

Introduction

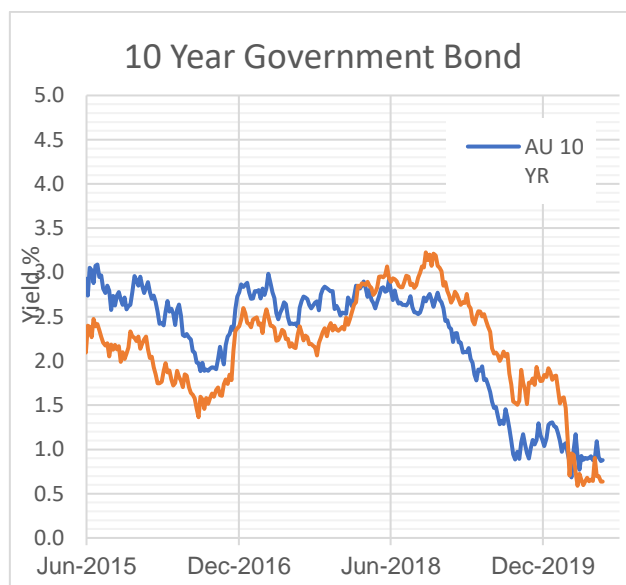
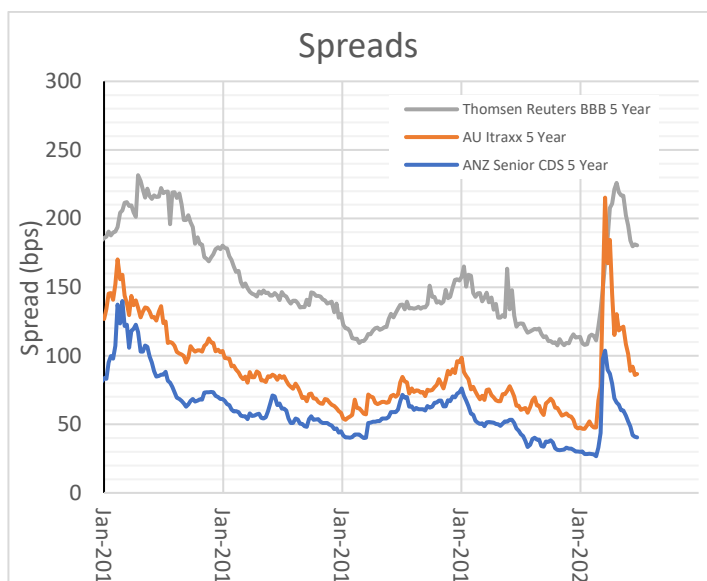
Well, if the end of March was a ‘hold your stomach’ quarter, the June quarter has been remarkable for the ‘ride back out’. Listed equities (particularly in the United States) have come back strongly, but bonds have remained relatively flat and credit remains elevated (albeit down from the April highs). This is against a backdrop of surreal macro-economic conditions – the y axis on many time series charts has had to change significantly in scale (eg Jobless claims in the US). There is a ton of commentary on the status of markets – I think all that’s clear is that no one really knows. So we’ve decided to side step the economic outlook and have decided to stick more with our knitting.

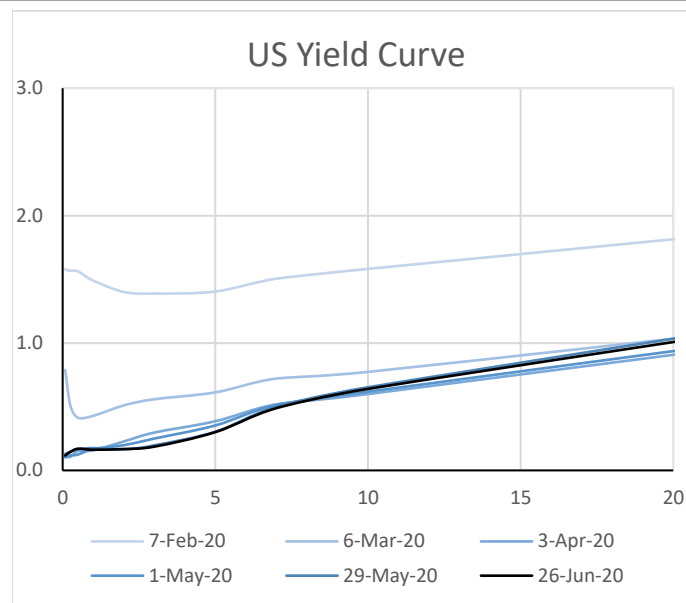
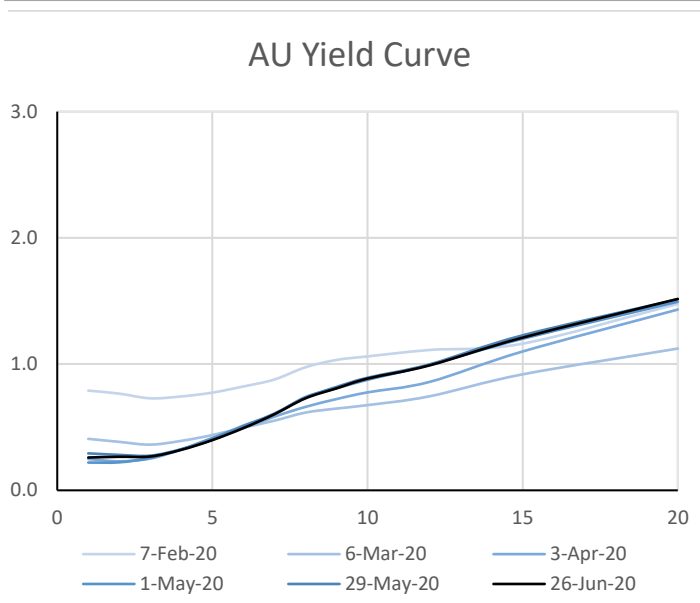
This quarter we take a deep dive into valuations of airports and Sydney airport in particular. We then take a look at inflation forecasts and what it may mean for infrastructure – it may not seem cool, but from where we are today, inflation assumptions really matter. We then look at renewables policy – where we’ve been and where we might be going. Finally – no real analysis – but we’ve picked a few infrastructure Covid-19 charts readers might find interesting.



Markets update

Further to the commentary in the introduction above, the charts below show the credit markets response to Covid-19.





New issuance and refinancing

Not surprisingly there wasn't a lot of transaction activity this quarter.

