Realindex Investments

Level 5, Tower 3 International Towers
300 Barangaroo Avenue
Barangaroo NSW 2000 Australia

Telephone 1300 809 204

www.realindexinvestments.com.au

Realindex Note to Clients

Pandemics, Oil and Markets

Mark Twain once said: "It's better to keep your mouth shut and be thought an idiot than to open your mouth and remove all doubt." We do not want to appear in any sense experts in some of the critical emerging themes, or to pretend domain knowledge in (for example) epidemiology. We do, however, feel an urgent need to better understand the human, economic and financial impacts of these themes, to think carefully about our personal and business responses, and to communicate these to our clients.

There is so much uncertainty currently circulating that to make a clear statement of the future, the present or even the near past is very difficult. Part of the problem is that the situation is changing very quickly, and that there is a huge amount of speculation and misinformation, mixed in with high quality data gathering and analysis. (For example, at one point the World Health Organisation (WHO) described social media speculation on COVID-19 as an "infodemic".[1])

We will, however, attempt to summarise the various threads, draw some conclusions and suggest some actions.

Mark Twain also said "I didn't have time to write a short letter, so I wrote a long one instead." While every attempt has been made to write a concise note on this topic, we believe it is important to communicate with clients on this topic quickly rather than refine the message to a shorter note. This note is probably too long, for which we apologise in advance.

Current Themes

There are two related themes currently emerging globally that we want to discuss; COVID-19 and the oil supply dispute. They have serious knock-on effects to economic conditions and to financial markets.

COVID-19

[The Appendix to this paper has some more extensive observations of the virus than appear here.]

COVID-19 is a new coronavirus that emerged late in 2019 in Wuhan in China. Other known coronaviruses are SARS (2003) and MERS (2012), which have considerably higher mortality rates than COVID-19. Other known flu strains include H1N1 (swine flu) and H5N1 (bird flu), which are orthomyxoviruses[2], not coronaviruses.

From what we've learnt, epidemics tend to follow a known pattern of infection, with an exponential-like ramp up followed by a slow decay. Management of the methods of communication of the disease - like less person-to-person contact ("social distancing"), self-isolation, reducing air travel and closing

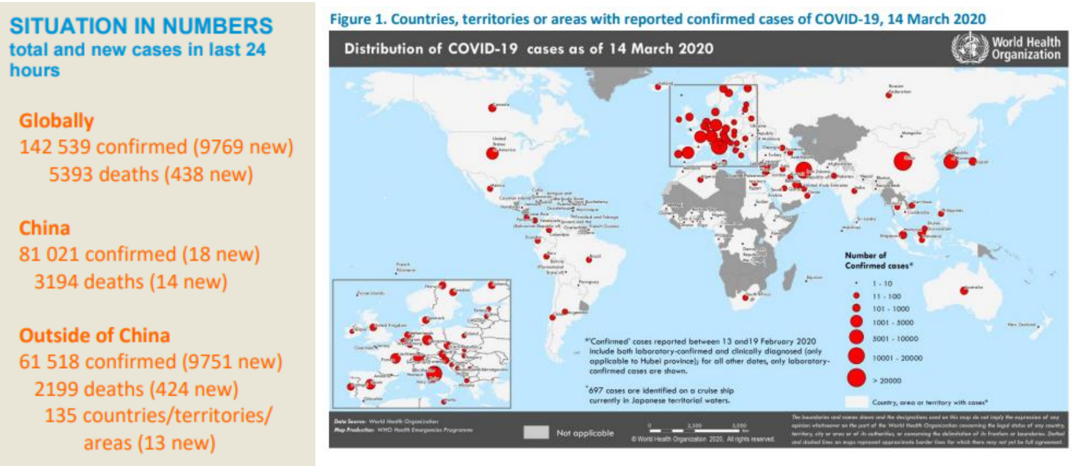
---

[1] https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200202-sitrep-13-ncov-v3.pdf

[2] No, we don't really know either…..

national borders – can slow the reproduction rate. If it is not slowed enough, the health system can be overloaded and other urgent medical treatments (oncology, essential surgery, trauma…) can be delayed or even cancelled in the triage process.

The primary issues with COVID-19 are its rapid spread, its lack of symptoms while infectious, and its mortality rate, especially among older people. While starting in China, COVID-19 continues to spread rapidly, and some countries may still be in the exponential growth stage of the curve. At the time of writing (March 15 2020), the daily WHO Situation Report 54 has the following statistics:[3]



Source: World Health Organisation (WHO)

To attempt to restrict its spread, first China and then other governments and corporates have closed down potential transmission mechanisms, including manufacturing plants, travel and even sporting events. The primary economic effects of these restrictions have been *a dramatic slowdown or shock in demand, significant reductions in tourism and bottlenecks in the supply chain of many consumer and other goods*. These three factors are the main drivers of the current economic slowdown and therefore of falling financial markets.

