



# Impact of the Covid-19 crisis on the TIC sector

OC&C Perspectives on Short-Term Impact and Potential Opportunities

14 April 2020



**OC&C**  
Strategy consultants

uncommon sense

# Introductions

We welcome Q&A  
Please submit questions at [www.slido.com](http://www.slido.com)  
– use the event code #13948

**Bennet Summers**  
Partner



**Henry Charrington**  
Associate Partner

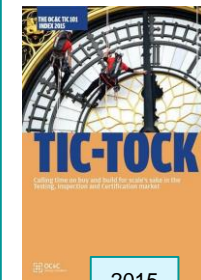


## OC&C and TIC

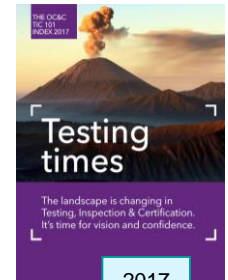
- OC&C is a global strategy consulting firm, bringing clear thinking to the most complex issues facing management
- Founded in 1987, with 12 office worldwide
- Client roster includes some of the largest corporations and most innovative challengers in the world, and their investors
- Over the last decade we have worked extensively in TIC
  - Over 50 projects with participants of all sizes and end-markets and regions
  - Over 1000 interview customer programmes in relevant end markets

## TIC IP, Publications & Thought-Leadership

### 'TIC101' Proprietary Database and Published IP



2015



2017

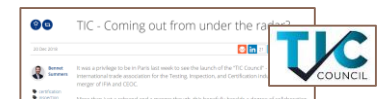
### 2017 ACIL Conference Speech



### 2019 Barclays Conference Speech



### Regular sector commentary



# Agenda for today

40 mins presentation + 20 mins Q&A  
(Please submit questions at [www.slido.com](http://www.slido.com)  
– use the event code #13948)

## A crisis like no other

COVID-19 has created a human and economic crisis at a global level that is already creating long-term disruption – no industry is immune

## Impact on TIC markets

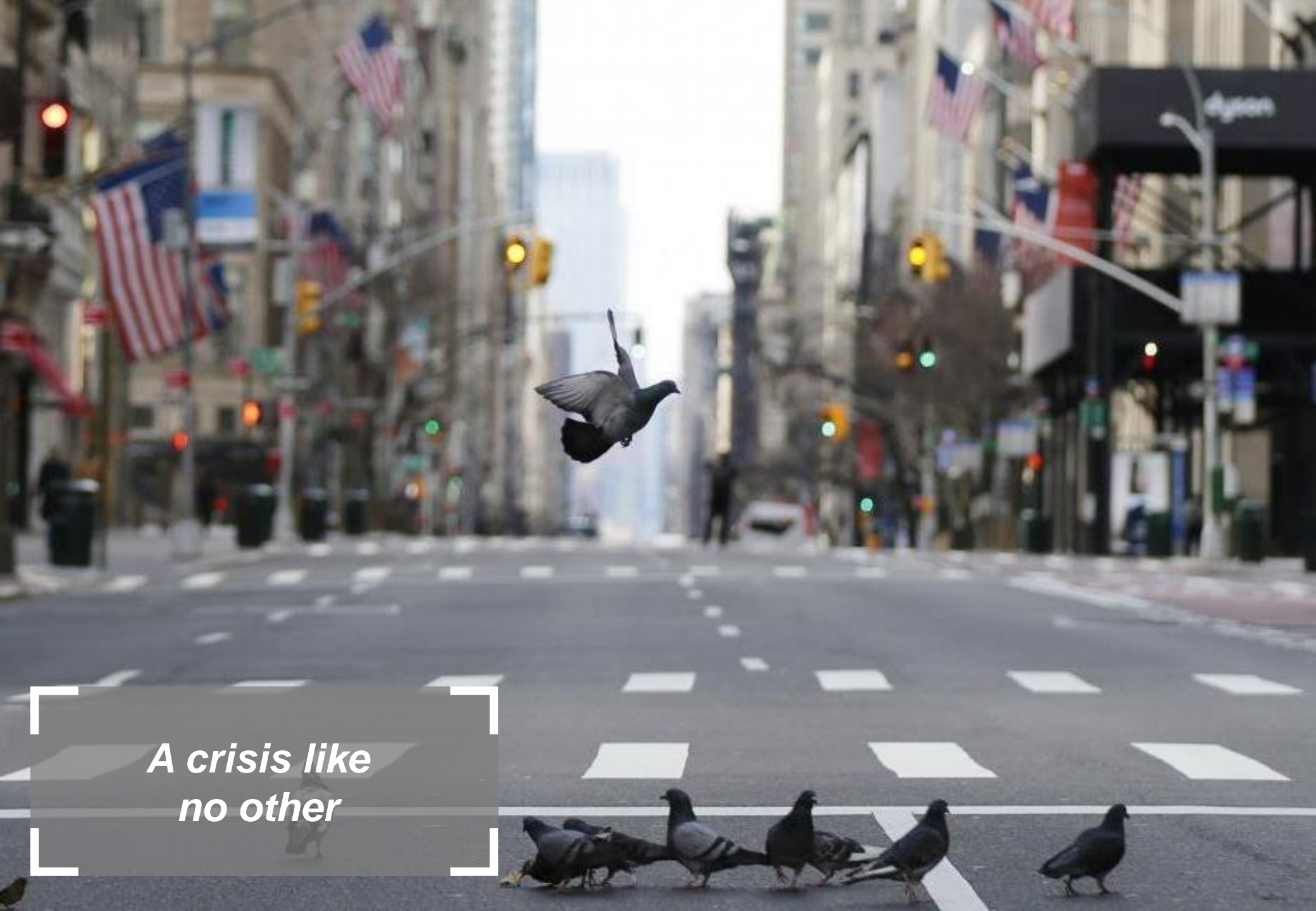
The depth and duration of impact on TIC markets will vary hugely, driven by the end-sectors served, stage in the value chain, and nature of the service delivered

## Impact on TIC providers

Major TIC players are experiencing significant pressure after years of growth, showcasing the resilience of a few

## Opportunities for TIC providers

Although the immediate focus is on operational challenges, there are short term opportunities to assist with the Covid-19 response. Tomorrow, there will be opportunities to bounce back stronger and, for the bold, long-term structural shifts in the industry to capitalize on



