovering the capital cost of the upgrade through increased connection charges. This effectively converts the network upgrade



from a capital cost to an operating cost. The effective interest rate of the annual charge is mid-single digits. That is, the grid company earns its WACC on the capital tied up in the upgrade works.

This all sounds fine so far. It involves shifting a capital cost from a relatively high cost of capital entity (the generator) to a relatively low cost of capital entity (the grid).

But the sting in the tail is that network company requires the generator to post a bank guarantee for the NPV of the annual connection charges. That is, the network company is effectively earning its WACC on a completely risk free bank guarantee backed 'loan' to the generator to undertake the upgrade works.

What's completely galling about this, is that even if the generator offers to fund the upgrade works itself and gift then to the network company, the network company insists on this bank guarantee backed rentalised arrangement.

In Infradebt's view this is an abuse of monopoly power plain and simple. The networks which do this are using their monopoly power to extract risk free profits out of generators. This pushes up the cost of new generation and, hence, electricity costs for consumers.

This should be called out for what it is. In our view, the AER should crack down on this. Individual generators are unlikely to complain – they are completely dependent on network companies for grid connection approvals – and so are in an extremely weak negotiating position.

There would be a range of ways of addressing this – one example would be to deduct from network company's regulated asset base the amount of customer bank guarantees/deposits. That is, networks don't get to earn their WACC on capital that is effectively provided by their customers.