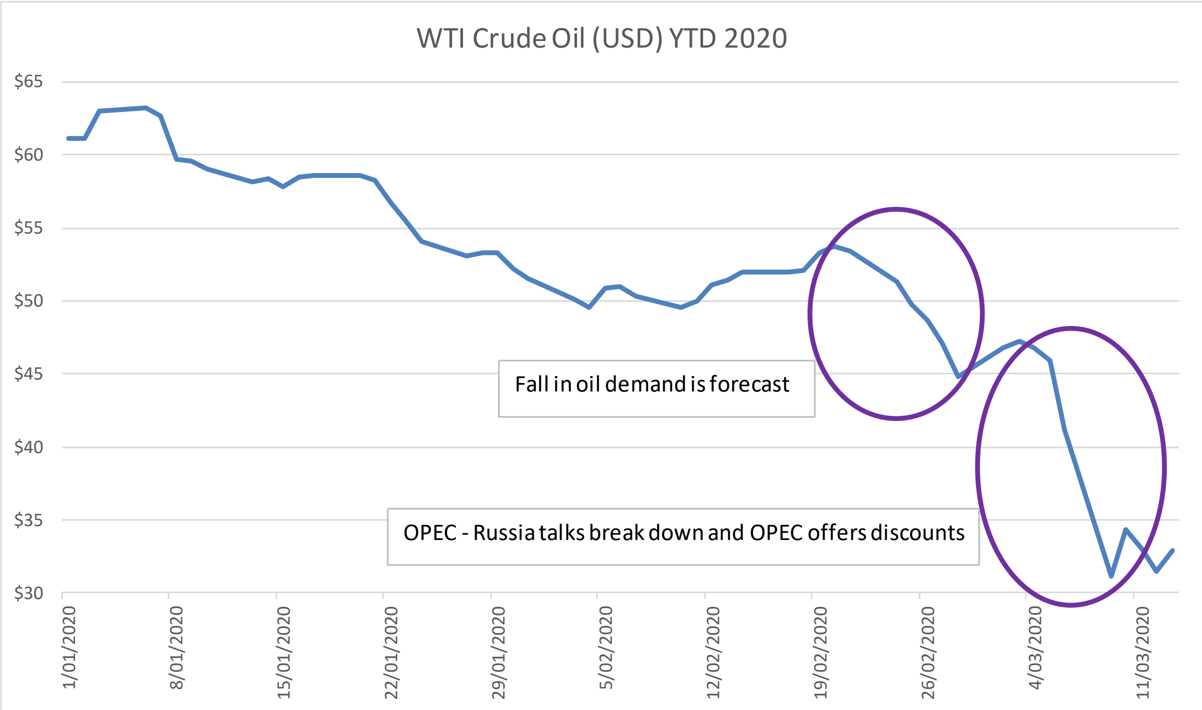
Global Oil Markets

The COVID-19 pandemic (more specifically, the measures put in place to deal with it) started to hit economic growth almost immediately, with energy demand in production and transport falling away sharply in early February 2020. The IEA (International Energy Agency) lowered its forecast for oil demand growth in full year 2020 by approximately 32%, from 1.14m barrels to 0.825m barrels in mid February 2020, which is the lowest oil demand growth since 2011.[4] This led to a further rapid fall in the oil price, further driven down when discussions between Russia and OPEC broke down on March

[3] https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200314-sitrep-54-covid-19.pdf?sfvrsn=dcd46351_6

[4] https://oilprice.com/Energy/Crude-Oil/IEA-Oil-Demand-To-Fall-For-First-Time-In-A-Decade.html

8 2020.[5] This led to OPEC offering sizeable discounts to customers, driving oil prices sharply downwards.



Source: Factset, data as at 16 March 2020.

As this chart shows, WTI Crude is down nearly 50% in USD terms since the start of 2020[6]. There have been two sharp drops –the first due to the reduced demand announcement, and the second, much sharper drop, is when the OPEC-Russia dispute began.

Usually a fall in oil prices is a stimulatory signal for the economy and the financial markets, as lower energy costs increase profitability and corporate investment. However, with the backdrop of dramatically reduced economic activity, the longer term benefits of lower energy costs will have little short term positive effect. Instead, energy stocks have sold off sharply, with the S&P 500 Energy index down 46% YTD. Many constituents of the US energy sector are high production cost shale oil producers, so a lower long term oil price makes their production uneconomical.

---

5 https://www.bbc.com/news/business-51774622

6 At the time of writing

Economic Growth Impact

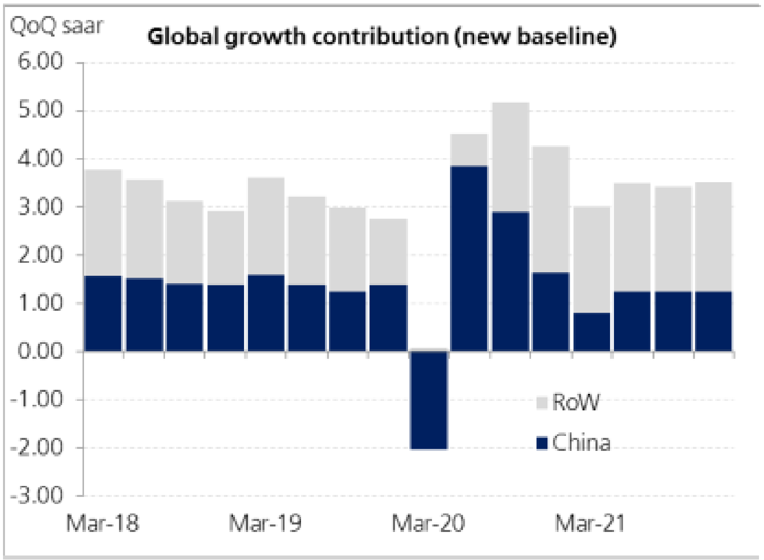
As noted above, the main impacts to global economic growth are forecast to come from *sharp falls in domestic consumption of goods and services, travel related sectors like education and tourism, and supply chain disruption.*

The impacts of these are quite uncertain and the markets are pricing in a very significant economic pullback. The UBS paper[7] discussed in the appendix has attempted to model the impact using a variety of assumptions throughout their economic teams around the globe. These assumptions seem reasonable:

- The virus has stabilised in China
- The Rest-Of-World virus impact is 4-6 weeks away from stabilising
- Chinese economic activity rebounds to normal towards the end of March 2020 (which with supply chain delays implies a 4-5 week dislocation)
- Global travel is disrupted until Q3 2020
- There is no secondary flare up of the virus once contained
- Oil price (Brent crude) remains below USD$40 in 2020

They also postulate that the post-virus recovery will be characterised by a very aggressive monetary and fiscal stimulatory package, especially in China. Using these assumptions, they draw the following conclusions:

- China growth will be very weak in Q1 2020 but then rebound strongly
- Rest-of-World growth will be flat in Q1 2020 and will only bounce back slowly during Q2 and Q3

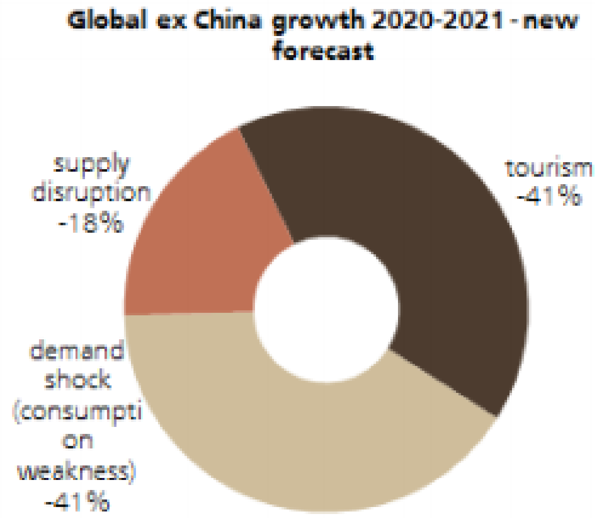


Source: UBS, Haver

---

[7] UBS research note, Kapteyn et al, March 13 2020: *Global Economics & Strategy Pandemic Scenarios for Global Markets – How Bad Could It Get?*

UBS split the composition of these forecasts into our three broad groups: supply disruption, tourism and demand shock. The 2020-2021 splits are given below for Global ex China. The breakdown of the source of the slowdown is mostly driven by a fall in tourism and demand shock. If the impact of the pandemic is deeper or more prolonged than they forecast, then the impact of the supply disruption becomes much more important.



Source: UBS[8]

Finally, we might ask the question: what economic growth expectations are priced into markets at the moment? Equities have sold off dramatically (for example, S&P 500 off 16% YTD, S&P ASX 200 off 25% YTD)[9], bond rates have collapsed and cash rates have been lowered by central agencies, and the USD has run strongly.

UBS use the current market positions to “imply” a global growth rate of about 2% for 2020, well down on expectations at the start of the year and also well below the long term average of 3.5%. Even this may seem overly optimistic, but the expected stimulus following the spread and containment of the virus is very strong.

---

[8] UBS research note, Kapteyn et al, March 13 2020: *Global Economics & Strategy Pandemic Scenarios for Global Markets – How Bad Could It Get?*

[9] Again, at the time of writing

What is Realindex doing?