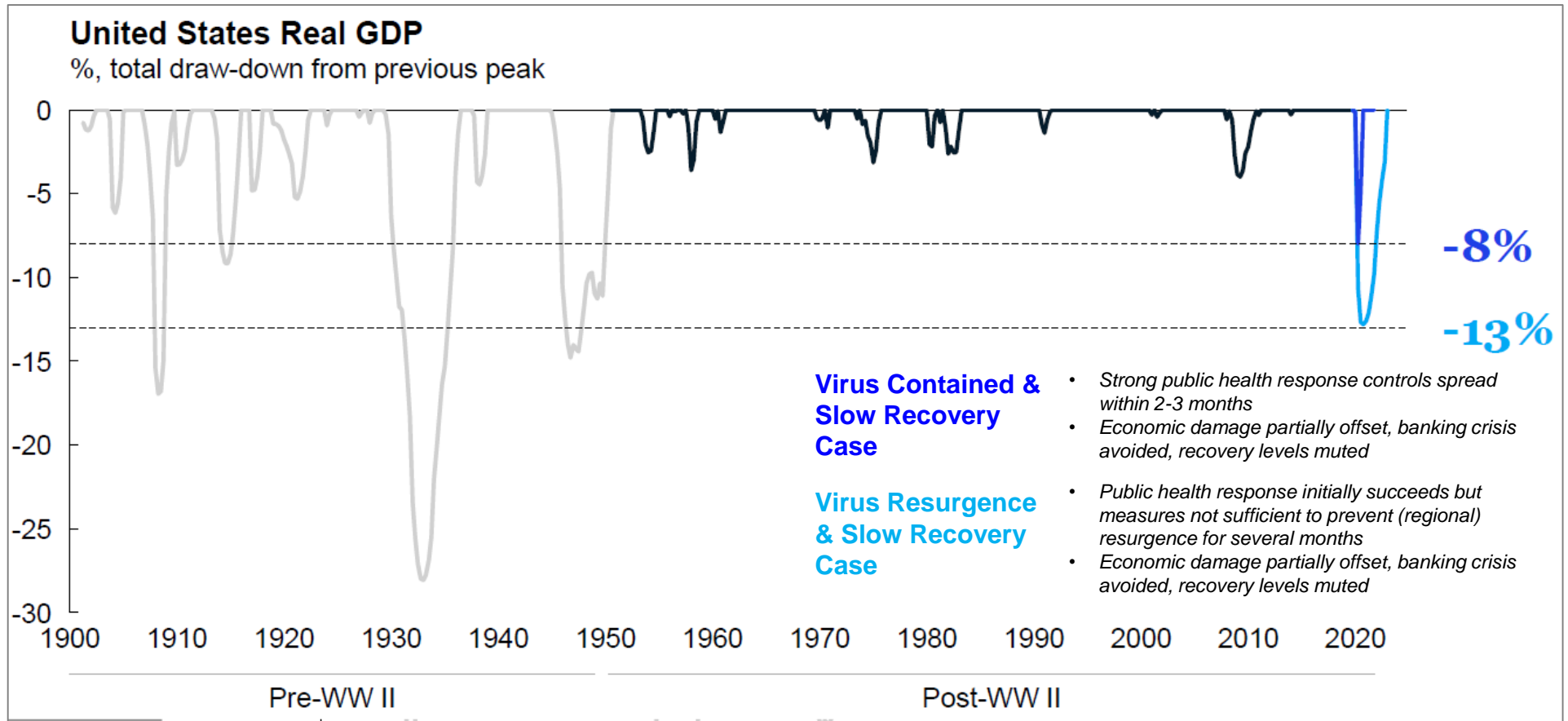
*A crisis like  
no other*

A crisis like no other

# The Covid-19 crisis is unprecedented – the scale of impact on the economic growth of Western geographies will likely be the deepest since World War II

Scale of US GDP Growth Impact

US Only  
Data as of April 2020

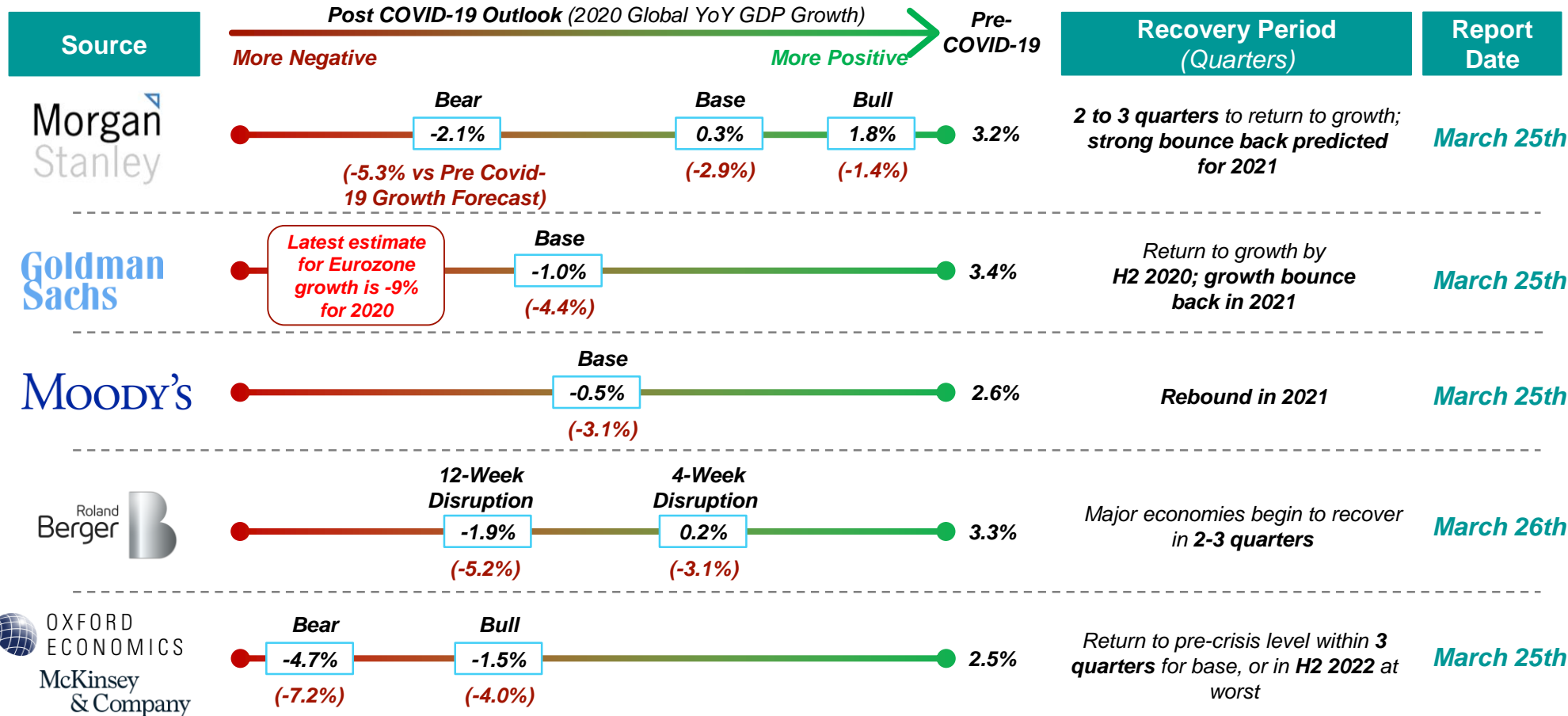


A crisis like no other

# We are currently in ‘peak uncertainty’ – recent forecasts on global GDP growth impact of Covid-19 range from -2% to -7%...

Global Economic Forecasts

## Selected 3rd Party Forecasts



Other sources were reviewed (IMF, Deutsche Bank, Morningstar) – however these reports were last updated 10+ days ago so are not considered representative



