



The possible economic consequences of a novel coronavirus (COVID-19) pandemic

The expanding economic consequences of the coronavirus

At the start of 2020, the world watched on as the Chinese city of Wuhan (11 million residents), and then the province of Hubei (60 million residents), went into lock down.

The hope was that the newly emergent coronavirus – later renamed formally as the novel coronavirus (COVID-19) – would be contained.

Despite unprecedented steps to stop the spread of the virus, we began to see disruption to the Chinese economy, and subsequent contagion to other economies as:

- the movement of people became restricted
- supply chains became disrupted.

In Australia the impacts were first felt by:

- domestic businesses (e.g. student and not-student tourism) which rely on the movement of people from China to Australia)
- just-in time discretionary expenditure businesses exporting into China (e.g. lobsters).¹

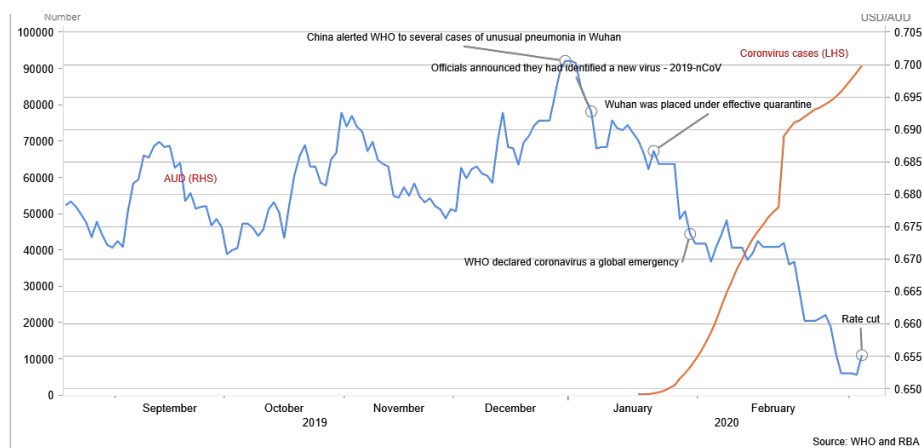
As inventories began to run low, manufacturing international supply chains increasingly became affected.

In parallel we saw movements in:

- **Commodity prices:** Prices rose as some hypothesised that the Chinese Government would seek to stimulate the economy with a new wave of infrastructure spending, and then fall with the slowdown of the broader Chinese economy
- **The Australian Dollar:** The Australian Dollar (AUD) is a proxy for the Chinese Yuan (RMB). As the number of confirmed coronavirus cases increased and China's economy slowed, the Australian Dollar depreciated against the United States Dollar to levels not seen since the global financial crisis (GFC) (see figure overleaf).

1. Powell (2019), 'Virus outbreak in China triggers Tasmanian lobster lockdown', *Sydney Morning Herald*, 25 January, available at www.examiner.com.au/story/6598002/coronavirus-fears-trigger-tasmanian-lobster-lockout/

Australian Dollar and confirmed coronavirus cases



Projecting forward, the key concerns related to:

- Whether the substantive outbreak would be contained to China. The coronavirus' spread to Italy, Iran, Japan and South Korea suggest that containment has not been successful. Nations across the globe are now planning on the virus breaking out
- The longevity of the virus is a real constraint and remains an uncertainty
- The pace at which industry can return to normal once the virus is contained. While initial hopes were that industry would bounce back quickly, as occurred following the 2003 SARS outbreak, the Chinese economy's increased size and sophistication, and the increased inter-connectivity of supply chains makes this less likely.



Modelling approach

We have undertaken economic modelling to estimate the potential impact of coronavirus on the global economy. The approach adopted is conceptually similar to that employed by the Commonwealth Treasury in its modelling of the SARS outbreak of 2002-03.¹

Specifically, we have used a model of the global economy – the Global Trade Analysis (GTAP) model – which is a multi-region global, multisector, computable general equilibrium (CGE) model.²

Application of this model allows us to test how we believe industries and households will respond when subjected to a ‘shock’ to the normal order of activities – such as the coronavirus.

Application of this model

We need to be cognisant, however, of the limitations of this approach (which are evident in other methods as well). For example, our simulations are not unconditional predictions but rather are better considered as ‘thought experiments’ about what the world may be like.

Our modelling is predicated on a number of assumptions about the coronavirus’ spread and how it will affect the population and industry. These assumptions could be refined over time as more complete evidence emerges.