We are faced with four main issues, which we are addressing:

- Operational continuity
- Staff work environment
- Data provision and accuracy
- Client fund performance

Operational Continuity

First Sentier Investors, Realindex's parent company, has already implemented practices to monitor the situation, maintain business operations and has critically reviewed its regional BCM plans to ensure the business is ready for the potential impacts of the virus on business including on staff, clients and key vendors.

In addition to the regional BCM plans, FSI is also working through detailed operational readiness plans across the teams and functions globally in response to a number of scenarios that COVID-19 may present to staff, clients and our offices. Realindex is especially careful to ensure that all trading, cash flows, investment processes and client-related systems are carefully monitored.

Staff work environment

All Realindex staff have remote access to their work computers and have used that facility extensively in the past. We have had a policy of working from home (WFH) in place for some time, to encourage work flexibility and to plan for the need to manage risk.

It is likely that at some point all team members will be working from home for an extended period. FSI have been testing work from home capacity and are now well placed to move staff to remote working without a loss of critical business services. In addition to this, we have scheduled regular daily calls as team meetings to make sure everyone is in contact and is safe and well.

Our primary concerns at the moment are team welfare and client fund security. Constant contact and checking in with team members is critical, and we strongly believe that in the absence of some catastrophic failure we will see no discontinuity or errors.

Data provision and accuracy

Our data processes perform many checks on consistency and accuracy as part of our normal day-to-day Data Quality Assurance (QA) process. Data loading and processing jobs are run and reports are generated which are emailed to the team and are reported and logged on an internal Data QA website. Any issues are raised and addressed by the Realindex data and systems team.

We have also chosen to work with only the highest quality partners in terms of data provision and service, so we are comfortable that their internal processes are best of breed and have reduced risk to a minimum. However, we are heavy users of data, and need to maintain our "business-as-usual" process structure. With some fragmenting of work processes within data providers (due to different locations, WFH practices and potential illness) we need to be even more vigilant, so regular checks of data provision are even more important and are given a high priority.

In terms of systems, our internal IT team has coverage across all infrastructure and core processes, so while personal internet provider connection delays and drop outs may sometimes occur, our internal systems are robust.

Finally, vigilance of data and IT is heightened in the current environment, with all team members especially careful to check and double check input data like cash flows and corporate actions.

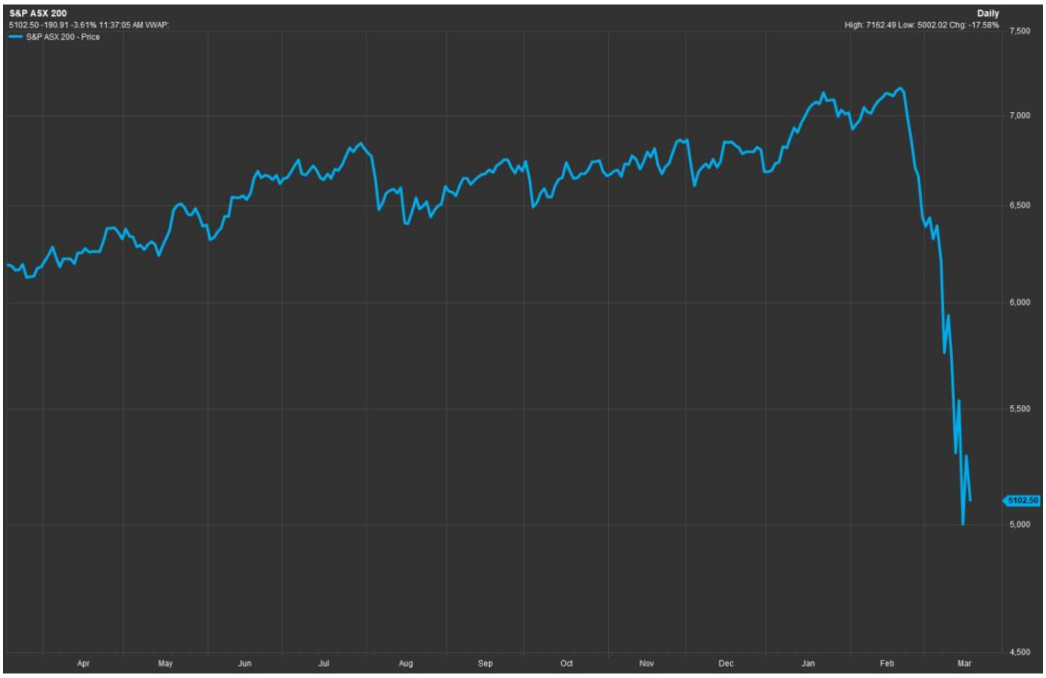
Client fund performance

As expected, fund performance has been extremely volatile over the last month. This has mirrored the total return volatility across different equity markets, and economic risk has increased and forecast growth has fallen. This of course comes off a strong bull market run in stocks on the back of high expected growth, so the markets have in any case have a long way to fall.

Below we summarise market, fund and factor performance for core Realindex investment strategies.

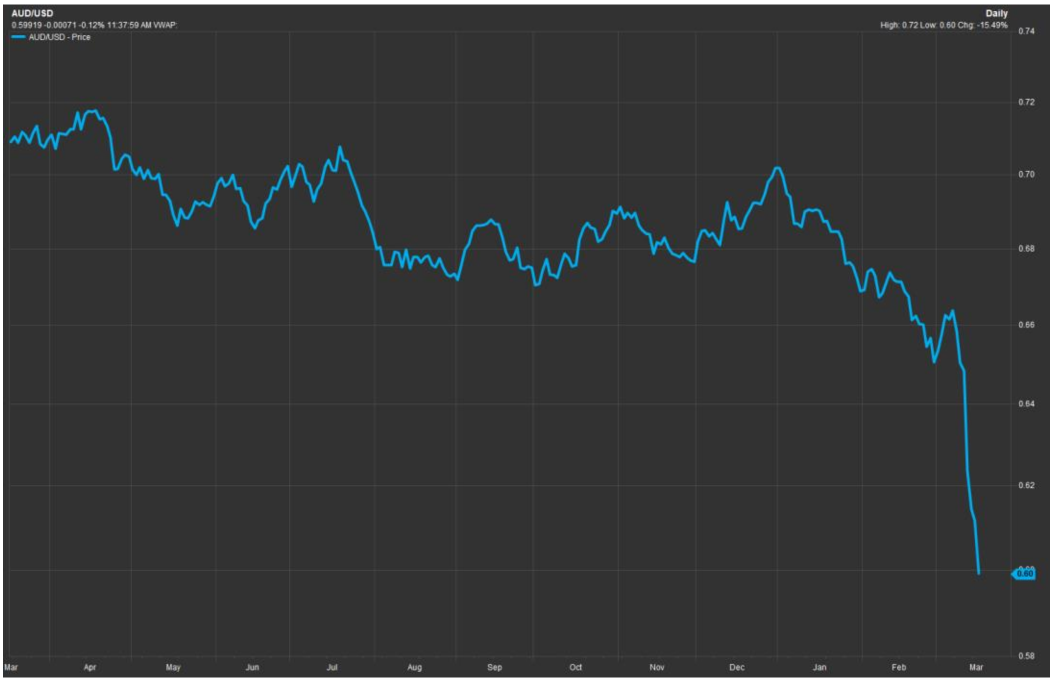
See the Charts below from FactSet. The moves in the ASX200 and AUD have been quite spectacular. Note that the ASX200 is only back to its levels of 2018. AUDUSD at 61c is near GFC lows as the market “flies to safety”, owning USD and gold as hedges. The CBOE Volatility Index (VIX) has run up to at or near GFC levels, but gold has fallen back over the last few days. Oil has sold off very aggressively.