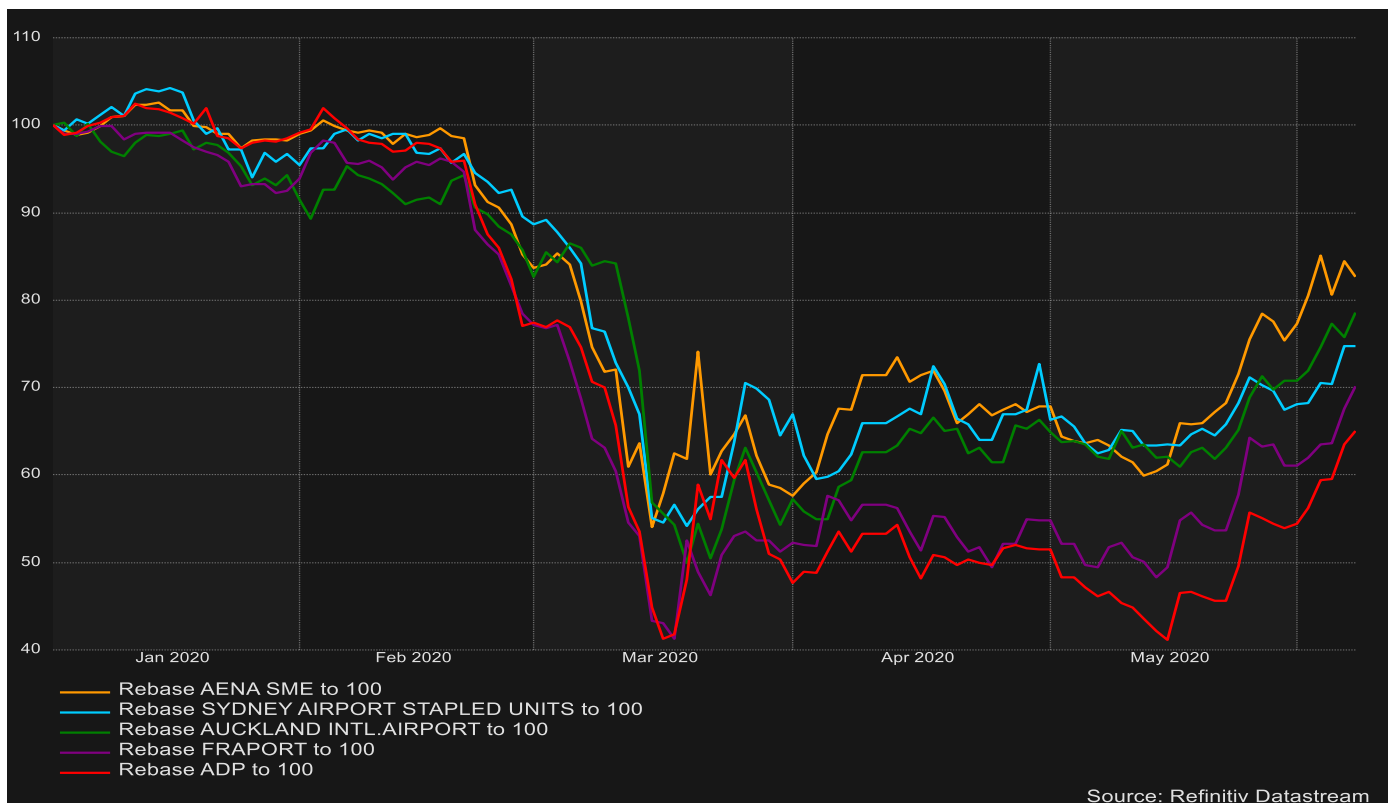
Date	Borrower	Instrument	Size (m)	Term (Yrs)	Curr.
Mar	APA	Loan	694	5	AUD
Mar	Windlab	Loan	20	3	AUD
Apr	United Energy	Loan	245	2	AUD
Apr	Sydney Airport	Loan	850	2/3	AUD
Apr	Scape Urbanest	Loan	1,451	2/3	AUD
Apr	Qube	Loan	200	Not disclosed	AUD
May	Cleanaway	Loan	135	2	AUD
May	Ausnet	Loan	500	2/3/5	AUD
May	ElectraNet	Loan	725	3	AUD
May	Praeco	Loan	267	5	AUD
May	Adani Abbot Point	Loan	250	Undisclosed	AUD
May	Merredin Energy	Loan	43	Undisclosed	AUD
Jun	Photon Solar	Loan	9	Undisclosed	AUD
Jun	Spark Infrastructure	Bond	100	6	AUD
Jun	PARF	Loan	127	2	AUD
Jun	Ichthys LNG	Loan	8,407	8	AUD
Jun	Brisbane Airport	Bond	850	6/10	AUD

Equity and other news

- UAC Energy and Iberdrola are in a takeover battle to purchase Infigen (ASX:IFN). Iberdrola won the backing of the Infigen board at 86 cents. UAC has matched this offer and Iberdrola has fired back with an increased 89 cent offer.
- OPTrust has launched a sale process for its bus business (perhaps ‘infrastructure like’ rather than true infrastructure) with a mooted value of \$1 billion (full business value) and a 10x EBITDA price target.
- Also not strictly infrastructure, but a big deal nonetheless, Chevron has kicked off a process to sell its \$5 billion stake in the north west shelf LNG facilities. Separately Shell has launched a sale process for a 73.75% interest in the infrastructure associated with the QCLNG project in Queensland.
- Hunter Energy is attempting to raise capital to restart the Redbank Power Station in the Hunter valley. The twist in the tail is that they plan to run the power station on waste wood not coal.
- Sunsuper has started a process to sell its small stake in Perth Airport – reportedly offering it to other investors at a 20% premium to its pre-Covid-19 value.
- Staying on airports, early in the quarter Auckland Airport raised \$1 billion to paydown debt and provide liquidity for the Covid-19 shutdown. The raising was at \$4.66 a share a big discount to its pre-Covid share price of around \$9.
- The NSW government has mandated two investment banks for a scoping study for the sale of its remaining stake in Westconnex.

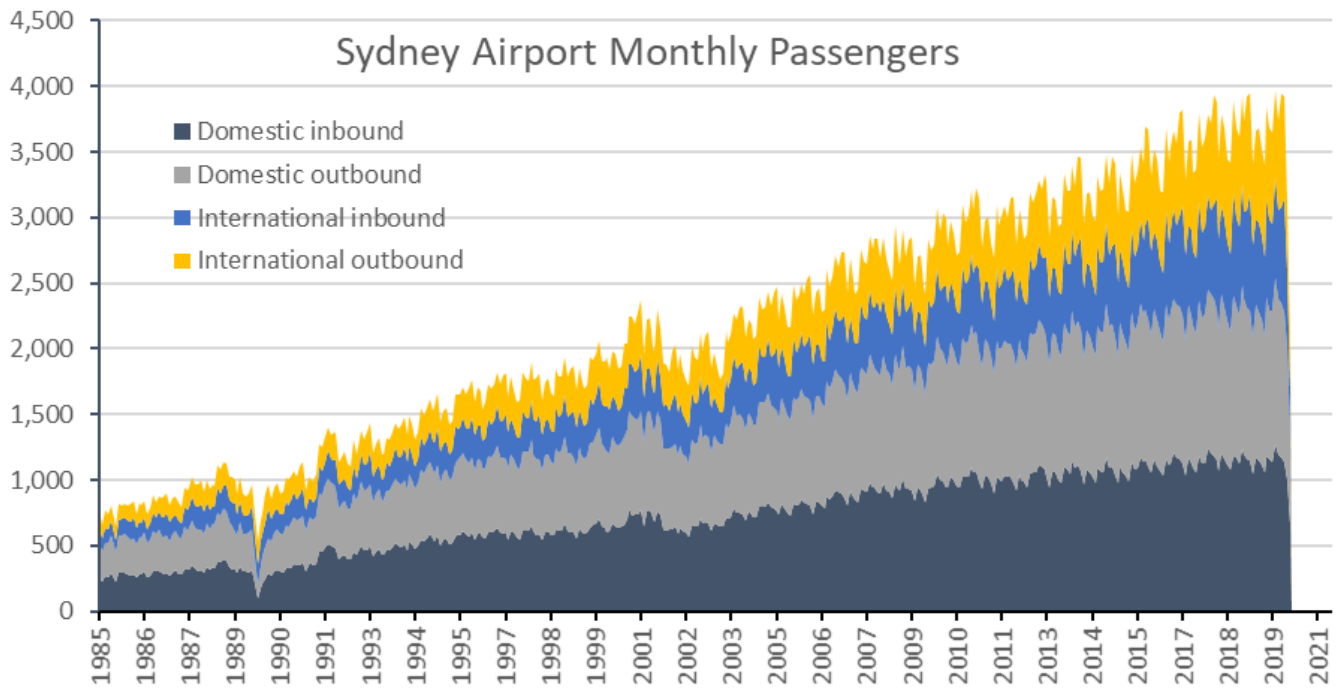
Airports

Airports are considered high quality, low-risk monopoly infrastructure assets. Prior to the onset of Covid-19 the trailing EV/EBITDAC of 20x for Sydney Airport and 24x for Auckland Airport. (EBITDAC stands for EBITDA before Covid!). With the Covid-19 induced closure of international and state borders passenger volumes through the world’s airports have collapsed to near zero. Faced with the reality of no near-term revenues, airport stocks initially fell between 40-60%. Despite no recovery in passenger numbers over the last couple of months, prices have recovered about half of their descent. The share prices of some of the listed airports we track are presented in the chart below.



The monthly passenger statistics reported by Sydney Airport show passenger numbers are down 97% compared to the same period last year. The key question for investors is what does the path out look like?

History provides some confidence that passenger growth will return to long run averages. The largest shocks in Australian's aviation history are the pilot strike in 1989 followed by the 2001 terrorist attacks. Passenger growth at Sydney airport turned mildly negative in the two years that followed 9/11 before returning to trend growth in 2003.



At Sydney Airport, the passenger breakdown is about 38% international and 62% domestic. However, the landing charges for international passengers are about five times that of domestic landing charges. This leads to aeronautical revenues being about 70% for international versus 30% domestic. Similarly, duty free revenues mean that international passengers generate disproportionately higher retail earnings.

Looking at the path out, we see three broad phases:

- domestic air travel is likely to significantly increase with the opening up of interstate borders over the next few months;
- travel with New Zealand is likely to follow (perhaps in the next 3-6 months); and
- broader international air travel is unlikely to restart in any scale until sometime in 2021.