Specifically, we have assumed impacts over the next 12 months addressing:

- **Labour input:** We have assumed a general reduction in labour input associated with the virus as the sick are unable to work. We have assumed that 50% of the global population contract the disease,³ and that 61% of those are in the workforce and they are absent from work for 5% of the year (about two and a half weeks off). This approximates about a 1.525% reduction in the global labour supply
- There is a permanent **reduction in the workforce** of a smaller number due to coronavirus-triggered deaths. We have conservatively assumed that deaths amongst working age people are lower than the estimated 1% overall.⁴ Assuming a 0.5% death rate, this is a further 0.1525% reduction in labour supply.

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1. Commonwealth Treasury of Australia (2003), ‘The economic impact of Severe Acute Respiratory Syndrome (SARS)’, *Economic Roundup*, Winter, pp.43-60
 2. Corong, Hertel, McDougall, Tsigas and Van der Mensbrugghe (2107), ‘The Standard GTAP Model, Version 7’ 2(1) *Journal of Global Economic Analysis*, Volume 1-119.
 3. This is a global average. We note that virologists in Australia have warned that we should expect that all Australians will contract the virus - Chambers and Robinson (2020), ‘Everyone will get coronavirus, virologist warns as Scott Morrison activates pandemic plan’ *The Australian*, 28 February, p.1.
 4. Associated Press (2019), ‘2% Death Rate from Coronavirus, World Health Organization Says’, *Journal of Emergency Medical Services*, 29 January, available at www.jems.com/2020/01/29/2-death-rate-from-coronavirus-world-health-organization-says/



- **Capital productivity:** We have assumed a reduction in economy-wide productivity of capital of -0.57% (a third of the reduction in labour) representing idle capacity in the economy due to the breakdown in global supply chains
- **Government spending:** There is an increase in government spending on health and public order of 1% of total government spending
- **Technological shocks:** There are increased costs of international trade. Industries specifically affected are those:
 - where supply chains are integrated across borders (electronics) — a 1% increase in costs
 - that move goods and people (trade, air transport), tourism, education and recreation — a 5% increase in costs
- **Private consumption** is reduced leading to a 0.5% increase in savings. This reflects that over time consumers are likely to be more cautious about going out and spending money.

Estimated impacts of the coronavirus pandemic

Our modelling generates negative economic outcomes in all countries/regions on the basis that the coronavirus lowers both output and productivity over a year.

The scale of the impact can be measured in terms of declines **in gross domestic product (GDP)**.

GDP is a measure of a country's net output. While often criticised as a measure of welfare, GDP remains the standard benchmark by which we measure a nation's economic health.¹

We estimate that over a year, a coronavirus pandemic could reduce:

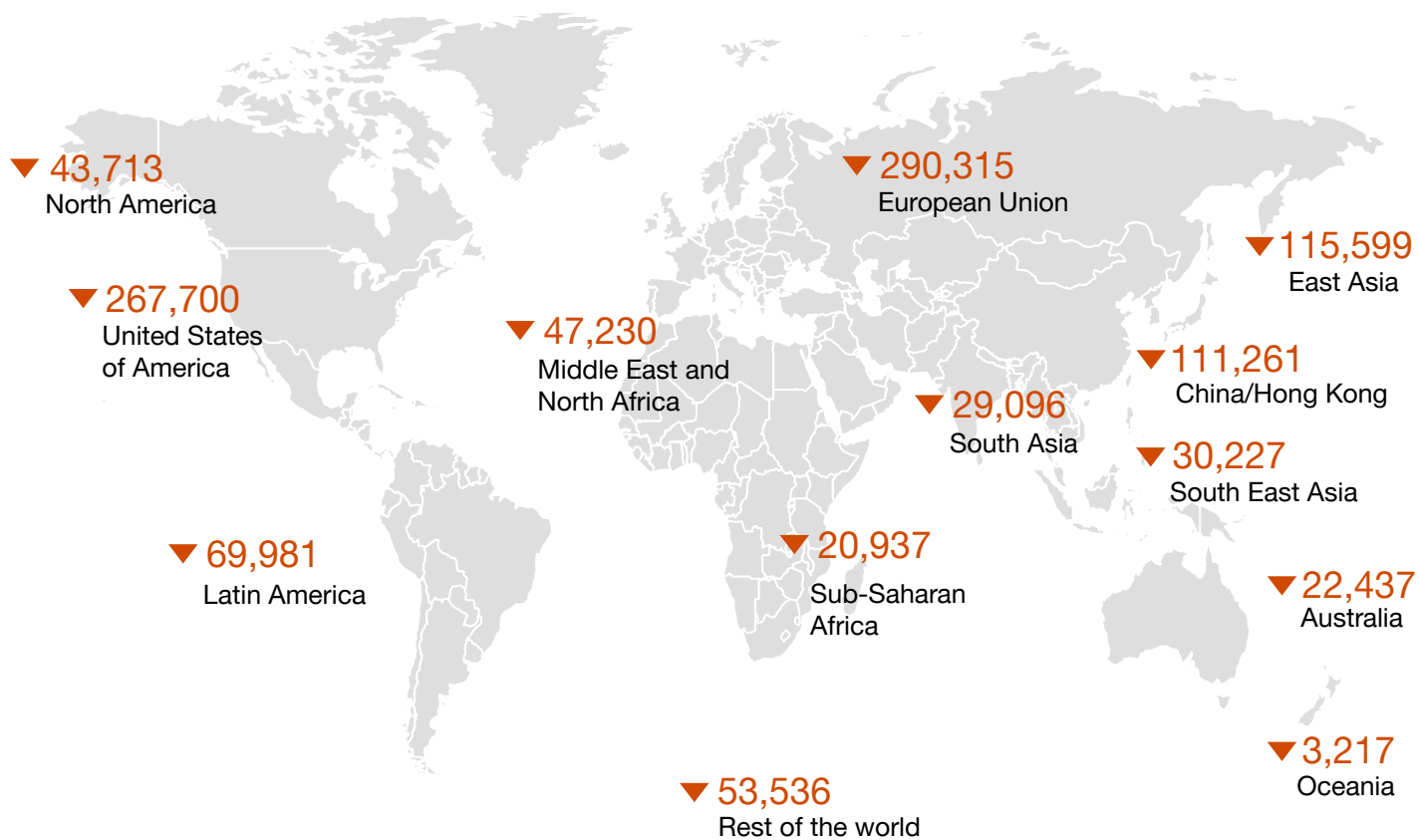
 **\$34.2 billion**
Australia's GDP by

To put this economic contraction in context, we note that:

- we have estimated a pandemic-related contraction in Australia's GDP of 1.32%
- at the peak of the GFC global GDP declined by 5.2%.

1. Oulton (2012), *Hooray for GDP! GDP as a measure of wellbeing*, COX - CEPR Policy Portal, available at voxeu.org/defence-gdp-measure-wellbeing

Loss of GDP US\$m



The scale of the impact can also be measured in terms of declines in **consumption**.