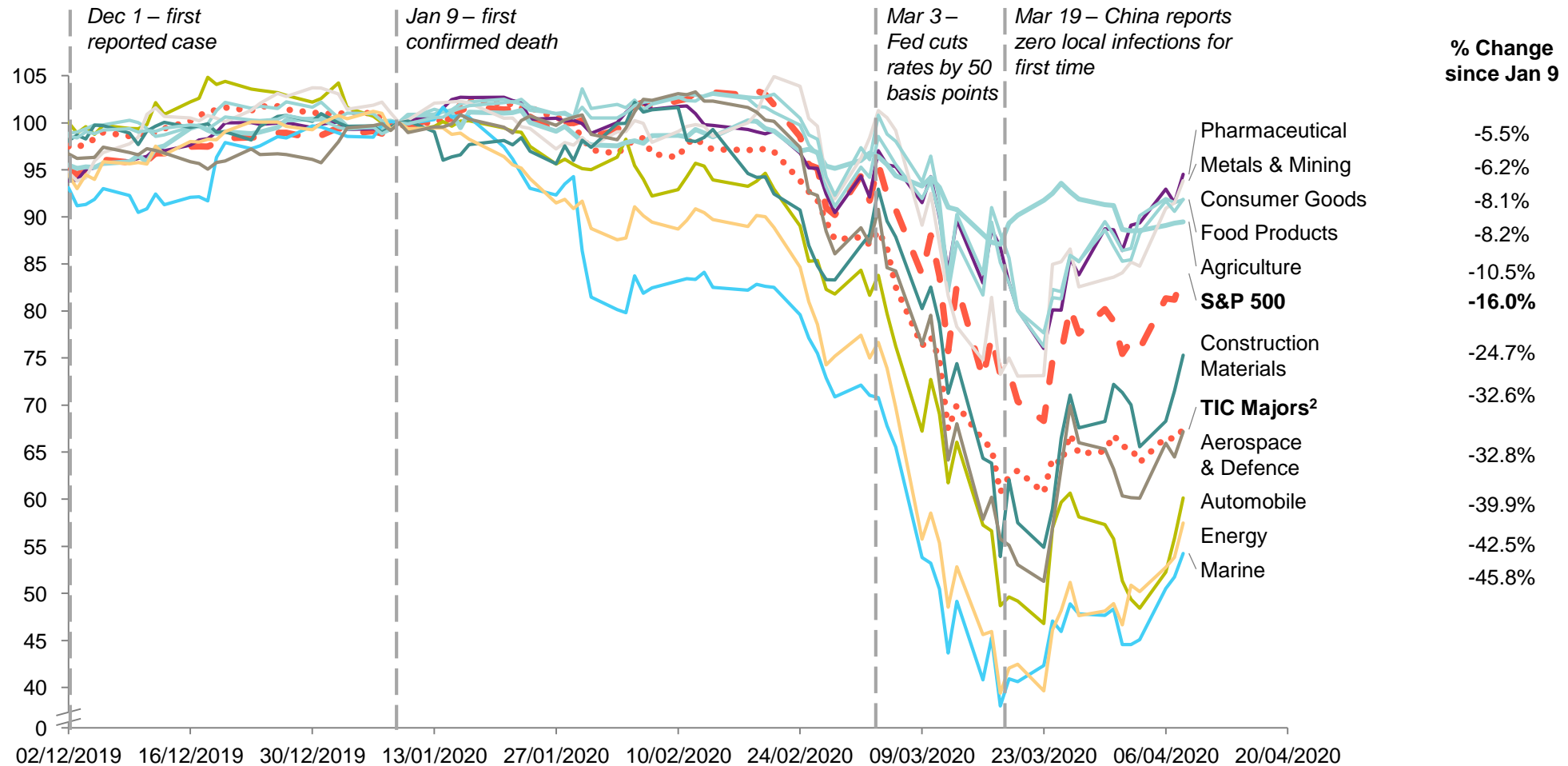


A crisis like no other

# ... which has translated to significant hits to valuations in public markets (TIC has underperformed the S&P 500 and many of its end sectors)

TIC End Markets' Share Price Performance<sup>1</sup> Against Market & TIC Majors,  
2<sup>nd</sup> Dec 2019 – 9<sup>th</sup> April 2020

As at 9 April 2020



1. Indexed to 100 = Jan 9<sup>th</sup> 2020; based on S&P 500 and Dow Jones indices for industries  
2. Players included: Eurofins, SGS, Intertek, Bureau Veritas, Team Inc, Applus+, Mistra, ALS  
Source: Financial Times, Yahoo! Finance, Desk Research, OC&C analysis



A crisis like no other

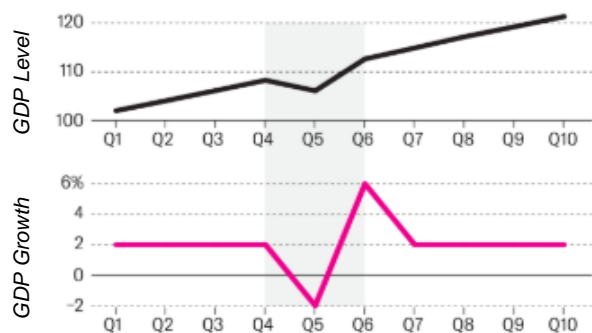
# The shape of the global economic recovery could follow a number of paths – historic precedents for pandemics have followed the ‘V’ shape...

Likely Economic Recovery Scenarios following COVID-19

Illustrative

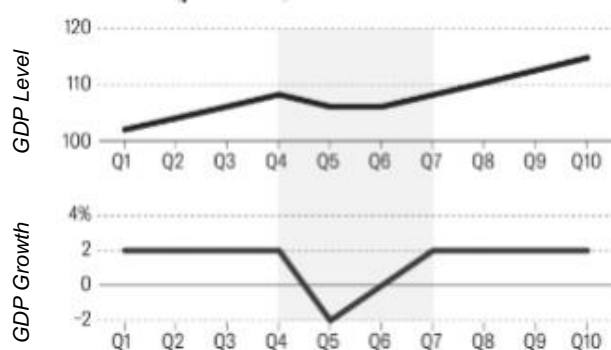
## GDP Growth Recovery Scenarios following Epidemics

### 1. ‘V’ Scenario



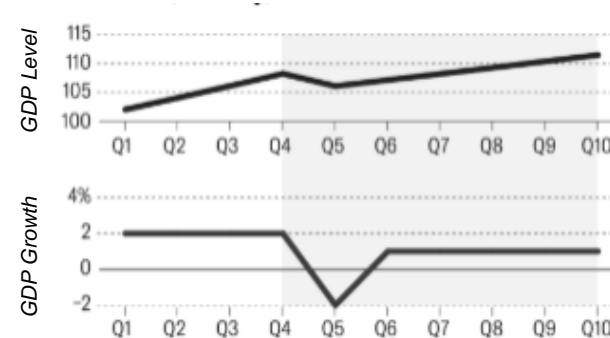
- Describes the “classic” real economy shock - a displacement of output, but growth eventually rebounds and annual growth rates fully absorb the shock
- Recovery to prior output levels is quick, within 6 months
- Shape of recovery seen in the SARS 2003 outbreak, 1968 Asian Flu, 1958 Hong Kong Flu, and 1918 Spanish Flu

### 2. ‘U’ Scenario



- The economic shock persists, and while the initial growth path is resumed it takes longer to return to the original growth path
- Recovery is hence slower and to somewhat lower output levels (vs pre-shock) within 6-12 months

### 3. ‘L’ Scenario



- The shock causes significant structural damage, i.e. leading to longer term impact on economic productivity
- There is hence a major knock-on impact on output levels longer term such that growth cannot be fully return to former levels



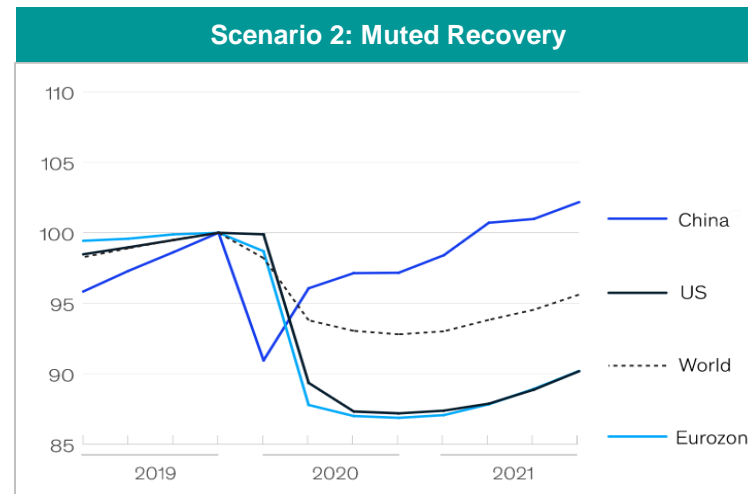
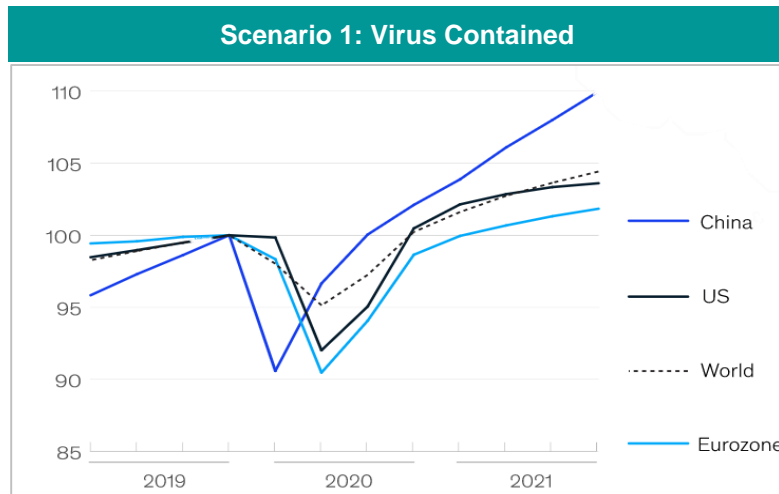


A crisis like no other

# ... however experts suggest global economic recovery from Covid-19 will be more prolonged, with a very different shape of recovery by market

Global GDP Growth Impact Phasing

MGI / Oxford Economics Forecasts



*“Right now we know it's not going to be a 'V'. It's going to be more in the best of cases a 'U' with a long trench in the bottom before it gets to the recovery period.”* (Angel Gurría, OECD Secretary General – March 23rd)