New Zealand is Sydney Airport's (and Australia's more generally) largest international destination at 17% of international traffic. We would expect this route will rebound quite quickly given the high proportion of travel related to visiting friends and family (there are about 500-600k New Zealanders living in Australia) and business travel.

Beyond the Anzac Bubble, the next steps are more tricky. Singapore – with its strong track record of managing Covid-19 and position at no.2 on the list – is a natural candidate. However, many passengers coming to Australia via Singapore are actually just transiting through Singapore and originate somewhere else. A further complication is Covid-19 risks versus geopolitics. The former, would argue allowing Chinese passengers in (and excluding the US) but the geopolitics of Australia taking such a stance seems unrealistic. Rather, a full opening up might require developments on the medical side (testing, treatment or a vaccine) that would then allow a broader opening up of Australia's borders.

2019 top 10 ports by country	% total
New Zealand	17.10%
Singapore	13.86%
China	8.44%
United Arab Emirates	8.22%
Indonesia	8.07%
USA	7.77%
Hong Kong (SAR)	6.62%
Malaysia	5.65%
Japan	3.63%
Thailand	3.28%

When will be the likely restoration of trend passenger growth? Will there be a permanent reduction in travel?

Past episodes, such as 9/11 or the pilots strike, saw passenger numbers rebound to the prior trend over a couple of years. Whether this proves to be the case this time is difficult to forecast and will depend critically on the progress towards effective treatments or vaccines for Covid-19. Whilst ever mandatory 14-day quarantine periods for crossing international borders remain in place, this will discourage all but the most essential international travel. It is hard to imagine the attraction of a week in Bali if it also involves two weeks stuck in a hotel room to get back into the country!

The extended period of lockdown is also changing habits and it is impossible to know what the long-term implications of these shifts might be. From an airport owner's perspective, it is certainly a risk that the rise of video conferencing could undermine the rebound in business travel.

Irrespective, the weak economy is going to hurt discretionary leisure and business activity, and for this reason, we think the odds favour the rebound from Covid-19 being slower than historic episodes.

Valuation

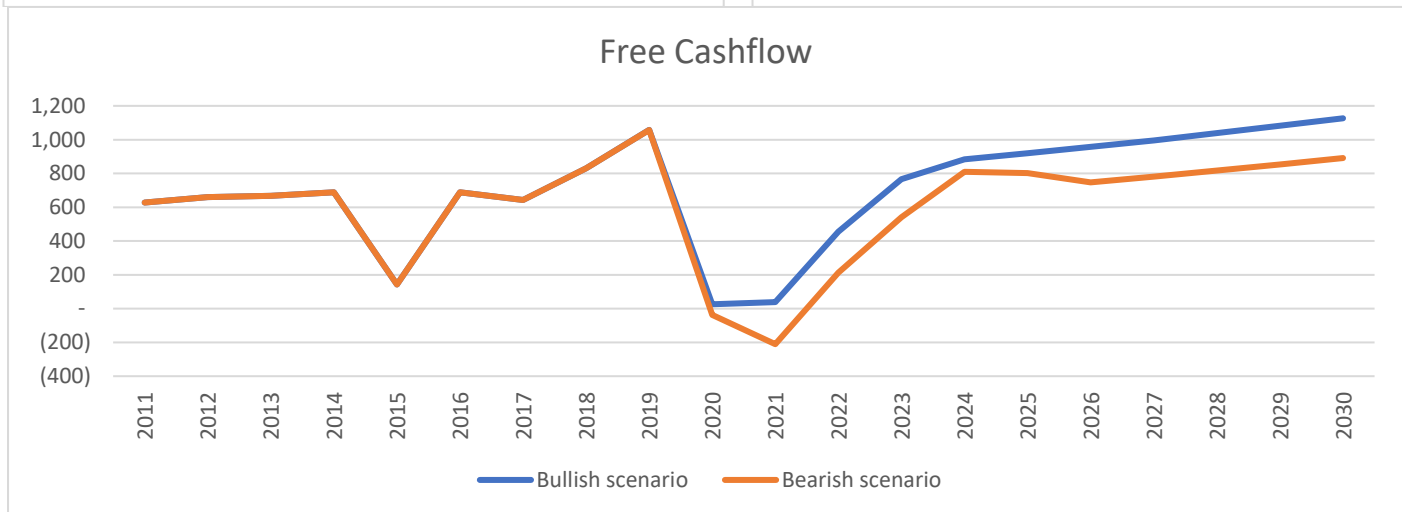
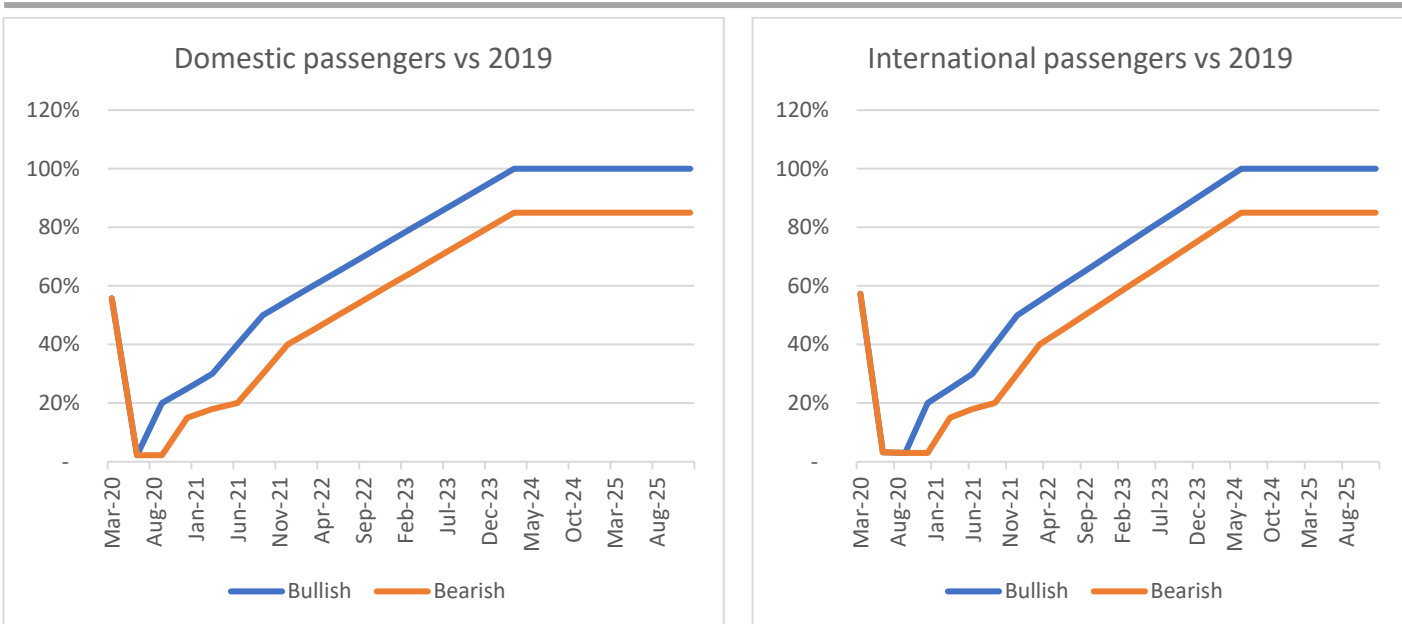
Before reading further – a disclaimer – all readers should know that this newsletter is not intended as investment advice, and that every investor should undertake their own due diligence as to the appropriateness of any investment. Our analysis below reflects our approach to lending – we assess the enterprise value of all assets we lend to through a variety of scenarios to understand supportable levels of leverage.

We have updated our financial model of Sydney Airport to reflect the post Covid world. Our valuation is driven by passenger growth and forecasts 25 years of cashflows. We have assumed an unlevered terminal value of 15x EBITDA of final year cashflows, a WACC of 4.5% and 1.5% inflation. On passenger growth, we have bookended two scenarios – a bullish and bearish passenger growth forecast.

Under the bullish scenario passengers recover to their 2019 level by 2024 and grow at long run growth rates of 1.5%. Essentially this scenario sees Covid-19 as a temporary hit with underlying passenger numbers and profits returning to the original trend.

Under the bearish scenario passenger growth only recovers to 85% of the 2019 level before returned to trend growth of 1.5%. That is, the bearish scenario assumes at 15% permanent loss in passenger numbers compared to the pre-Covid trend.





We note that Sydney Airport has about \$625 million in cash on the balance sheet and undrawn bank lines. It will probably not require an equity raise. The output from our model suggests the following valuation ranges under the bullish and bearish scenarios.