ASX200



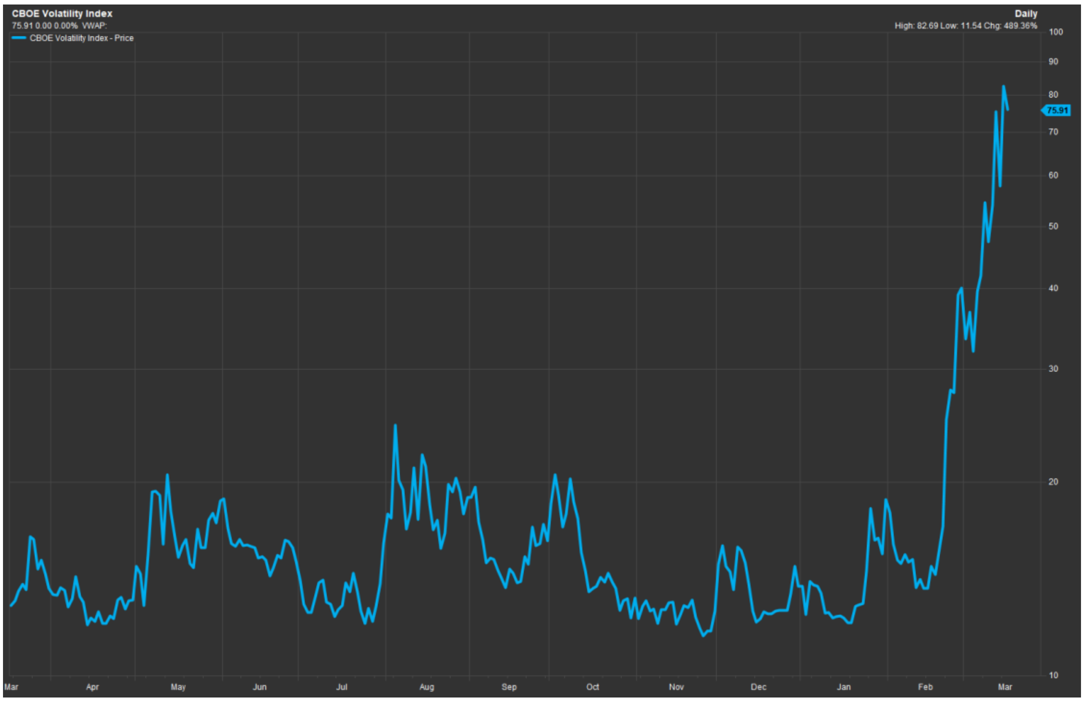
Source: Factset as at 16 March 2020

AUD/USD



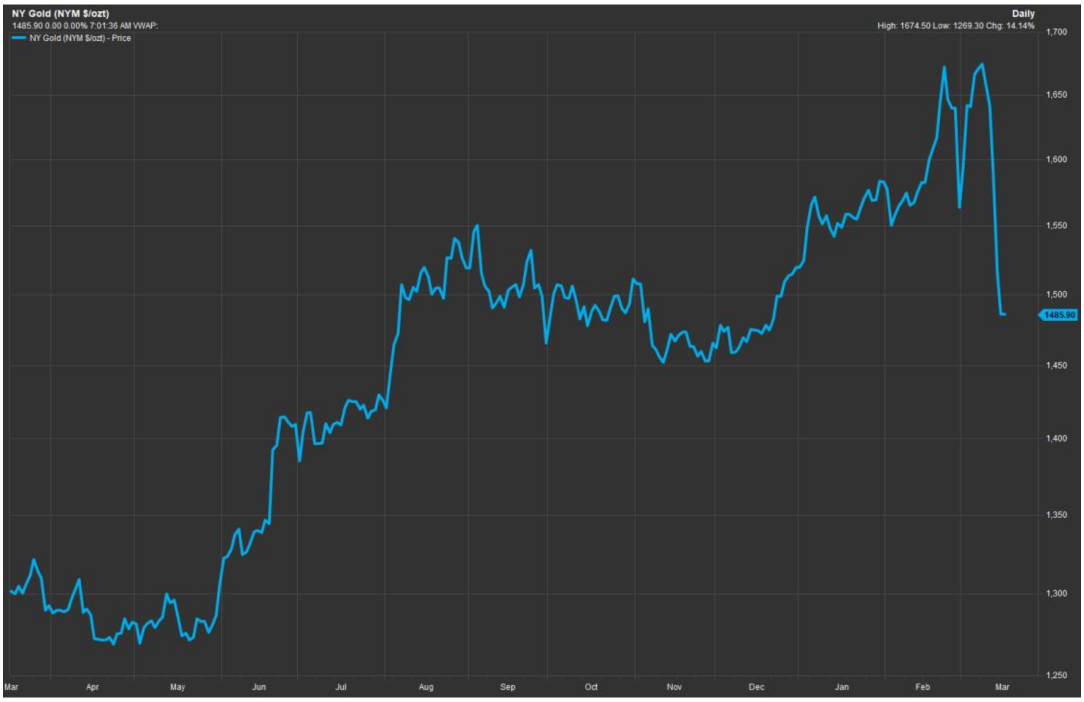
Source: Factset as at 16 March 2020

VIX



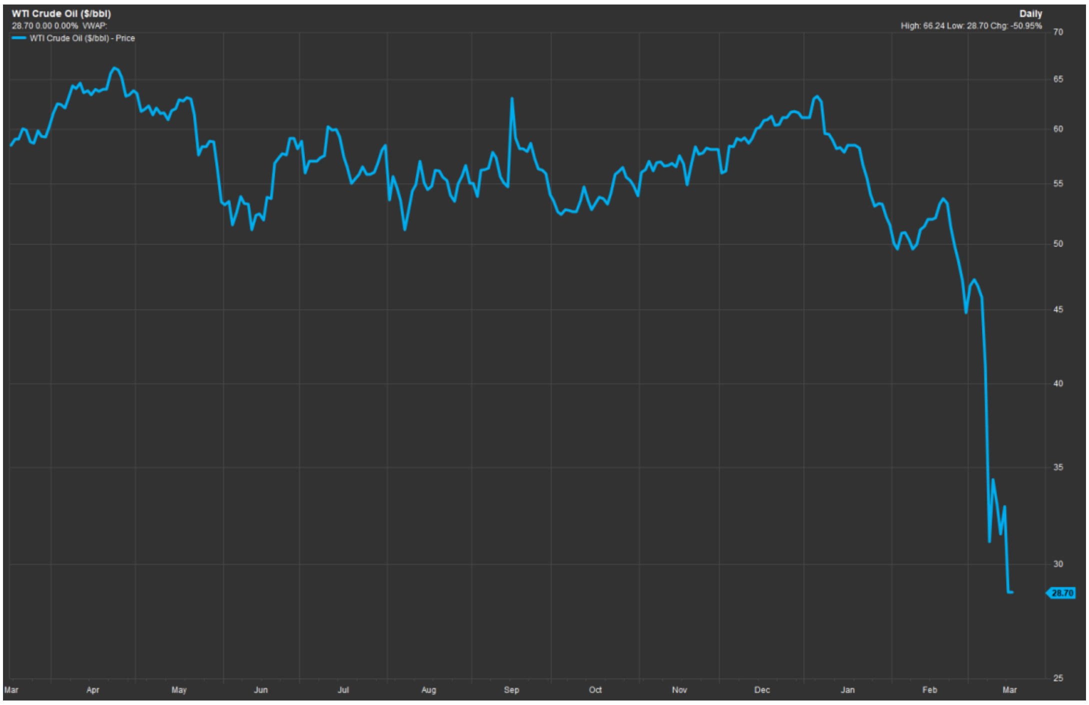
Source: Factset as at 16 March 2020

Spot USD Gold



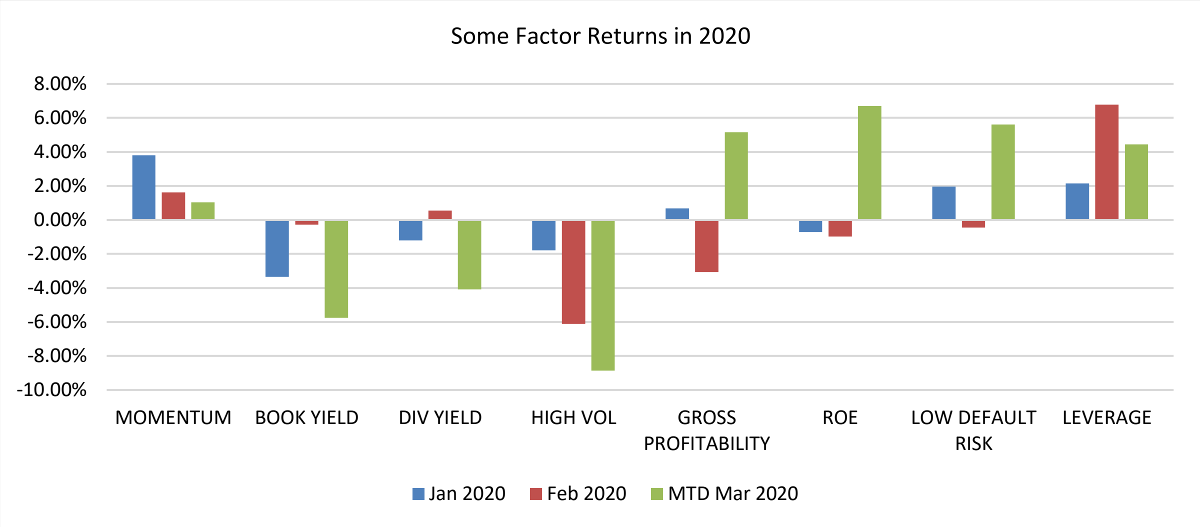
Source: Factset as at 16 March 2020

Spot WTI Crude Oil (USD)



Source: Factset as at 16 March 2020

Market alpha and risk factors have had a very wide spread in returns already in 2020, and exacerbated by the current market conditions. The Chart below shows a sample of well-known factors.



Source: Realindex, data as at 16 March 2020

Momentum continues to perform but it has fallen away. Values factors like book and dividend yield have done badly Month-to-date (MTD) March. Quality (as measured by Gross Profitability and ROE) have been the strong outperformers, while risk has been hit hard (high volatility has sold off, and low default risk and leverage have been rewarded).

Noting that Quality has been a strong performer, one obvious questions is the value add that might have arisen from the Enhancements model used by Realindex to avoid value traps and other undesirable effects that can arise in the Core accounting weighted process. The Table below shows that the Enhancements model has indeed added value in almost all investment universes and over different recent periods.

ALPHA FROM ENHANCEMENTS MODEL			
UNIVERSE	WTD	MTD	QTD
Global	0.01%	0.12%	0.00%
Developed Markets	-0.07%	0.12%	0.17%
Developed Markets Small	0.40%	0.68%	0.48%
Emerging Markets	0.27%	0.50%	0.14%
Australia Large	0.28%	0.56%	0.76%
Australia Mid	0.20%	0.50%	0.82%
Australia Small	0.17%	0.24%	0.50%

Source: Realindex, data as at 16 March 2020. Past performance is no indication of future performance.