- **The pace of economic recovery in any given country relies on two key factors**
  1. The ability to control the spread of the virus through public health intervention measures.
  2. The success of government’s financial support programmes in stimulating economic activity
- **The ‘V’ shaped scenario seen in previous pandemics now appears optimistic**
  - Most Western economies planning for significant disruption for 3-5 months at least
- **Speed of recovery will also be highly dependent on effective testing strategies (where the TIC industry has a big role to play)**

*“The idea of a V-shaped recovery, returning quickly to growth, can't be taken for granted and could prove optimistic.”* (Paolo Gentiloni, EU Economic Commissioner – March 2<sup>nd</sup>)



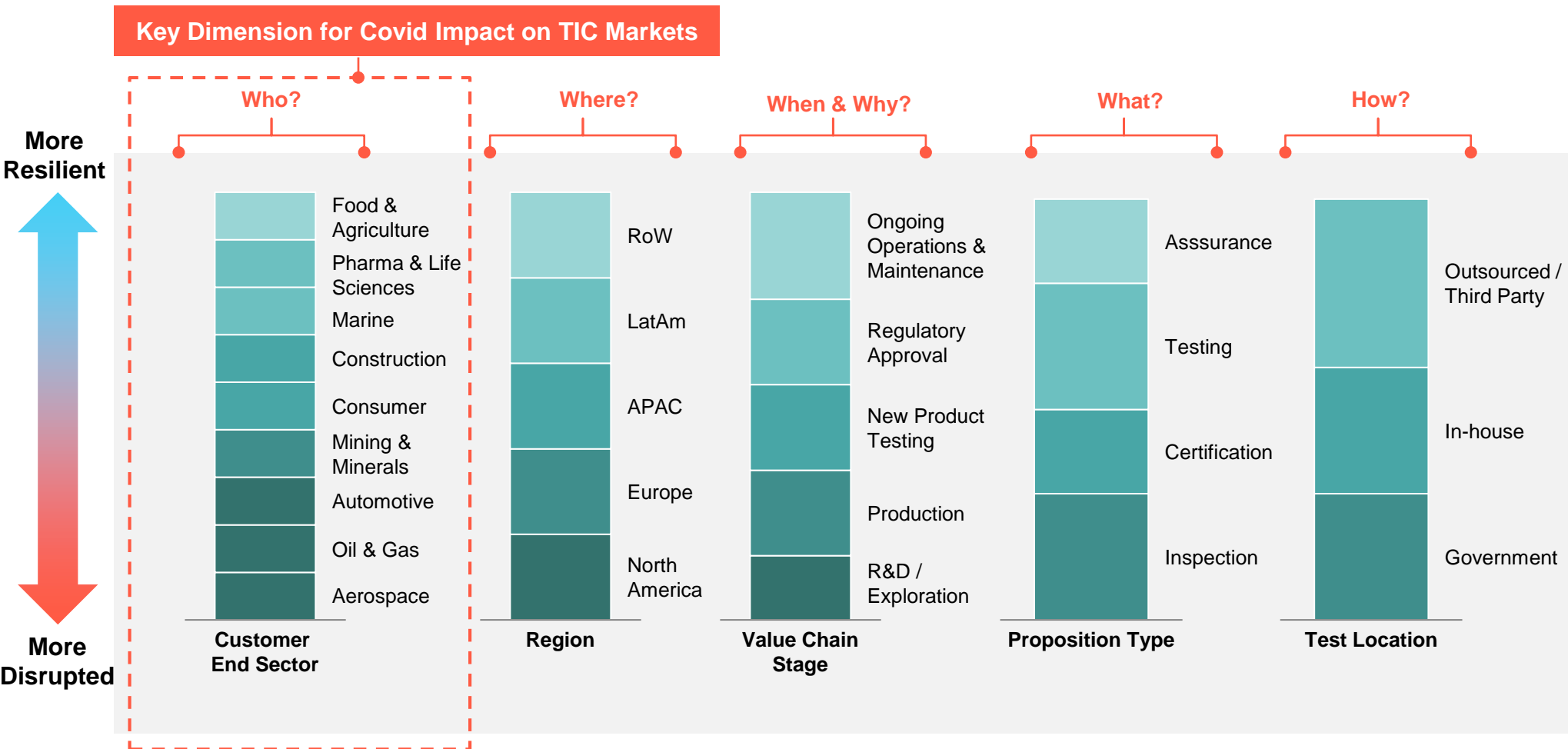


*Impact on TIC  
Markets*

Impact on TIC Markets

# There are multiple supply and demand dimensions that determine the impact and timing of Covid on TIC, with end-sector served the most significant

## Segmenting Covid's Impact on TIC

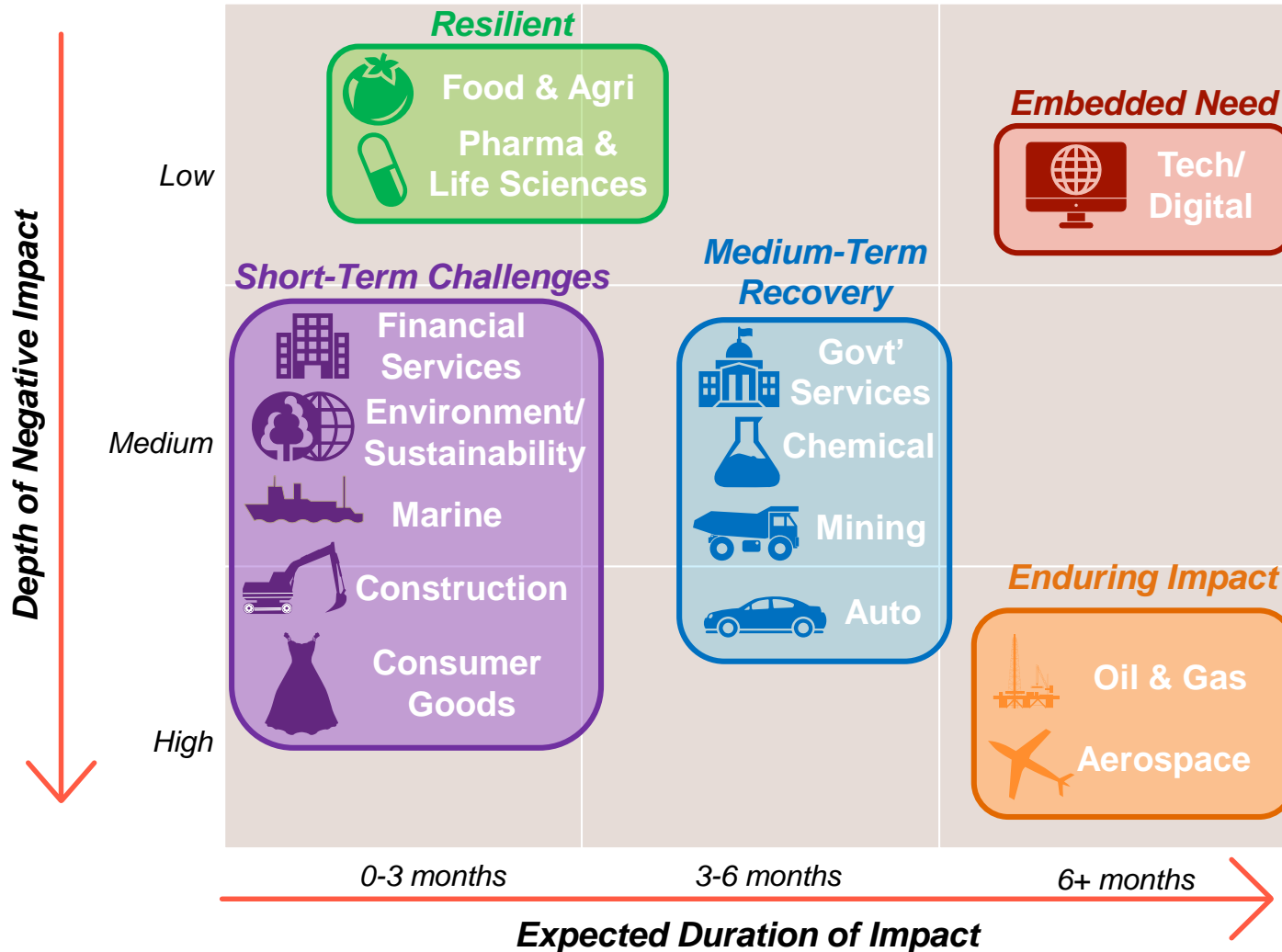




# TIC's core sectors differ significantly by the expected depth and duration of the impact Covid-19 has on end-market demand