	Infradebt valuation pre-Covid	Bullish case	Bearish case
Enterprise value (\$m)	\$27,922	\$24,883	19,550
Net debt (\$m)	9,236	9,236	9,236
Implied equity value (\$m)	18,886	15,597	10,314
Shares outstanding (m)	2258.6	2258.6	2258.6
Implied share price (\$)	8.36	6.91	4.57
Share price change (%)		-17%	-45%

The current share price around \$5.50 seems to approximate fair value based on the above analysis. However, if the pace of international borders re-opening disappoints, or there seems to be a permanent hit to business travel from video conferencing, this would present clear downside risks from the current share price.

Conclusion

We valued Sydney Airport pre covid at \$8.36 (actual trading price circa \$9.50). The current valuation is probably somewhere between the bearish and bullish scenarios. That is, a \$5.00 - \$7.00 range. On this basis, the current market price at around \$5.50 aligns with our analysis.

While the focus of our analysis is Sydney airport – this analysis is broadly applicable across all of Australia’s airports. It would of course be dependent on the starting valuation and whether it was more conservative than Sydney Airport, but assuming they were marked on a similar basis, we would be expecting unlisted airports to take a valuation hit of around 25-50%. Where individual airports sit within this range will likely depend on two factors, one, the domestic/international split (with the more domestically focused airports proving a safe haven and starting valuation) and two, the more aggressive the pre-Covid valuation (eg Sydney airport), the bigger the fall.

Five Faces of Inflation

The unprecedented monetary response to Covid-19 has sparked a storm of commentary in the financial media (and Twitter) about whether central bank actions will or won’t create inflation. In our view, in the absence of substantial shifts in political dynamics, these arguments are overblown and quantitative easing (and its various cousins) will not result in high inflation. Rather, our expectation is that inflation is likely to be disappointingly low over the next few years – which is a key risk for infrastructure investors, who are often significantly leveraged to inflation. However, before we dive into the reasons for our view, you first need to define what inflation you are talking about.

There are at least five types of inflation worth talking about:

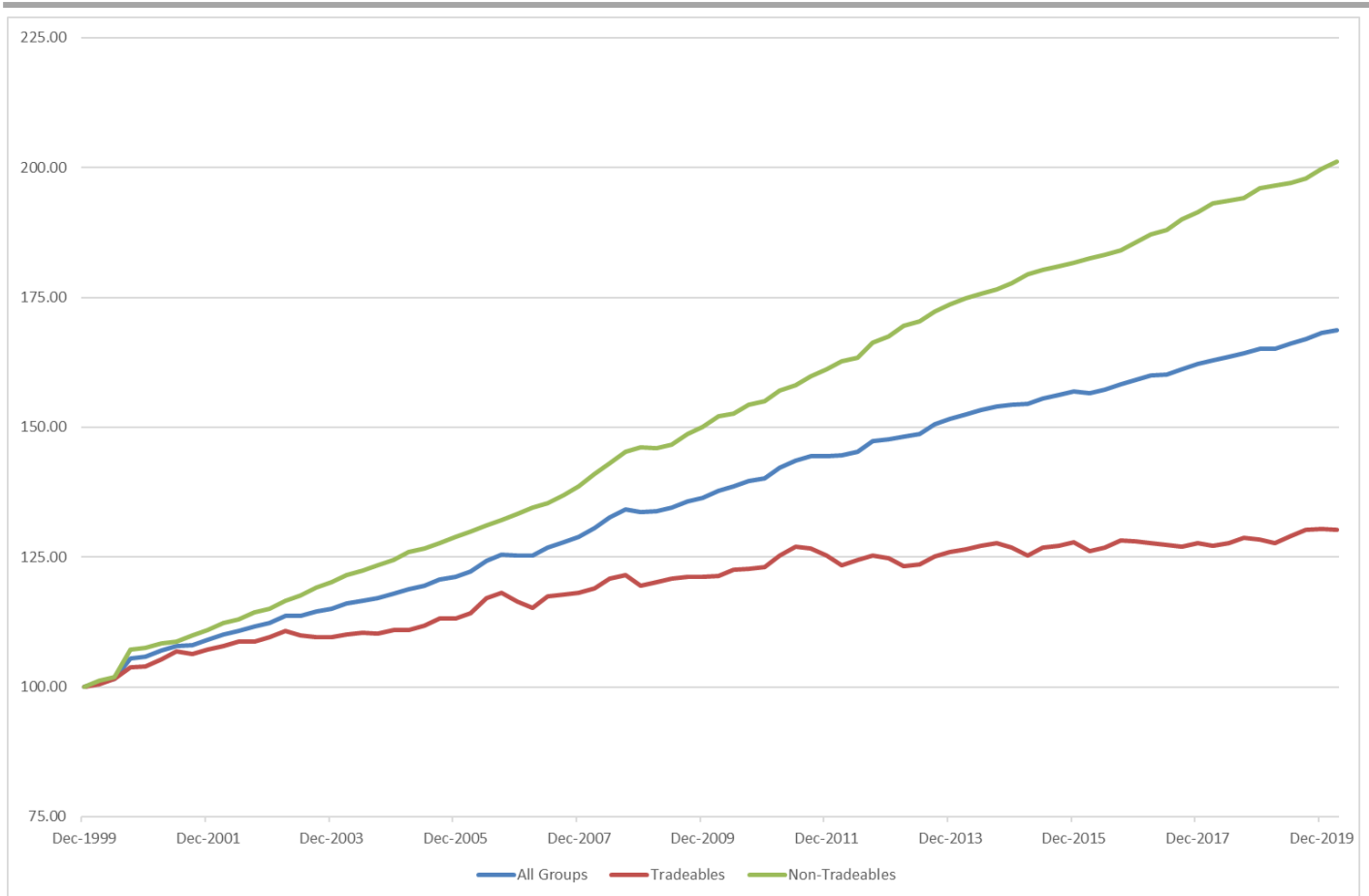
- Consumer price inflation
- Commodity inflation
- Wage inflation
- Asset price inflation
- Exchange rate driven inflation

Consumer Price Inflation

This is the most common measure of inflation. Consumer prices reflect the prices of all goods and services in the household consumption basket. This includes both traded and non-traded goods. Traded goods are those where consumers have the option of buying imports (and local producers have the option of exporting). These will tend to move with exchange rates (and globalisation trends). Non-traded goods are those which don’t need to compete with imports, for example, dry cleaning (it’s not really practical to send your shirts to China to get cleaned). The biggest non-traded good/service in the CPI basket is housing (it is the largest single component of the CPI). Inflation for this component is based on movements in rents and construction costs (luckily Australian house prices don’t flow directly into the CPI).

Globalisation has tended to suppress tradeables prices over the past few decades (see below for cumulative tradeables vs non-tradeables inflation since 1999) – with average tradeables inflation 1.3% lower than the broader CPI. This highlights the suppressing impact of globalisation, and in particular, cheap imports have had on Australian inflation. Similar experiences apply in other developed countries.





Source: ABS

Looking ahead – to the extent that one of the consequences of Covid-19 (and the pre-existing geopolitical tensions between the US and China) – is a reversal of globalisation, this would be expected to feed through as a moderate increase in inflation.

Commodity price inflation

This is a specific form of inflation where increases in raw inputs into production drive up the overall price level. This is usually pretty rare – with some input prices rising sharply but offset by falls in other costs. A classic example of commodity price inflation affecting the broad inflation rate is the oil price shock of the 1970s.

Wage inflation

Labour is the most important input into the production of virtually all goods and services. High wage rises lead to cost-push driven increases in the prices of goods and services. This can lead to a feedback loop where wages increases drive broader consumer price inflation that feeds back into higher wage increases. Inflation in the 1970s was partly a function of oil price shock driven inflation feeding into wages and creating sustained high inflation (rather than just a one-off jump in the price level).

It is very difficult to get sustained inflation without wage inflation. In today’s context, intuitively the very high level of unemployment, which will take years to absorb, should keep a lid on wages and, hence, wage inflation seems unlikely in the short term.

This is a key reason why we think high inflation is unlikely to be a problem in the medium term.

The only caveat to this is that Covid-19 has shone a light on inequality. A key driver of inequality is the unusually low labour share of GDP. One possible fix for inequality would be a substantial increase in wages (perhaps as an outcome of the Gilets Jaunes movement or other populist agenda). With the current high level of unemployment, higher wages

seem implausible, but when thinking about inflation on a long-term basis, we think it is important to be cognisant of this long-term imbalance (and as Stein's Law says, what is unsustainable, must eventually stop).