Fund performance has been, as we noted, very volatile. Total fund returns have been extremely negative, while active returns have been smaller but also negative, on the whole. The table below gives the returns to Monday 16 March 2020.

	MTD		CYTD	
	TOTAL	ACTIVE	TOTAL	ACTIVE
Australia Large	-21.25%	0.61%	-24.77%	-0.51%
Australia Small	-23.26%	0.38%	-28.37%	-0.46%
Global Unhedged	-18.11%	-2.36%	-21.79%	-5.33%
Global Hedged	-23.60%	-2.67%	-32.59%	-4.82%
Emerging Markets	-12.71%	0.11%	-17.45%	-3.30%
Global Smalls	-25.05%	-1.48%	-31.05%	-4.62%

Source: Realindex, data as at 16 March 2020. Past performance is no indication of future performance.

Returns are obviously dominated by the market selloff. The AUDUSD selloff has also detracted considerably from the Global Hedged portfolio when compared to the unhedged version.

All funds are down in active returns YTD, but a great deal of that underperformance occurred in January, when Value as a factor was hit hard. The broad market selloff started around Feb 19, and since then the active performance has improved somewhat, to the extent that Emerging Markets, Australian Large and Australian Small portfolios have positive alpha in March.

Much of these active returns have been driven by sector and regional positions within the funds, rather than any factor based exposure. The Tables below show the current active sector weights, as well as the performance contribution due to each sector YTD and since the market peak on Feb 19.

In Australian Large Cap, the large Health Care underweight (due mostly to CSL) has been the biggest detractor. Overweight to Financials and underweight to Industrials have both hurt performance, but on the positive side overweights to Communications Services and Consumer Staples have added value. Alpha since the market peak is positive, while it remains negative YTD.