Negative Impact on TIC End Market Sub-Sectors

Not Exhaustive












Impact on TIC Markets

# The significant variation across end-markets is the result of some large variations in severity of impact on the key end-market volumetric indicators

## TIC Customer End Sector Assessment

 Short-term increase 
  Limited impact 
  Medium-term decrease 
  Longer-term decrease

		COVID-19 Impact on End Market			Impact on TIC Spend	Commentary
		Severity of End Market Impact (%pts)	Duration of Impact (months)	Shape of Recovery		
Resilient / Critical	Food & Agriculture	+10-20% (Grocery Spend)	0-3	N/A		<ul style="list-style-type: none"> <li>Short-term uptick in production from stockpiling, but long-term minimal impact</li> <li>Channel shift from foodservice to grocery benefits TIC spend by increasing labelling (and therefore nutritional testing) requirements</li> </ul>
	Pharma / Life Sciences	+2-6% (EU Healthcare Spend)	3-6	N/A		<ul style="list-style-type: none"> <li>Increased spending on healthcare as a result of the virus; however mostly on low profit margin products (facemasks etc)</li> <li>Supply constraints limit potential for TIC benefit from rise in demand</li> </ul>
Short-term Challenges	Marine	-20% to -30% (China marine traffic)	0-3	V-Shaped		<ul style="list-style-type: none"> <li>Fast rebounds have been seen after ports and shipyards closures led to drops in activity</li> <li>TIC spend is regulatory-driven and likely to be maintained at existing levels</li> </ul>
	Construction	-15% to -30% (China Real Est Investment)	3-6	V-Shaped		<ul style="list-style-type: none"> <li>Short-term disruption as sites close, but most projects delayed rather than cancelled so TIC spend expected to hold firm</li> </ul>
	Consumer Goods	-10% to -40% (Retail sales)	3-6	V-Shaped		<ul style="list-style-type: none"> <li>Sharp initial decrease due to lockdown conditions leads to short-term production TIC decrease; R&amp;D and innovation still fundamental so TIC spend protected</li> </ul>
Medium-term Recovery	Mining & Minerals	-5% to -10% (China base metal production)	3-6	L-shaped		<ul style="list-style-type: none"> <li>Limited COVID impact as mining activity has been protected/deemed essential</li> <li>Recessionary impact could lead to reduction in exploration capex-driven TIC spending (although less sensitive than O&amp;G)</li> </ul>
	Automotive	-5% to -20% (Auto sales) <sup>3</sup>	6-12	L-shaped		<ul style="list-style-type: none"> <li>Production hit from factory closures &amp; supply chain challenges</li> <li>Both consumers and businesses holding off on purchasing, with economic uncertainty delaying purchase volumes over the medium-term</li> </ul>
Enduring Impact	Oil & Gas	-20% to -40% (O&G Revenue) <sup>3</sup>	6-12	L-Shaped		<ul style="list-style-type: none"> <li>Production likely to see a short-term hit due to labour shortages from virus</li> <li>New projects more at risk, up to 2/3 expected to be cancelled</li> </ul>
	Aerospace	- 30% to -55% (Airline Revenue)	12+	U-Shaped		<ul style="list-style-type: none"> <li>Tighter travel restrictions vs previous epidemics leads to deeper impact, with knock-on impact on MRO spend;</li> <li>Liquidity issues for airlines likely to impact order books and lower oil price could push airlines to continue operating older (less efficient) aircraft, decreasing R&amp;D TIC spend</li> </ul>

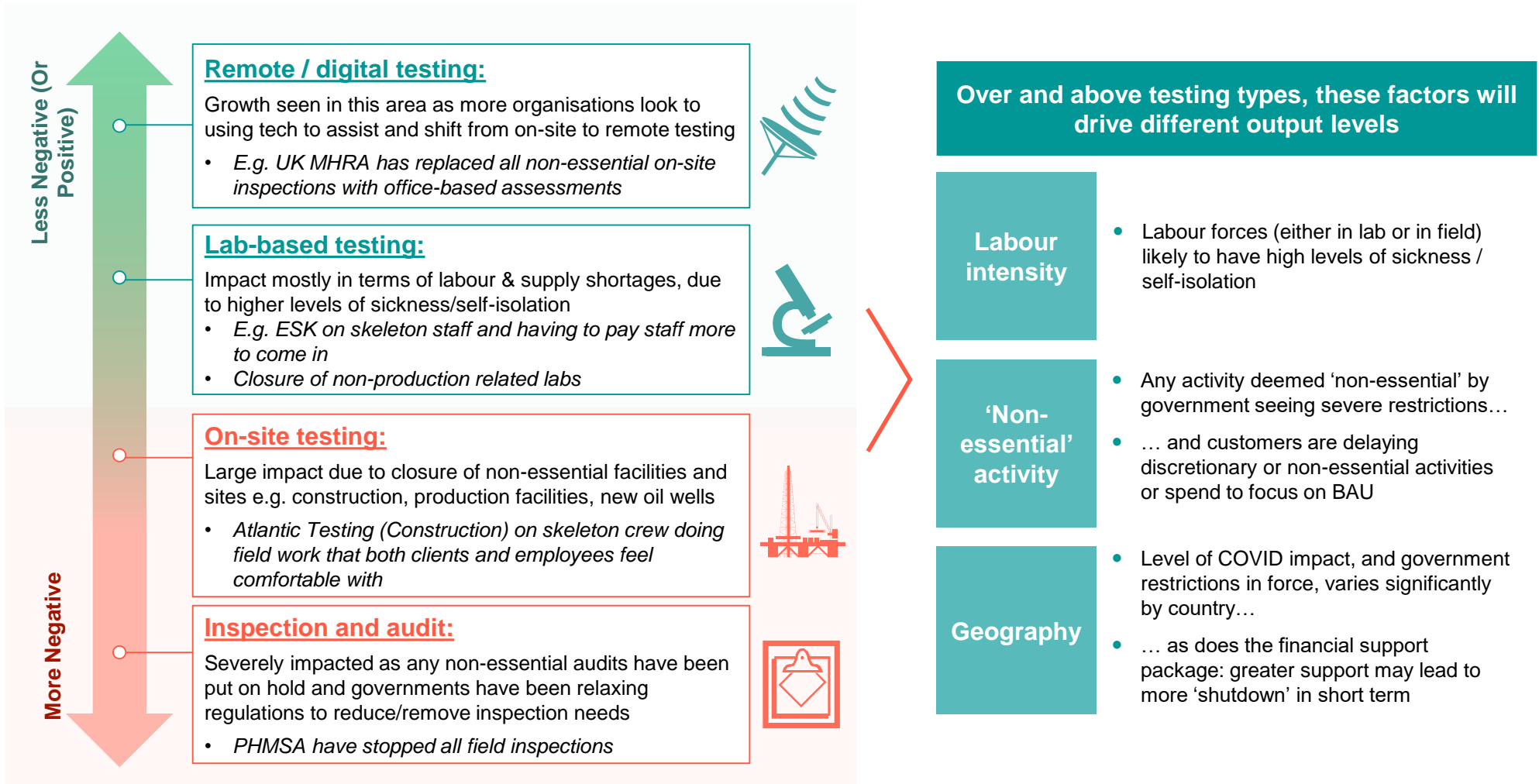




# The type of operation performed is also having a significant impact on TIC output levels – especially for field-based activities