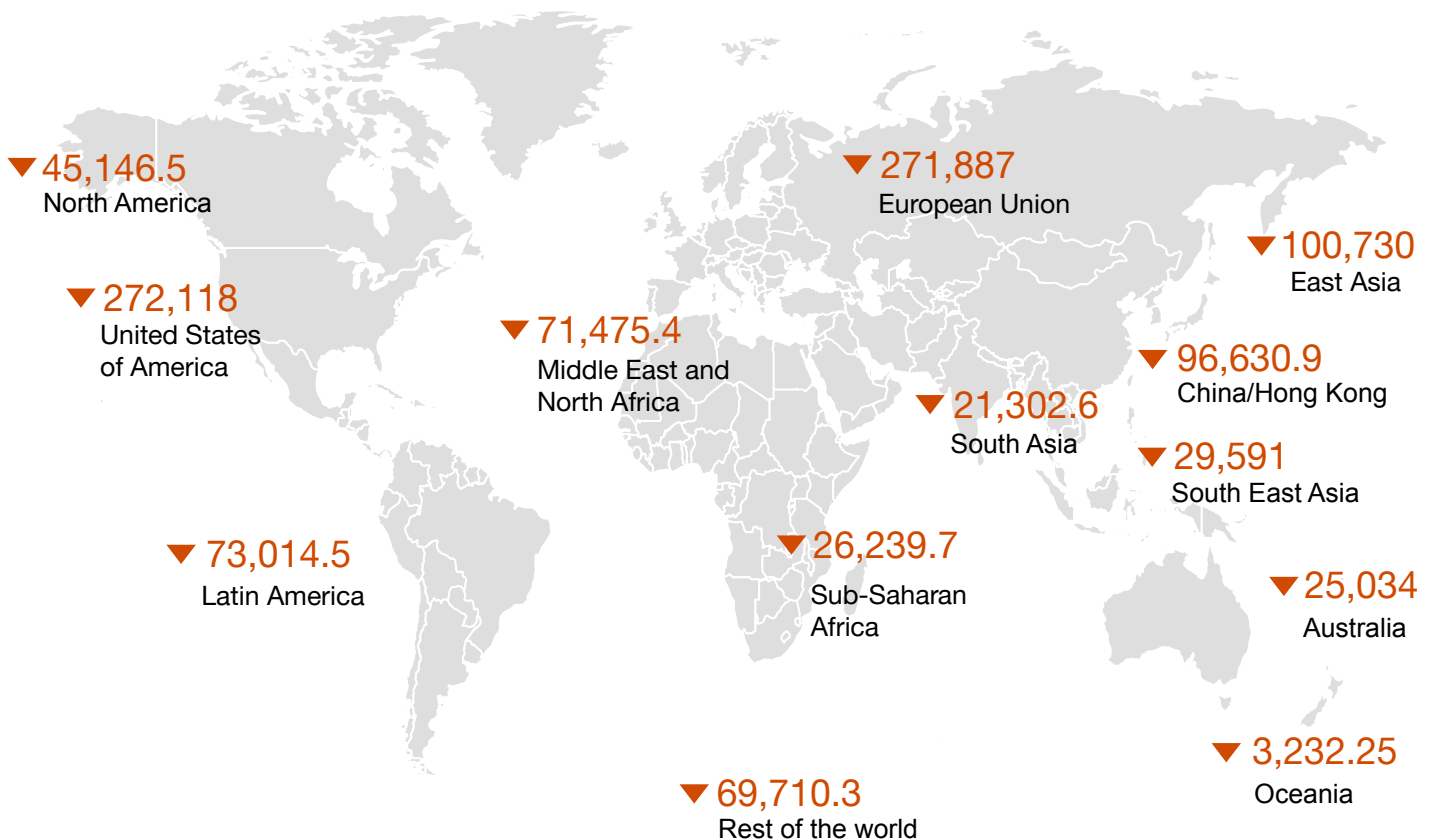
Household consumption is generally seen as a better measure of welfare than GDP because it more directly measures how much better off householders are.

We observe that countries (like Australia):

- with relatively higher service sectors and high consumption suffer relatively more under the coronavirus pandemic scenario
- that rely on imports for consumption goods, and exports that are inputs into producing those goods, can suffer through not being able to get the imports (or only at higher prices), and not being able to produce them domestically and facing a loss in demand/ lower prices for their exports.

Hence, we project that Australia's household consumption will decline by **A\$37.9 billion** over the forecast year.

Loss of consumption US\$m



Government impacts

The impact on the Commonwealth Government's Budget position would be substantial.

We project that the 2020-21 tax revenue would fall by A\$25.8 billion (using the December 2019 MYEFO projections).

Assuming an additional 1% increase in expenditure, which may be conservative, the Budget's underlying cash balance would fall from a projected A\$6.1 billion surplus to a deficit of A\$24.8 billion; a A\$30.1 billion swing.

For comparison, at the time of the GFC the cash balance was a deficit of A\$27 billion (2008-09) and A\$54.5 billion (2009-10).

The community impact

While our analysis focuses on the narrow economic cost of a potential coronavirus pandemic, the broader social cost of such a loss of life should not be overlooked.

The coronavirus is disrupting people's lives, even before its impact is directly felt on a community; fear; stockpiling of food and medical products, and so on.



27% of the world's population were thought to be affected by the Spanish flu pandemic of 1918

As a point of comparison, the Spanish flu pandemic of 1918 is thought to have infected 500 million people globally, or about 27% of the world's population.¹

The death toll from the Spanish flu is estimated to have been in the vicinity of 40 to 50 million, although some estimates are as high as 100 million.² In effect, the death toll from Spanish flu was somewhere in the vicinity of 2.2% to 5.4% of the 1918 world population.

1. Taubenberger and Moreno, '1918 Influenza: the mother of all pandemics' 12(1) *Emerging Infectious Diseases* 15-22
2. World Health Organization (2005), 'Ten things you need to know about pandemic influenza (update of 14 October 2005)' 80(49-50) *Releve Epidemiologique* 428-431; Jilani, Jamie and Siddiqui (2020), 'H1N1 Influenza (Swine Flu)', *StatPearls [Internet]*, available at ncbi.nlm.nih.gov/books/NBK513241/

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pwc.com.au/coronavirus-impact

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