Aus Large			
	Current Active Portfolio Weight	CYTD Contribution	Contribution since start of sell-off (19-02-2020)
Consumer Staples	2.26%	0.59%	0.40%
Communication Services	2.42%	0.44%	0.47%
Real Estate	-0.78%	-0.18%	-0.05%
Health Care	-8.29%	-1.49%	-0.77%
Utilities	2.18%	0.20%	0.17%
Materials	0.02%	0.39%	0.38%
Industrials	-1.38%	-0.43%	-0.09%
Energy	0.84%	0.12%	0.13%
Information Technology	-2.02%	0.07%	0.08%
Consumer Discretionary	1.72%	0.21%	0.15%
Financials	3.04%	-0.49%	-0.37%
TOTALS		**-0.57%**	**0.50%**

Source: Realindex, data as at 16 March 2020. Past performance is no indication of future performance.

In Australian Small Cap, the largest underweights are in Materials (negative contributor YTD but flat since the peak) and Information Technology (small detractor). The underweight to Financials has been a positive contributor, and overweights to Real Estate and Communications Services have been strong positives since the peak. The contribution since the start of the sell-off has been good at 1.78%.

Aus Smalls			
	Current Active Portfolio Weight	CYTD Contribution	Contribution since start of sell-off (19-02-2020)
Consumer Staples	0.59%	0.03%	0.13%
Communication Services	5.02%	0.16%	0.46%
Real Estate	2.90%	0.14%	0.22%
Health Care	-0.84%	-0.03%	0.46%
Utilities	0.54%	-0.01%	-0.02%
Materials	-4.38%	-0.44%	0.07%
Industrials	-0.99%	-0.04%	0.20%
Energy	-0.69%	-0.06%	-0.10%
Information Technology	-3.67%	-0.09%	-0.11%
Consumer Discretionary	3.12%	-0.43%	-0.03%
Financials	-1.60%	0.38%	0.50%
TOTALS		**-0.39%**	**1.78%**

Source: Realindex, data as at 16 March 2020. Past performance is no indication of future performance.

In Global, the large Information Technology underweight and moderate Consumer Discretionary underweight have both detracted YTD, but this has moderated somewhat since the peak. The large Financials overweight has been the largest detractor over both periods. While the post-peak selloff has seen a reduced drag on alpha, it is still negative and few sectors have had positive contribution. The Energy overweight has hurt with oil selling off so strongly.

Global			
	Current Active Portfolio Weight	CYTD Contribution	Contribution since start of sell-off (19-02-2020)
Consumer Staples	-0.15%	-0.08%	-0.02%
Communication Services	-0.41%	-0.11%	0.13%
Real Estate	-0.55%	-0.06%	0.09%
Health Care	-3.86%	-0.22%	-0.24%
Utilities	2.06%	-0.15%	-0.11%
Materials	1.24%	-0.48%	-0.20%
Industrials	0.39%	-0.47%	-0.20%
Energy	1.71%	-0.71%	-0.40%
Information Technology	-6.64%	-0.64%	0.03%
Consumer Discretionary	-0.79%	-1.18%	-0.51%
Financials	6.99%	-1.36%	-0.92%
TOTALS		**-5.46%**	**-2.35%**

Source: Realindex, data as at 16 March 2020. Past performance is no indication of future performance.

In Emerging Markets, spread between the Financials and Consumer Discretionary dominates the active sector positions, and the YTD contribution to both roughly nets off. Communications Services and most other sectors have a performance drag YTD that is either reduced or completely gone since the peak, and the strong performance of the financials overweight has dominated performance.

Emerging Markets			
	Current Active Portfolio Weight	CYTD Contribution	Contribution since start of sell-off (19-02-2020)
Consumer Staples	-1.48%	-0.21%	-0.17%
Communication Services	-3.12%	-0.89%	-0.46%
Real Estate	1.54%	0.20%	0.26%
Health Care	-2.90%	-0.34%	-0.19%
Utilities	1.20%	-0.36%	-0.19%
Materials	3.25%	-0.50%	-0.21%
Industrials	2.13%	-0.39%	0.03%
Energy	1.40%	-0.08%	0.08%
Information Technology	-0.53%	-0.36%	-0.04%
Consumer Discretionary	-8.46%	-1.10%	-0.55%
Financials	6.98%	0.79%	1.29%
TOTALS		**-3.24%**	**-0.15%**

Source: Realindex, data as at 16 March 2020. Past performance is no indication of future performance.

In Developed Markets Small Cap, sector active weights are quite a bit larger than the other strategies, and Industrials, Energy and Consumer Discretionary have been large detractors YTD. Performance since the peak has still been negative, although less, with the same sectors performance improving.

Developed Smalls			
	Current Active Portfolio Weight	CYTD Contribution	Contribution since start of sell-off (19-02-2020)
Consumer Staples	1.52%	-0.06%	0.06%
Communication Services	-0.20%	-0.16%	0.04%
Real Estate	-4.15%	-0.66%	-0.41%
Health Care	-7.93%	-0.33%	-0.27%
Utilities	1.75%	0.07%	0.07%
Materials	1.59%	-0.15%	0.04%
Industrials	1.99%	-1.18%	-0.85%
Energy	2.68%	-1.22%	-0.50%
Information Technology	-5.90%	-0.31%	0.08%
Consumer Discretionary	3.79%	-0.92%	-0.22%
Financials	4.85%	-0.09%	-0.27%
TOTALS		**-5.01%**	**-2.23%**

Source: Realindex, data as at 16 March 2020. Past performance is no indication of future performance.

Finally, the Global and Developed Smalls strategies have significant regional tilts which have had a marked contribution to performance. The large US underweight and large Europe overweight have dominated negative performance YTD and continue to do so since the peak. This is true for both Global and Developed Markets Small Cap.

Global			
	Current Active Portfolio Weight	CYTD Contribution	Contribution since start of sell-off (19-02-2020)
Europe	4.97%	-1.70%	-1.22%
Japan	3.60%	0.00%	0.23%
Emerging Markets	3.45%	-0.45%	0.06%
UK	1.11%	-0.57%	-0.41%
Developed Asia	0.69%	0.01%	0.05%
North America	-13.82%	-2.74%	-1.06%
TOTALS		**-5.45%**	**-2.35%**

Source: Realindex, data as at 16 March 2020. Past performance is no indication of future performance.

Developed Smalls			
	Current Active Portfolio Weight	CYTD Contribution	Contribution since start of sell-off (19-02-2020)
Europe	2.89%	-1.24%	-0.87%
Japan	2.16%	0.10%	0.36%
Emerging Markets	0.07%	0.01%	0.01%
UK	-0.60%	-0.45%	-0.37%
Developed Asia	-0.04%	0.08%	0.26%
North America	-4.48%	-3.50%	-1.60%
TOTALS		**-5.00%**	**-2.21%**

Source: Realindex, data as at 16 March 2020. Past performance is no indication of future performance.

We have tried here to cover a few different bases. Hopefully, the reader is now better aware of the current situation of the spread and impact of COVID-19, the oil price war that erupted in its wake, and the economic impacts that follow. These economic impacts seem to centre on the breakdown of the supply chain (especially out of China), the shock to demand due to the physical response to the virus, and very specifically on the drop in tourism. While markets have sold off heavily, and global economic growth has been curtailed in the medium term, it seems to us that once this passes the recovery will be significant.