Impact On TIC Service Types

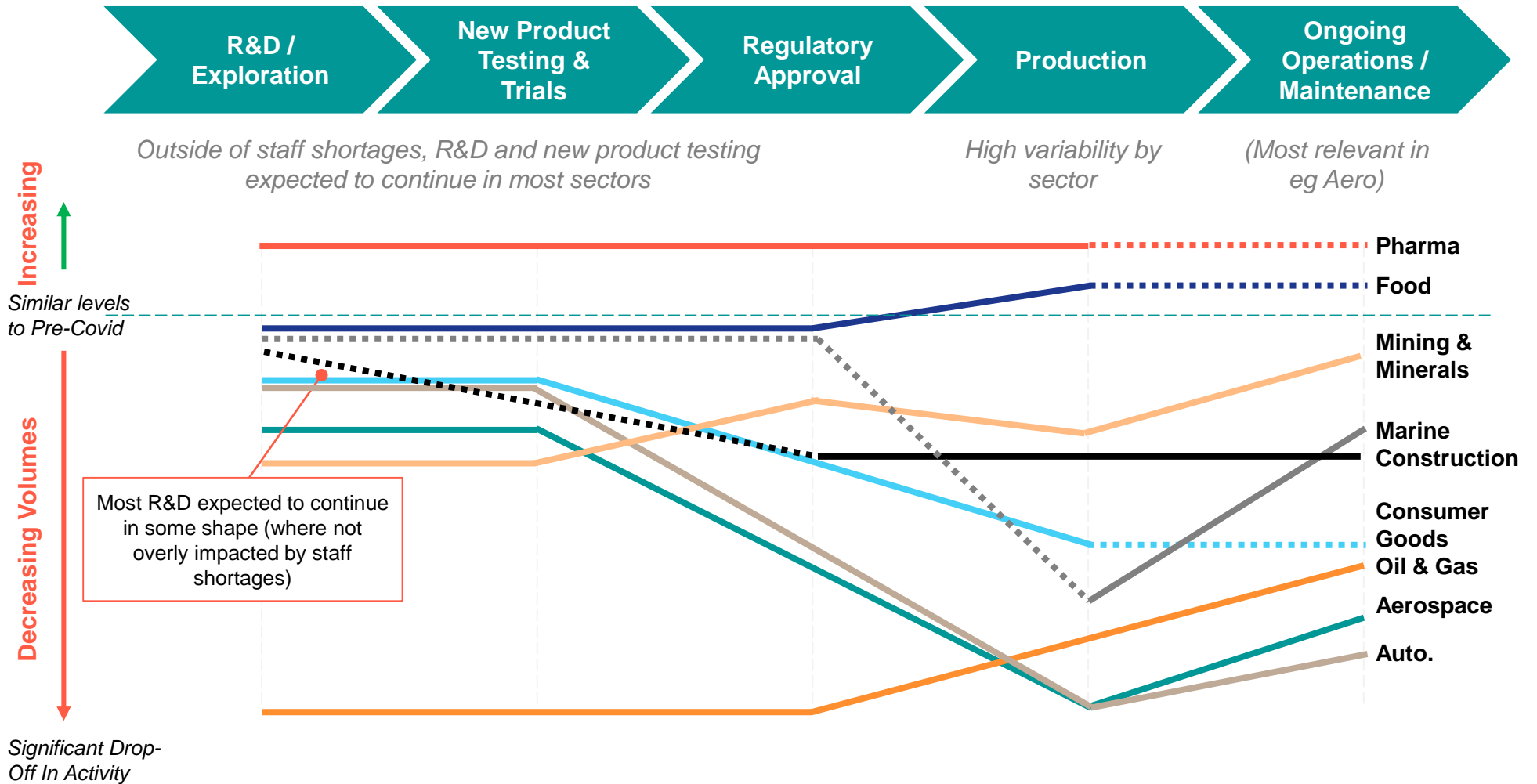
Not Exhaustive





# The volume of ongoing TIC activity will vary by value chain stage; in general, early stage TIC is expected to be relatively less impacted across sectors

Level Of Testing By Stage In Supply Chain



Impact on TIC Markets

# The pace of recovery for TIC in different end-markets will also, in part, be dictated by the rate at which supply chains recover

## Impact of Pandemic on Supply Chains

Covid-19 has had a variety of significant impacts on supply chains



### Regional imbalances

- Global supply chains are currently highly interconnected and thus more vulnerable to regional disruption
- Many TIC end markets are dependent on China for parts; one missing component can stop all factory ops. When ports reopened a surge in port calls outstripped port capacity



### Slowdown in logistics capabilities

- Reduced port activity and closed forwarding ops due to port closures and labour shortages
- Lack of empty containers to allow for exports (e.g. US 15.1% yoy decline in empty container handling in Feb)



### Rapid restructuring of supply chains

- Since China went into lockdown, firms have been acting to try and reduce reliance on China, e.g. shift to Vietnam
- Air freight and air cargo prices have gone up as firms look to expedite supply chain restart as soon as factories reopen
- Likely longer term impacts from stop-gap measures (eg empty containers in the wrong place)



### Downstream impacts

- Roll-on impacts on downstream industries who depend on components from upstream manufacturers e.g. lighting shortages have impeded ability to complete construction



### Medical supply export restrictions

- Some countries have placed restrictions on medical supply exports e.g. in early March, German authorities stopped delivery of 240,000 masks to a Swiss buyer
- Places additional constraints on pharma testing e.g. fewer lab workers can work due to insufficient medical equipment

Consequently, pace of recovery is likely to be slower than expected in some sectors

Industries hardest hit will be those with:

- **Global supply chains** (ie. dependent on global quarantine conditions)
- **Manufacturing hard-to-source goods** (ie. supply chains cannot be easily changed)
- **Requiring specialised workforces as a critical input** (requiring significant time to train new staff where parts of the workforce may still be in quarantine)
- **Not deemed critical by governments** (ie. governmental intervention & support is less likely)







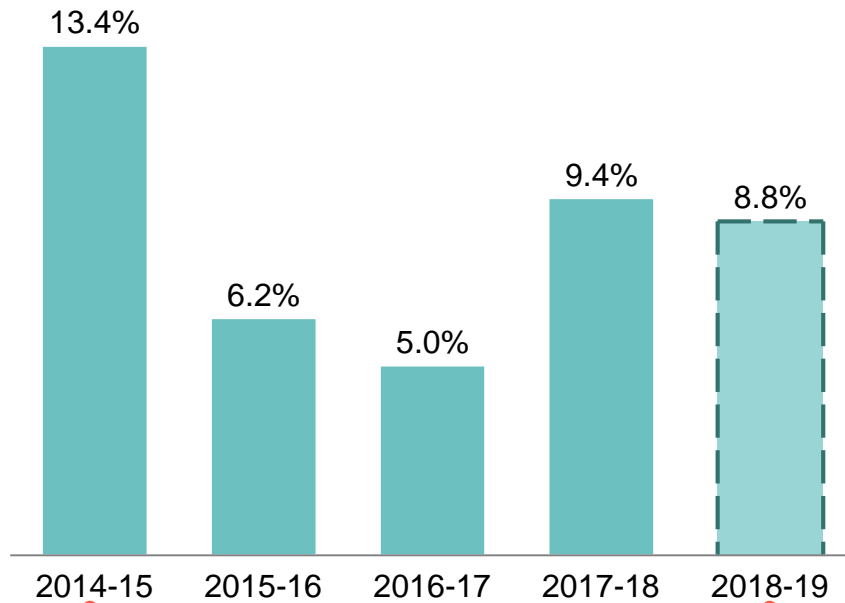
*Impact on TIC  
Players*

Impact On TIC Players

# Prior to coronavirus impact, TIC had performed well with underlying growth of +9% in the TIC 101 since 2017 and consistent growth across sectors