There are a range of ways these problems could be resolved (and the best bet is that the can will be kicked down the road as far as possible) but resolution of these issues, particularly through Modern Monetary Theory type approaches or Universal Basic Income could be inflationary.

Asset price inflation

Asset price inflation is an increase in the prices of assets (shares/land/houses) rather than consumer goods. There is some link with consumer prices because factories or houses needed to be built and physical cost of construction is a driver. However, many of these assets aren't built (e.g. land) and are predominantly financial assets traded on the secondary market.

Low interest rates (particularly low real interest rates) drive high asset values. This leads to the paradox that Australian wages have grown strongly, in terms of their capacity to buy consumer goods as measured by the CPI over past 50 years, but if you look at those same wages in terms of their capacity to buy a house (i.e. how many years' salary are house prices) then wage growth has been abysmal.

While there has been much debate about the effectiveness of QE in terms of stimulating sustained economic growth or consumer price inflation, there is much less debate that QE and central bank policy has been a key driver of asset price inflation over the past decade. Given the circumstances and experience of the last decade, this seems likely to continue to be a significant influence on asset prices over the period ahead.

Exchange rate driven inflation

This is only relevant in the context of a single country, as exchange rates only affect relative prices between countries. A currency collapse is almost always associated with an inflationary episode. That is, the fall in exchange rate drives up the price of imports (and also drives up the prices of goods that could otherwise be exported). This results in an inflationary episode (think Argentina in 2001/2002 or Turkey in 2018). These events often can be associated with a country being unable to service its foreign debts and suffering a crushing recession (often as interest rates initially go sky high in an attempt to defend the currency).

This is a local phenomenon for the country affected by high inflation (and this usually passes after a year or two as the resulting recession crushes economic activity) and the rest of the world has slightly lower inflation (as cheap exports from the affected country push down prices).

This is a zero-sum game and can't apply on a whole of world basis. While individual countries can use QE/monetary policy in an attempt to drive down their exchange rate (yes I am talking about you New Zealand) it isn't possible for every country in the world to have a falling exchange rate (i.e. the often talked about 'race for the bottom').

Monetary policy and inflation

Monetary policy, and market participants' expectations about monetary policy, are a key driver of long-term inflation outcomes. For example, in Australia the RBA targets 2-3% inflation over the course of cycle. If inflation is running below this, they will tend to cut rates (or keep real rates low) and if inflation looks like it will go above the 2-3% range, then RBA will tend to raise rates. This framework – particularly if the central bank has credibility and acts independently – anchors inflation. That is, wage negotiations are based on assumption that inflation target is achieved (and hence, wage outcomes tend to be internally consistent with the inflation target).

The RBA target is 2-3% over the cycle and average inflation over the period since 1999 has been 2.6%. That is, inflation targeting has largely worked – with market participants treating the inflation target as a credible regime over the past 30 years or so.

Don't Governments want to inflate their debts away?

Often in discussions about long-term inflation trends one of the arguments raised is that governments around the world have large and growing government debt levels and that they will seek to inflate away their debt. Japan is the poster child for this, but the US and much of Europe has seen a step change in government indebtedness post the GFC.

The argument is that for governments with high debt levels there is an incentive for governments to run a higher inflation level and deflate their debt away. The reality is not that easy:

- Higher inflation would feed through into higher interest rates on new government borrowing (and most government borrowing is being rolled/refinanced pretty frequently) and so while a spike in inflation might help in the short term, but unless interest rates can be suppressed, in the longer term higher inflation will feed through to higher interest rates on government debt and, hence, doesn't help the net position.
- It is important to remember that the central bank is just an arm of government. Thus, QE isn't a new source of funding for governments. QE is swapping government bonds (ie long-term debt) for bank reserves with the central bank (effectively short term debt). The effect of QE is to lower the net duration of government borrowing. Thus, QE actually makes it harder to inflate debt away because government borrowing costs become more sensitive to short-term interest rates.
- Even if governments had a financial incentive to pursue higher inflation, they face political constraints as well. In particular, high inflation is politically unpopular. High inflation would be hugely unpopular amongst those on fixed income (namely retirees) as inflation undermines the value of their savings and they wouldn't get an offsetting benefit through higher wages. In this context, Japan is instructive. Japan has massive government debt and has been pursuing unconventional monetary policy for two decades. If inflating government debt away is the "end game" of QE why haven't they done it already?

In conclusion, we are of the view that QE doesn't necessarily produce consumer price inflation and that governments with high debt levels won't necessarily use QE and inflation to inflate away their debts.

Rather a better characterisation of the operation of monetary policy over the past decade or so, is that QE and other low/zero/negative interest rate policies have been deployed in the face of economic shocks and shortfalls in demand. The objective of these policies has been to stimulate demand (by using low rates to bring forward consumer and investment demand) to fill in the demand "hole". Almost by definition, this brought forward demand is smaller than the demand shortfall that policy makers were trying to fix and, hence, did not result in an aggregate increase in demand and, hence, did not create inflation.

Under this thought process, unconventional monetary policy and QE is a response to underlying deflationary pressures and cannot, on its own, produce outright inflation.

To get outright inflation you need either more money/demand chasing limited supply (for example, deficit government spending that exceeds the slack in the economy or outright money printing) or fundamental changes in wage setting arrangements (for example, universal basic income or a complete reset in wage negotiation arrangements in response to concerns about inequality).

In the absence of these radical changes, QE is a response to deflation and in many ways perpetuates a deflationary environment as the bring forward of investment/consumer demand through QE creates ongoing excess capacity and over indebtedness (both of which are deflationary). This indebtedness is a drag on future consumption (more and more income is allocated to debt service than consumption) and thus the cycle continues.

Infradebt Inflation Outlook

It is important to be clear about time horizon:

- **Short (3-12 months).** Covid-19 supply bottlenecks mean there could actually result in price inflation – particularly for necessities whose supply chains are disrupted by Covid-19. A classic example is food.
- **Medium-term (next 3-5 years).** We expect below average inflation. There is likely to be substantial sustained unemployment across the world as well as excess capacity. We would expect continued low wage growth. This



is an environment of low inflation/deflation. The only countervailing force is deglobalisation, but expect this to be more than offset by resource slack. Our view is consistent with bond market pricing – where implied inflation over next 5 years is circa 0.5% per annum – well below the typical 2.5% infrastructure financial model assumption.

- **Long-term.** Fundamentally uncertain. Will depend on if, or how, current imbalances are resolved. One scenario is a world much the same as last 20-30 years (and inflation remains relatively low). Another scenario, for example if MMT or UBI policies were broadly implemented, if that resolution ultimately does involve high inflation (as part of clearing out excess debt but also to reset the labour share of GDP and address inequality). If you think this through though, it requires huge political change from the status quo of today and of the last 40 years – it won't happen without you knowing about it!.

Inflation is Key for Infrastructure Investors

Inflation is a very important return driver for many infrastructure investments. In particular, infrastructure equity returns are usually highly leveraged to inflation. This arises because revenues are often CPI linked, but debt is structured on a nominal basis. This means equity often is 2-3x levered to inflation.

In this context, it is worth noting that many investors adopt internally inconsistent positions. That is, they forecast project revenues on the basis of a relatively high inflation forecast (2.5% is the most common assumption we see) but then use market forward curves to forecast the cost of debt. Given that current market interest rates are between 0% and 1% depending on your horizon, the interest rate market thinks inflation is going to be much less than 2.5% on a long-term basis.

For infrastructure investors the short term is just noise. The key issues are both the medium term and long-term outlook for inflation.

Our view of the medium term is that inflation is likely to be relatively weak and this will be a headwind for infrastructure projects.

Longer term there is significant uncertainty and a key attractive feature for infrastructure projects is that they provide a hedge against future inflation. In particular, compared to equities, infrastructure projects tend to have higher operating margins and much lower labour costs, thus in a scenario where inflation is high and a key driver of this is higher labour costs, infrastructure should outperform equities.

Renewable Electricity Policy

The typical new solar or wind farm project has a forecast operating life of 25 to 30 years. In this context, when looking at the current policy confusion surrounding electricity/emissions abatement policy it pays to take a long-term view. The following table summarises the key phases in the development of electricity and renewable energy policy over the past few decades.