Realindex strategies had a difficult first 6 weeks of the year, and since the market peak on 19th of February has been mixed (on a relative basis) across the strategies with some performing better than others. However, the performance of risk and quality factors highlights a rotation to safety with equities, and strongly justifies the use of the enhancements model.

As a business, Realindex continues to be focussed on team welfare and client fund outcomes as its highest priorities, and we have put in place processes to reduce personal and business risk.

APPENDIX: Some Observations on COVID-19

Two critical measures of any disease are its rate of reproduction and its mortality rate.

The rate of reproduction is called R_0 ("R-naught"). It refers to the number of people who catch a disease from a single carrier. For example, measles has an R_0 of 12-18 and smallpox 5-7. That is, for each person that has measles, on average 15 people will catch it in a population *where everyone is susceptible*. COVID-19 has an estimated R_0 of between 2 and 2.5 according to WHO[10] (this is greater than influenza), although this may be under- or overstated by a lack of testing. SARS (from 2003) has an R_0 of between 2 and 4. A value below 1 suggests the disease is under control.

A key concept is what is known as the Herd Immunity Threshold (HIT). It is the "proportion of the population that needs to become immune before an infectious disease becomes stable in the community".[11] In other words, the higher the HIT, the greater the proportion of the population is infected, and the greater is the strain on the health system.

HIT approximately behaves like $1/(1- R_0)$. So reducing R_0 has the impact of lowering HIT as well.

The reproduction rate of a disease is only one part of the story. More important is the mortality rate, which is of course the proportion of people who perish having caught the disease. For COVID-19, this can vary considerably, probably because of an understatement of people who actually have caught it. Unlike SARS (mortality rate approximately 10%), where people who caught the disease were immediately ill and in most cases admitted to hospital, the actual number of people who have caught COVID-19 is unknown as they often do not become ill enough to need medical treatment.

JP Morgan research have collected data on known mortality rate in a recent publication.[12] There is considerable variation.

COVID-19: Countries with over 1,000 infections

Number of people, %

	Infection	Death	Mortality rate
China	80,793	3,169	3.92%
Italy	12,462	827	6.64%
Iran	9,000	354	3.93%
Korea	7,869	66	0.84%
France	2,284	48	2.10%
Spain	2,277	55	2.42%
Germany	1,966	3	0.15%
US	1,312	38	2.90%

Source: John Hopkins, J.P. Morgan. Mortality rate = death/ infection.

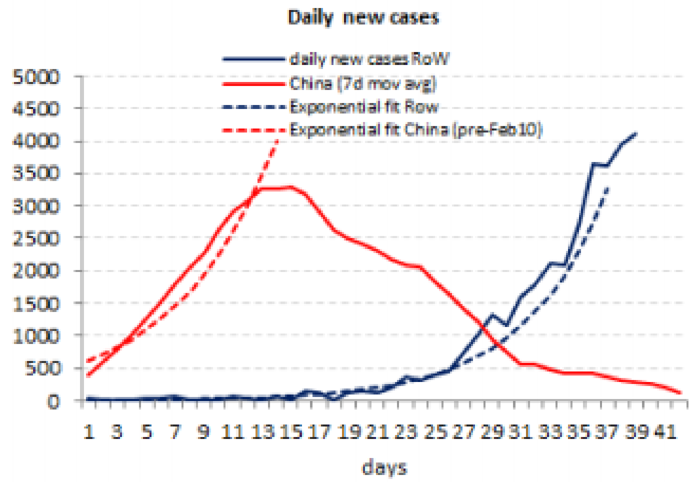
[10] https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200306-sitrep-46-covid-19.pdf?sfvrsn=96b04adf_4

[11] https://www.healthknowledge.org.uk/public-health-textbook/research-methods/1a-epidemiology/epidemic-theory

[12] JP Morgan research note, Kim et al March 13 2020, *COVID-19 Update: Pandemic Pandemonium*

UBS have produced a useful note discussing COVID-19 and its impact.[13] They make the point that infection rate growth looks exponential at the start but then treatment, prevention or immunity cause it to decay away. These charts are characteristic of the behaviour of epidemics and relate to the R_0 of the disease as noted above. The chart below shows the historical plot of new cases for China since Jan 20th 2020, and the same plot for the rest of the world. Both are overlaid with equivalent exponential growth rate charts.

Figure 4: Growth can be exponential until it's not

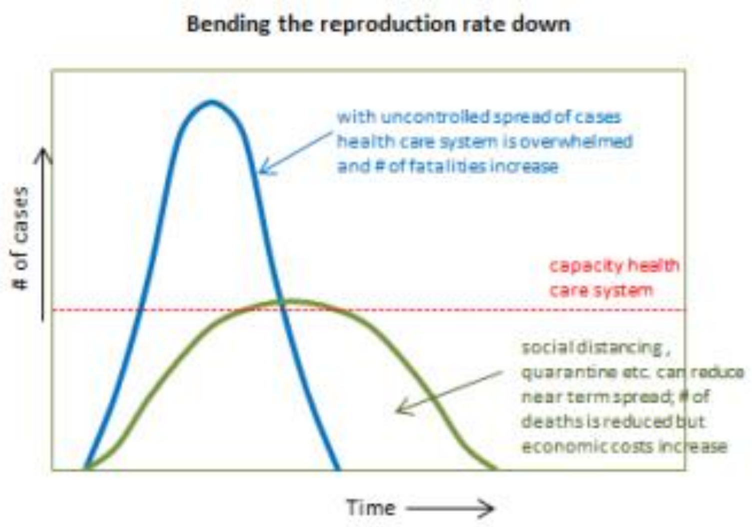


Source: CEIC, WHO, UBS

The UBS publication contains two other useful charts. The first (a version of a well-known chart that has circulated extensively) shows how certain practices can slow down the transmission of the disease (i.e., lower the R_0) so that the HIT is lowered. *If the HIT is low enough, the health system capacity may not be exceeded*.

[13] UBS research note, Kapteyn et al, March 13 2020: *Global Economics & Strategy Pandemic Scenarios for Global Markets – How Bad Could It Get?*

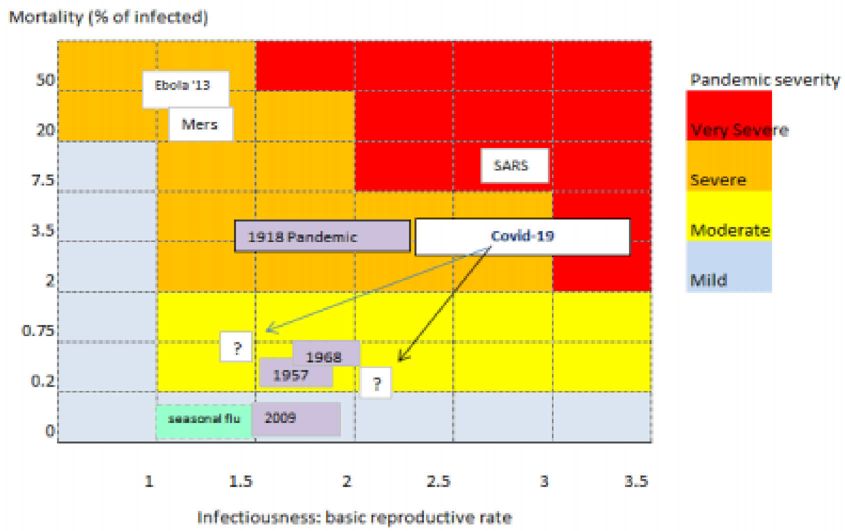
Figure 5: Bending the 'R0' curve down



Source: UBS

The second chart from UBS maps known pandemics from history in a grid of reproduction rate against mortality rate to get some perspective on how COVID-19 compares.