## Overview of Historic TIC Revenue Growth

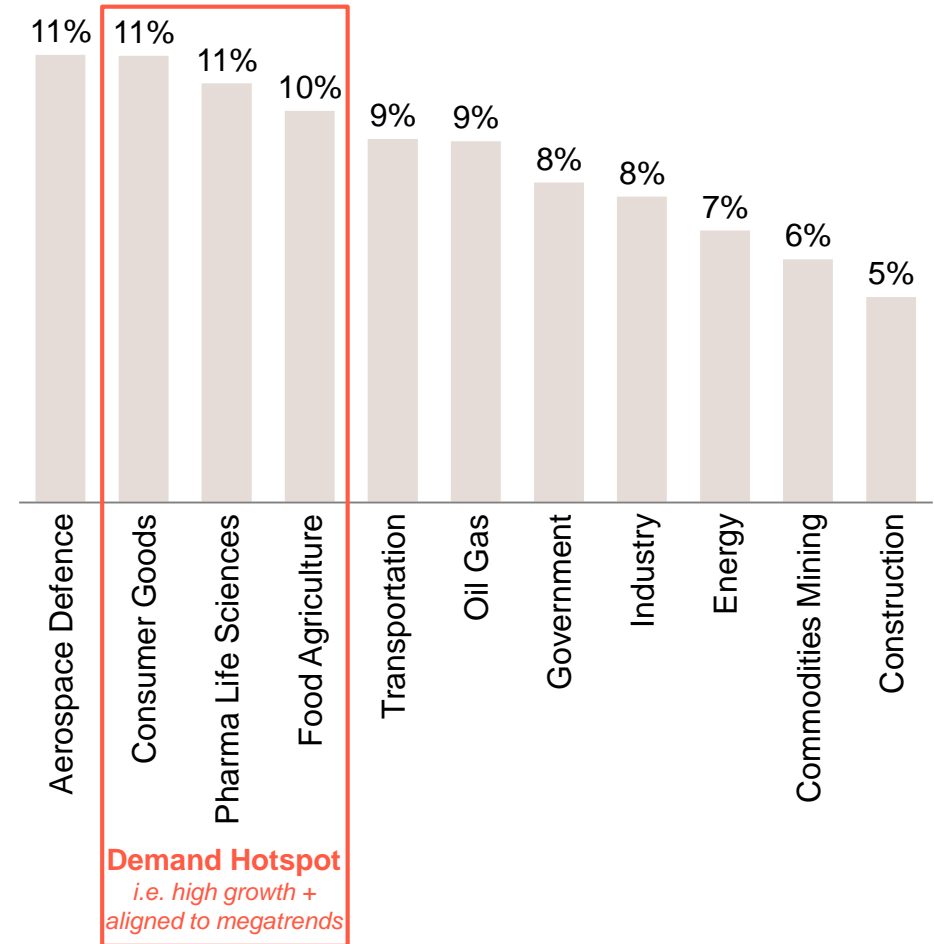
TIC 101 Growth, 2014-19 (% YoY)



Driven by strong acquisitive growth (13%) in largest 6<sup>1</sup> providers – eg, Eurofins growth from €1.4bn to €2.0bn

Partial data – based on 21 companies that have published results (the same peer set grew +10% in 2017-18)

Revenue Growth by Sector Exposure, 2017-18 (% Average Growth<sup>2</sup>)



1. SGS, Bureau Veritas, Intertek, DEKRA, Eurofins and TUV SUD  
2. % average growth of providers exposed to each sector and also not exposed to >7 sectors  
Source: Capital IQ, Company Websites, OC&C IP, OC&C analysis

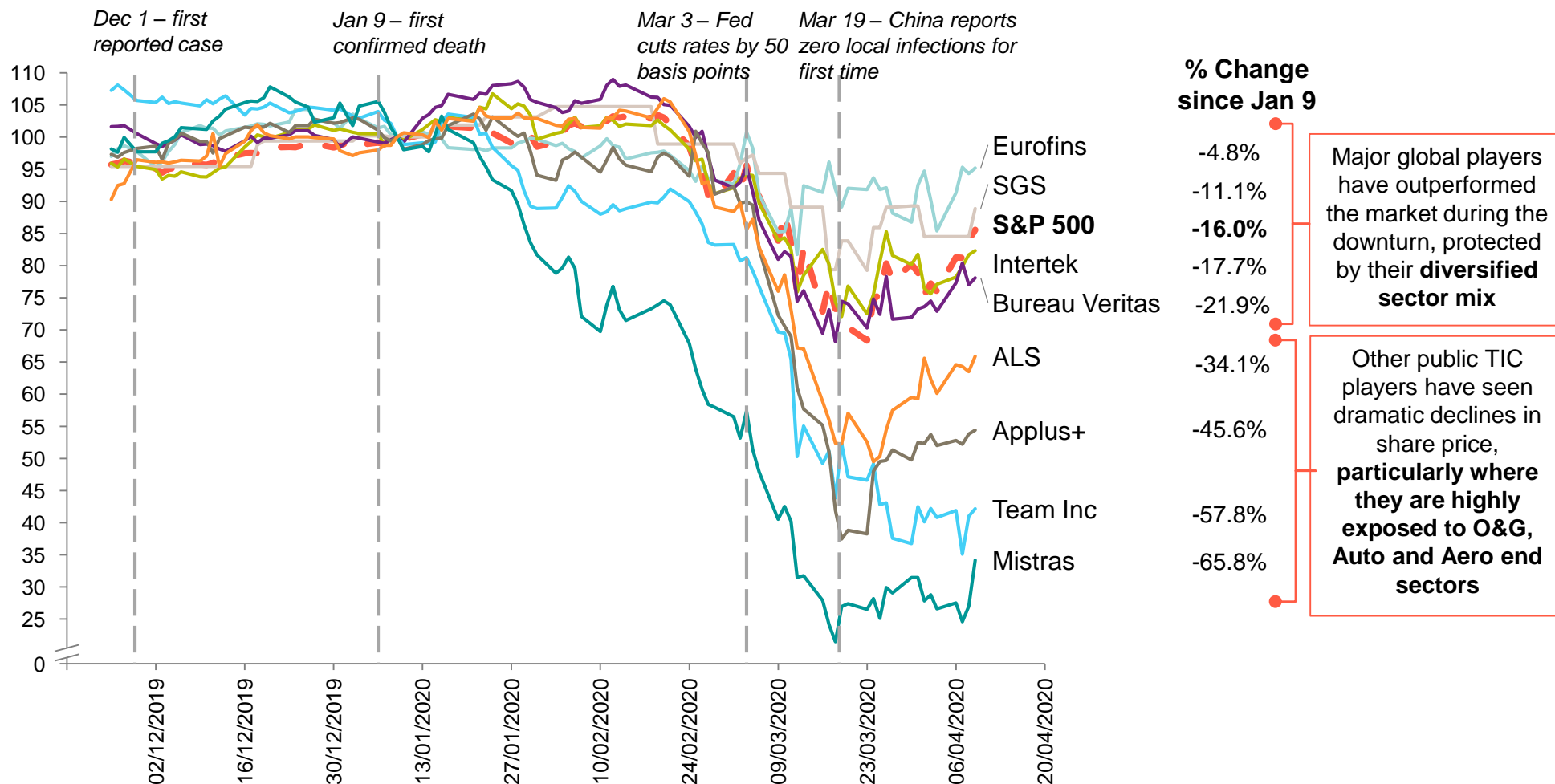


Impact On TIC Players

# The variations in fortune are clearly seen across listed TIC provider share price – those with major Energy or Transportation exposure are down 45-65%

TIC Players' Share Price Performance<sup>1</sup> Against Market, 25<sup>th</sup> Nov 2019 – 9<sup>th</sup> April 2020