Era	Key Features
1980s and before "State owned era"	Electricity system developed by State government owned electricity companies as an essential service on a vertically integrated basis. No material private ownership of grid connected generation capacity.
1990s "Privatisation and Deregulation"	Creation of national electricity market. Separation of generation, transmission & distribution and retail. Privatisation across broad parts of the NEM (but not everywhere).
2000s "start of renewables – high cost phase"	Renewable Energy Target (RET) introduced. Objective for 20% of generation to be sourced from renewables by 2020. The RET is a subsidy mechanism, funded by electricity consumers, that effectively forces 20% renewable generation into the system (over a 20 year phase in period).

	<p>However, at this point renewables costs are very high (over \$100/MWh on a levelised cost basis) and the initial phase in schedule to the 20% target was very gentle. Thus, very little new renewable generation was built.</p>
<p>2010 - 2015 “start of the climate wars”</p>	<p>An era that started with the introduction of the Carbon Tax and perhaps ended the Warburton review and talk of abolishing the RET.</p> <p>Key points:</p> <ul style="list-style-type: none"> • Carbon emissions were put firmly on the agenda for investors. After this no investor considered a generation investment without full consideration of potential future carbon taxes in the base case. <u>This was when coal based generation became uninvestable.</u> Even if the carbon tax had been abolished – there was no sense amongst investors that this was forever. The world still needs to decarbonise and some future government is likely to put a price on carbon. From now on no rational investor in the private sector was going to make a decision to build a brand new coal plant. • Renewable energy was still very expensive. Given uncertainty and high costs relatively little was built (and Australia was way behind the RET targets).
<p>2015 – 2019 “renewables phase 2 – low cost renewables meets high LGC price</p>	<p>Malcolm Turnbull becomes PM. There is bipartisan deal to retain the RET. LGC prices explode higher to \$80. Energy prices are also pretty high – particularly post the closure of Northam and Hazelwood power stations.</p> <p>High prices for renewable generation – merchant projects were earning \$100-150/MWh on a bundled basis – intersected with rapidly falling construction costs (particularly for solar). Based on short-term prices, projects were extremely profitable, we were seeing projects offering a cash yield on build cost of 15-20%.</p> <p>New renewables development exploded – flooding the market - with the consequence that revenues – both energy and LGCs have subsequently fallen sharply. Falling revenue expectations, grid constraints, continued policy uncertainty, rising EPC costs (on a falling dollar and following EPC failures) have all seen the profitability of new renewable projects decline sharply and, hence, a rapid decline in new projects reaching financial close.</p> <p>In parallel with the renewables boom it has been a challenging era for existing fossil fuel plant. Revenues have fallen – after the short peak around the closure of Hazelwood – as new supply of bulk renewable energy has flooded into the market. Gas and black coal prices have been reasonably high and so this has squeezed the profitability of existing fossil fuel generators. For gas plants, in particular, they have been effectively relegated to only being profitable (relative to fuel costs) during relatively short peak periods.</p> <p>While peak pricing has remained high, prices at non-peak times, particularly during the middle of the day have fallen sharply.</p>

This is a quick run through 30 years of history – but what comes next?

The focus amongst politicians and policy makers has shifted from emissions abatement (RET and carbon tax) to a focus on price/reliability. Interventions, such as Snowy 2.0 and UNGI (underwriting new generation investment) are focused on the subsidisation of new capacity to improve reliability. While the specific projects which receive funding may boost capacity, the net effect is much less certain, as the unclear and uncertain policy framework discourages all investment.

Noting that all forms of utility-scale generation are long-life high upfront cost investments, from an investment perspective, all generation sectors are struggling:

- Renewables – the RET has been met and so LGC prices – in NPV terms – don't provide much of a boost for viability. For many projects it is difficult to secure a PPA that reflects their levelised cost of production.
- Storage – while battery costs have fallen – making storage more viable for some applications (most notably grid stabilisation and short duration activities) – it is still very difficult to make an investment case. In particular, everybody who invests in batteries today needs to consider the risks of competing against the much cheaper batteries that are likely to be available in three to five years.
- Fossil Fuel Generation:-
 - Gas fired plant faces three challenges: gas price risks (gas has fallen sharply in price, but prices aren't expected to stay this low forever), future carbon taxes, and the threat of cheap batteries (many analysts expect batteries to be able to outperform gas plants in 5-10 years).
 - Coal generation plant: as noted above a new build coal fire plant can't compete on a levelised cost basis with other forms of generation in the current marketplace. This is before any concerns regarding any future pricing of carbon emissions.
- Behind the meter solar - the economics of behind the meter solar continue – the cost of equipment continues to fall, but network costs (tariff structures) remain the same, thus network arbitrage continues, and for households, electricity costs continue to fall. For utility-scale generation the net effect of behind the meter solar is to hollow out daytime demand.

All of this suggests an environment where new utility-scale capacity development will slow. At one level, this probably isn't a bad thing, because demand isn't growing (particularly net of rooftop solar). However, if you take a very long-term view and, perhaps add in an optimistic squint (or some rose colored glasses), there are some grounds for optimism:

- The majority of Australia's coal fired generators will need to be replaced in the next decade or so. This should provide an impetus for an improved policy framework.
- Covid-19 and the ensuing economic upheaval will likely reduce the impetus to address climate change in the short-term, but nothing has changed in respect of climate change itself (e.g. temperature extremes in the artic last week), and as the climate situation worsens this will drive policy towards carbon emission reduction.

The political environment regarding emissions reductions is terrible and this is a huge road block on the development of efficient policies to effectively reduce Australia's total carbon emissions. The positive thing is that this is so bad that it is almost inevitable that this will improve over years (and hopefully not decades) ahead.

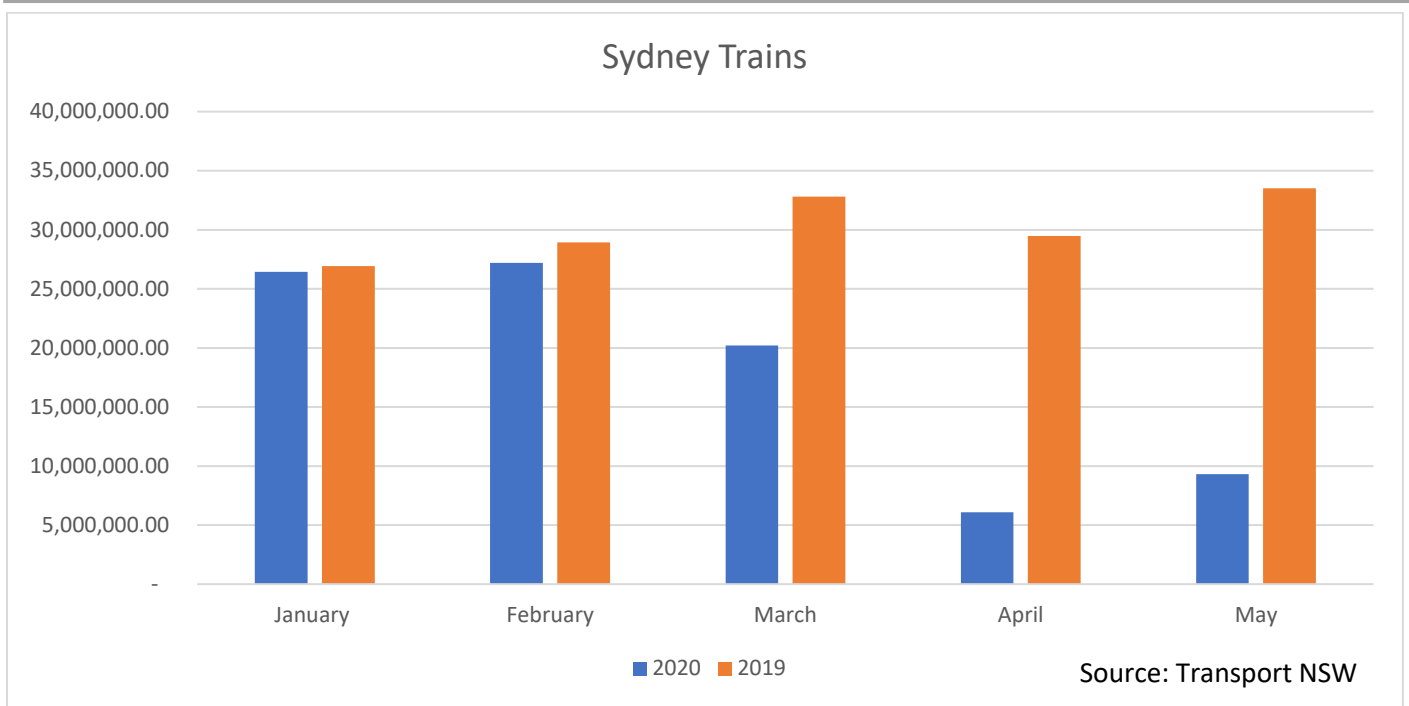
Covid-19 Charts

The last four months have been surreal to say the least. We have all felt some form of step change in our lives. But the nagging question we had as infrastructure investors was, has the change we saw or experienced been reflected in infrastructure patronage/volumes? So here are a range of charts that might interest you.