Figure 7: High reproductive rates don't always turn into pandemics



Source: UBS [note: this chart was inspired by the 2011 paper "The Global Economic Effects of Pandemic Influenza" (2011) by Verikios et.al.]

While the position of COVID-19 on this grid (using current data) shows that it is worse than the seasonal flu but better than the 1918 epidemic or SARS, we should stress that every other epidemic is viewed through the lens of history and multiple detailed studies. We have much less certainty on today's crisis.

Realindex performance data as at 29 February 2019:

	1 month	3 months	6 months	1 Year	3 Years	5 Years	10 Years	Since Inception p.a.
Australian Shares								
Realindex Australian Share - Class A (Gross return)	-8.06%	-6.55%	-2.32%	6.63%	7.19%	6.15%	8.20%	10.54%
ASX 200 Accum	-7.69%	-5.18%	-0.63%	8.64%	8.59%	6.17%	7.98%	9.88%
Outperformance	-0.37%	-1.37%	-1.69%	-2.01%	-1.40%	-0.02%	0.21%	0.66%
Australian Small Companies								
Realindex Australian Small Companies - Class A (Gross return)	-8.60%	-5.57%	-2.77%	3.99%	7.18%	10.69%	9.19%	12.06%
ASX Small Ords Accum	-8.68%	-5.87%	-2.40%	1.64%	8.31%	7.43%	4.38%	7.26%
Outperformance	0.08%	0.30%	-0.37%	2.35%	-1.13%	3.26%	4.81%	4.80%
Global Shares								
Realindex Global Share Fund (Screened) – Class A (Gross return)	-5.44%	-4.68%	3.45%	6.77%	10.16%			9.06%
MSCI AC World ex AU Net	-4.49%	-1.19%	5.81%	14.75%	13.54%			10.86%
Outperformance	-0.95%	-3.49%	-2.36%	-7.97%	-3.38%			-1.80%
Realindex Global Share - Class A (Gross return)	-5.42%	-4.63%	3.50%	6.85%	10.17%	8.01%	10.40%	9.90%
MSCI AC World ex AU Net	-4.49%	-1.19%	5.81%	14.75%	13.54%	9.81%	11.82%	10.58%
Outperformance	-0.93%	-3.44%	-2.31%	-7.89%	-3.37%	-1.80%	-1.42%	-0.68%
Global Shares Hedged								
Realindex Global Share Hedged - Class A (Gross return)	-8.70%	-9.32%	-1.54%	-2.78%	3.86%	4.67%	9.29%	11.73%
MSCI AC WI Net ex AU AUD H	-7.92%	-6.20%	0.50%	4.68%	7.10%	6.65%	10.60%	12.26%
Outperformance	-0.78%	-3.12%	-2.04%	-7.47%	-3.25%	-1.98%	-1.31%	-0.53%
Emerging Markets								
Realindex Emerging Markets - Class A (Gross return)	-2.82%	-1.78%	3.09%	-0.55%	8.16%	6.53%		5.12%
MSCI EM Net	-1.64%	1.81%	7.56%	8.27%	11.23%	6.79%		5.82%
Outperformance	-1.18%	-3.59%	-4.47%	-8.82%	-3.07%	-0.26%		-0.70%

Past performance is not an indication of future performance.

For further information contact: clientservices@realindex.com.au		
Andrew Francis Chief Executive Andrew.Francis@realindex.com.au +61 2 9303 7079	**Iain McLear** Investment Manager imclear@realindex.com.au +61 2 9303 6329	**Bonnie Chow** Investment Analyst bonnie.chow@realindex.com.au +61 2 9303 1734

This material has been prepared and issued by First Sentier Investors Realindex Pty Ltd (ABN 24 133 312 017, AFSL 335381) (Realindex). Realindex forms part of First Sentier Investors, a global asset management business. First Sentier Investors is ultimately owned by Mitsubishi UFJ Financial Group, Inc (MUFG), a global financial group.

This material is directed at persons who are professional, sophisticated or 'wholesale clients' (as defined under the Corporations Act 2001 (Cth) (Corporations Act)) and has not been prepared for and is not intended for persons who are 'retail clients' (as defined under the Corporations Act). This material contains general information only. It is not intended to provide you with financial product advice and does not take into account your objectives, financial situation or needs. Before making an investment decision you should consider, with a financial advisor, whether this information is appropriate in light of your investment needs, objectives and financial situation. Any opinions expressed in this material are the opinions of the Realindex only and are subject to change without notice. Such opinions are not a recommendation to hold, purchase or sell a particular financial product and may not include all of the information needed to make an investment decision in relation to such a financial product.

The product disclosure statement (PDS) or Information Memorandum (IM) (as applicable) for those registered managed investment schemes mentioned herein that are managed by Realindex (Funds), which are issued by Colonial First State Investments Limited (ABN 98 002 348 352, AFSL 232468) (CFSIL), should be considered before deciding whether to acquire or hold units in the Funds. The PDS or IM are available from First Sentier Investors.

CFSIL is a subsidiary of the Commonwealth Bank of Australia (Bank). First Sentier Investors was acquired by MUFG on 2 August 2019 and is now financially and legally independent from the Bank. Realindex, MUFG, the Bank and their respective affiliates do not guarantee the performance of the Fund(s) or the repayment of capital by the Fund(s). Investments in the Fund(s) are not deposits or other liabilities of MUFG, the Bank nor their respective affiliates and investment-type products are subject to investment risk including loss of income and capital invested.

To the extent permitted by law, no liability is accepted by MUFG, Realindex, the Bank nor their affiliates for any loss or damage as a result of any reliance on this material. This material contains, or is based upon, information that Realindex believes to be accurate and reliable, however neither Realindex, MUFG, the Bank nor their respective affiliates offer any warranty that it contains no factual errors. No part of this material may be reproduced or transmitted in any form or by any means without the prior written consent of Realindex.

In Australia, 'Colonial', 'CFS' and 'Colonial First State' are trade marks of Colonial Holding Company Limited and 'Colonial First State Investments' is a trade mark of the Commonwealth Bank of Australia and all of these trade marks are used by First Sentier Investors under licence.

Total returns shown for the Fund(s) are gross returns and do not take into account any ongoing fees. No allowance has been made for taxation. Past performance is no indication of future performance.