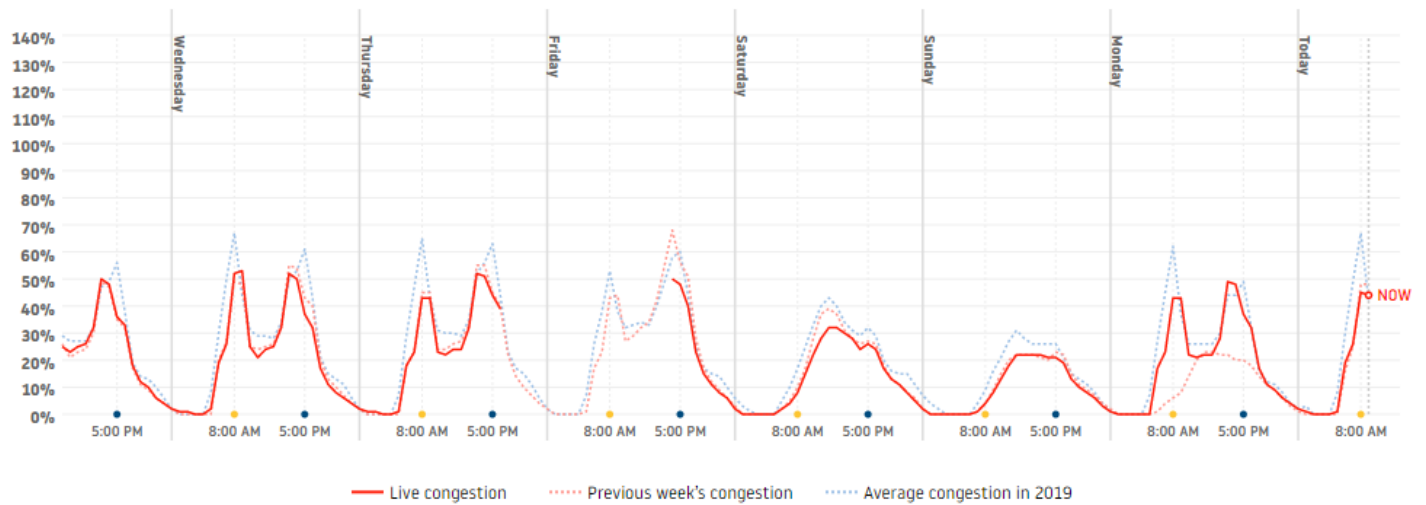
The commute to work

Public transport was crushed due to social distancing and remains well down – Sydney trains patronage is down by circa 75%!



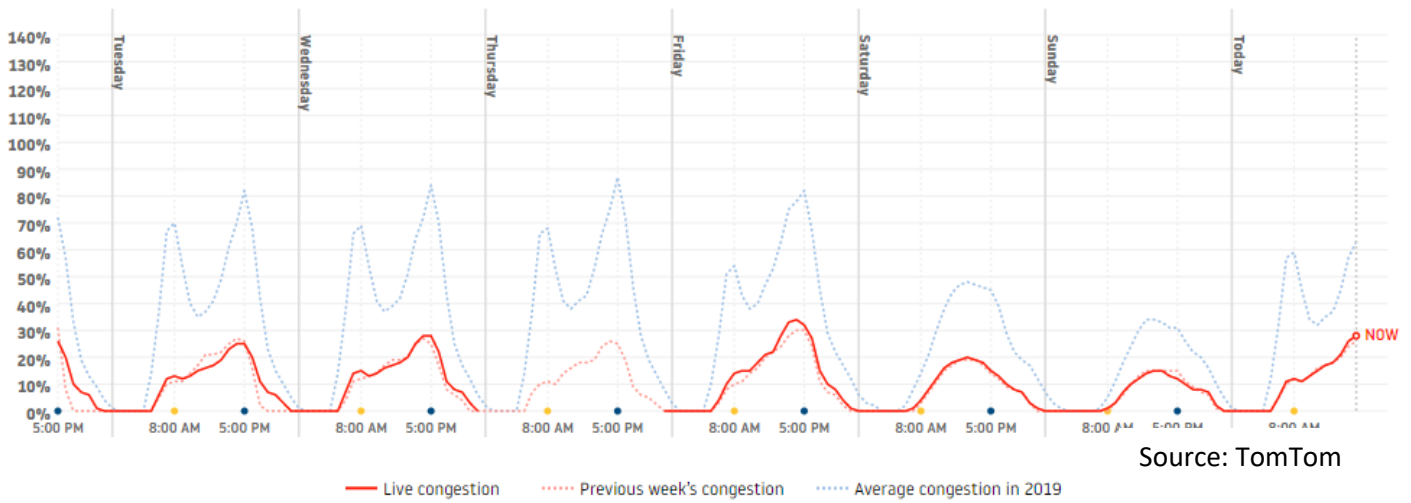


Whilst less people may be in the office – the commute to work by car has returned to misery status. Sydney traffic is largely back to normal in June 2020

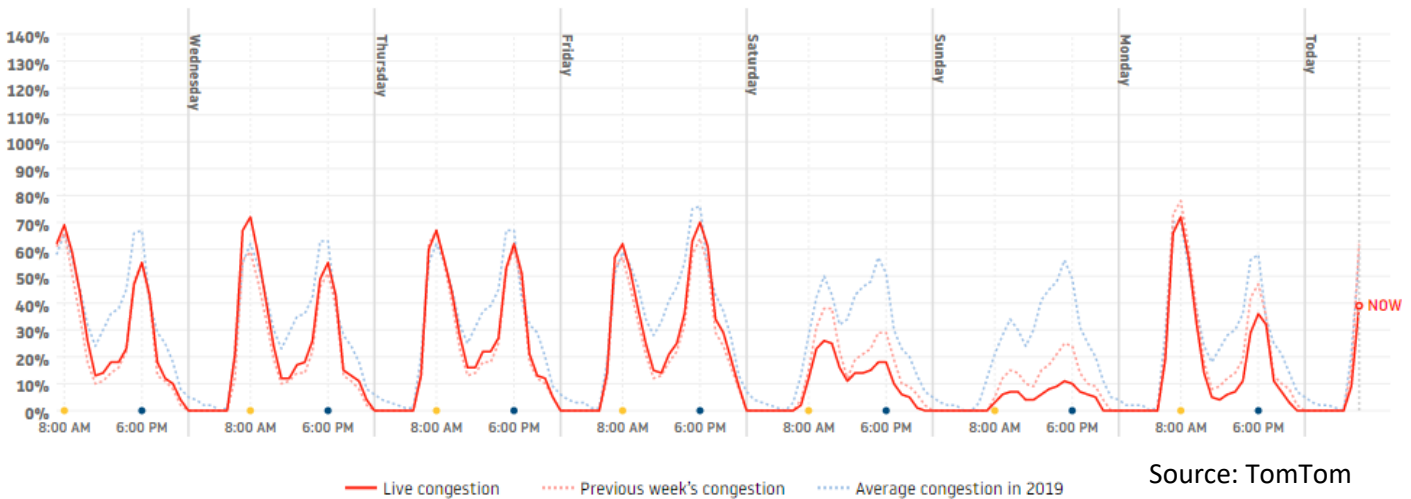


And for comparison you might be interested in traffic in other parts of the world:

Los Angeles – Still way down



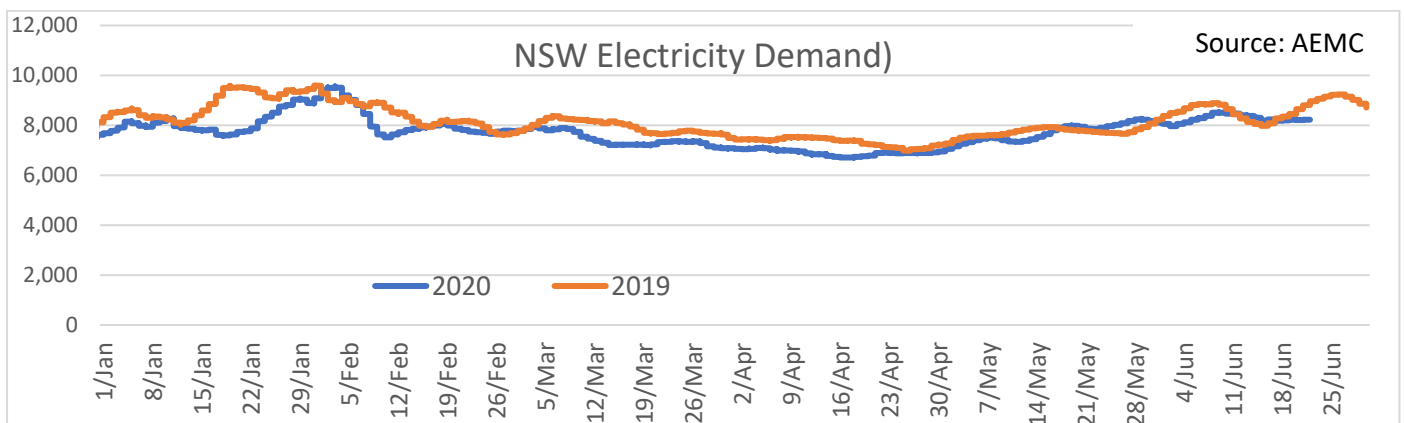
Beijing – Back to Normal During the Week, but still down on weekends



Electricity

You may have thought that all that extra time at home would have crushed electricity demand – but no, all it did was increase household consumption at the expense of commercial and industrial consumption. Aggregate demand is within a few percent of last year.

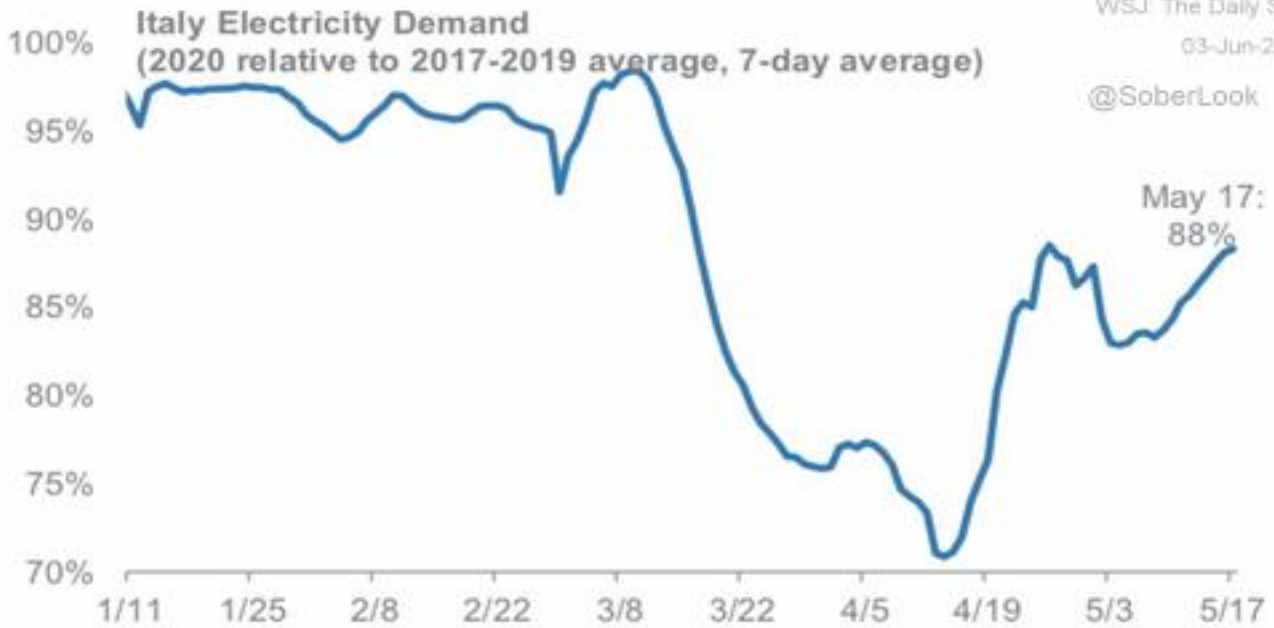
NSW electricity demand:



But this wasn't the case in Italy

Exhibit 15: Italy's power demand now at 88% relative 2017-19 levels

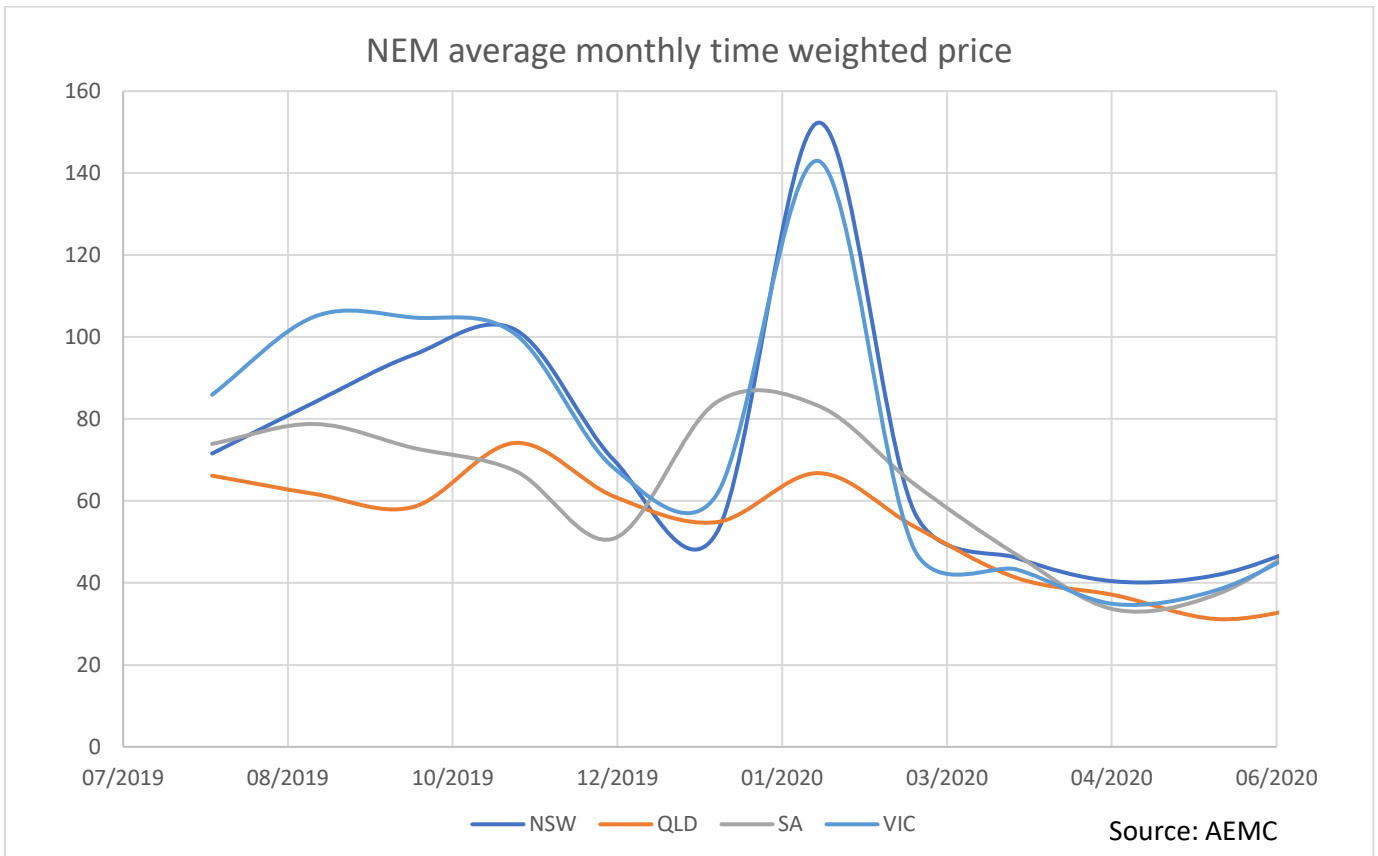
Posted on
WSJ: The Daily Shot
03-Jun-2020
@SoberLook



Source: ENTSO-E, Morgan Stanley Research

What this shows is both the makeup of load (industrial vs commercial vs household) and the crushing effect of full lockdowns on industry in Italy.

But the collapse energy demand generally and its resultant flow on effect on energy pricing generally (in particular coal and gas) has certainly subdued energy prices across the NEM:



Source: AEMC