Top 8 Listed TIC Companies as of 9 April 2020



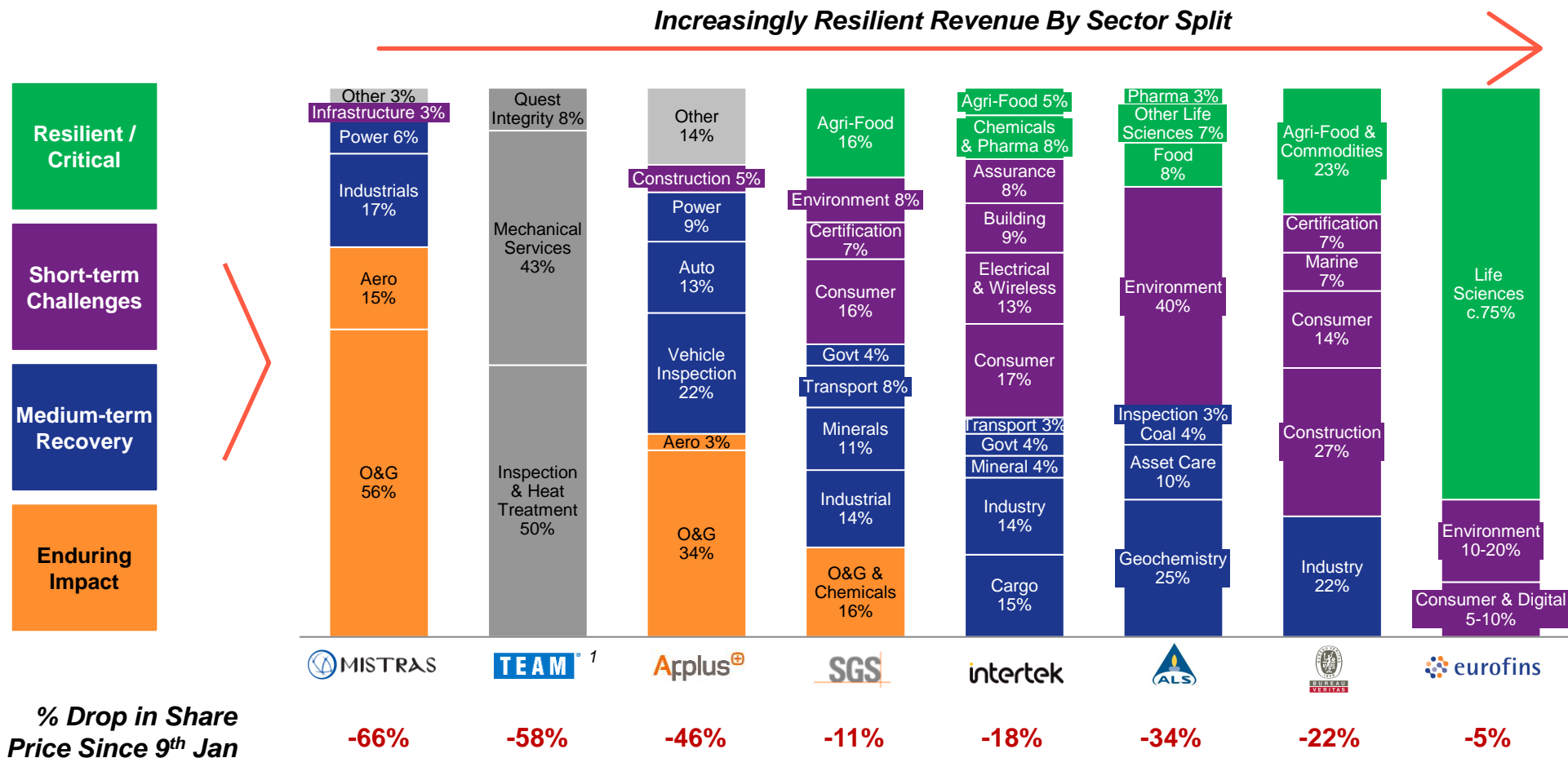
1. Indexed to Jan 9 2020  
Source: Yahoo! Finance, OC&C analysis



Impact On TIC Players

# The importance of end-sector exposure to valuation can clearly be seen in the correlation between share price and revenue mix (for all but ALS Global)

Revenue by Sector of Key TIC Players, 2019



1. A more granular split out is not available for TEAM Inc, however given the industry focus (Aero, Refining, Petrochemical & Chemical, Pipeline, Power, Manufacturing, Mining, Pulp & Paper), it is assumed that the majority of revenue comes from customers in sectors that will face an Enduring Impact or Medium-term Recovery  
 Source: Desk Research, Annual reports, Broker Reports, OC&C analysis



Impact On TIC Players

# Major players are expecting to see 5%+ hits to revenue and 2%pts+ margin – although cost management and government schemes mitigate the worst

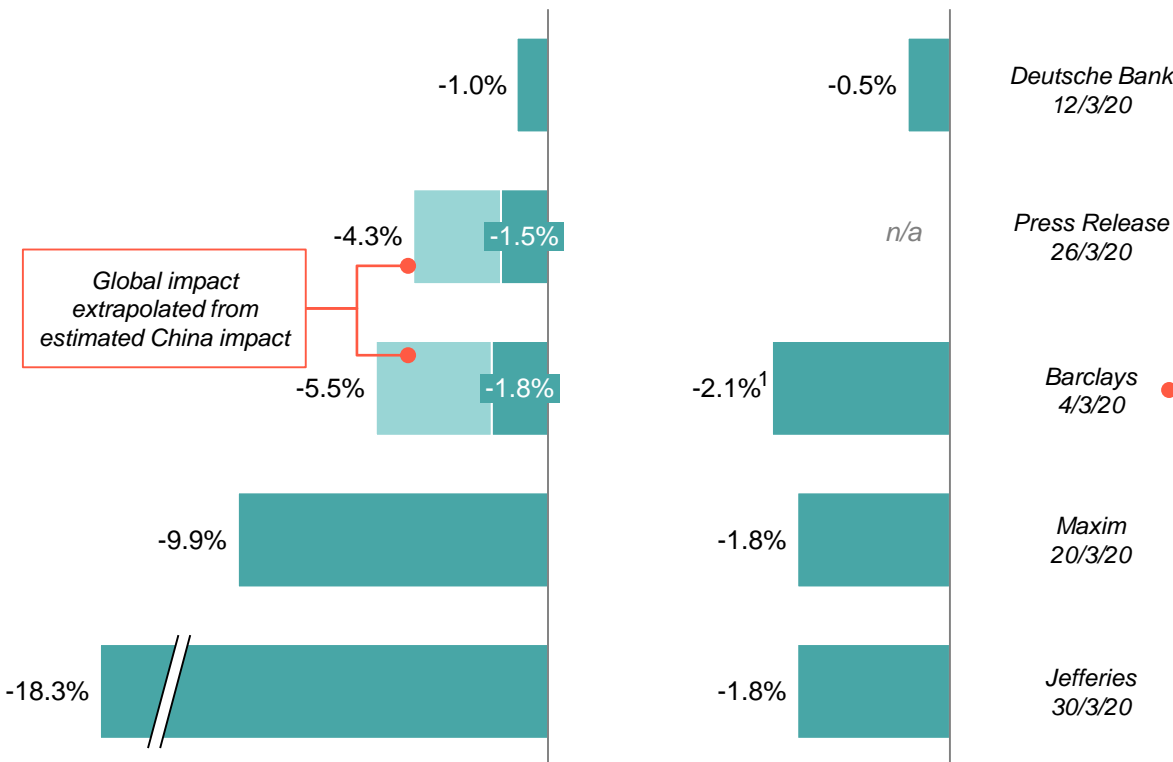
Estimated Revenue and EBITDA Margin Impact to TIC Players Due to COVID-19

Selected players only

Latest view on change next year in...

Revenue (% YoY)

EBITDA (%pt delta)



Published views on the Covid-19 revenue impact often limited to China where we see a revenue impact of between 5-10% in that region over 2020

Assumes demand returning to 100% over 10 weeks, and majority of work will be deferred to 2021 rather than lost

To mitigate impact on margin and cash, most players undertaking cost-cutting measures including furloughing staff, decreased leadership salaries, and capex deferral

1. EBITA shown for Intertek; Estimated impact assuming Europe and North America operations are affected similarly to China  
Source: Brokers reports, Annual reports, OC&C analysis





*Opportunities for TIC  
Providers*



# Although the immediate focus for many providers is resilience, opportunities exist across the industry today, tomorrow, and the day after tomorrow

Call to action: Opportunities for TIC providers



**+ Kindness**

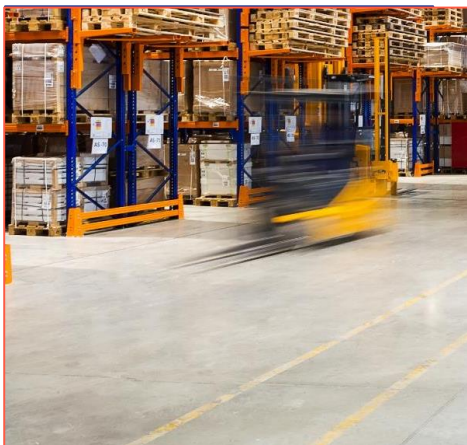
- Now and in the 'new norm', businesses will be remembered for how they engaged
  - Now is a time to prioritise purpose over profit
  - Support valued partners and customers
  - Repurpose assets for the broader good



# In the short-term, TIC players are contending with operational challenges while supporting their customers in the global response

TIC Player immediate responses

## Resilience *(with upside)*



### 1. Operational resilience today

- Acting with pace, agility, and kindness in uncertain times is key
- Many Testing services viewed as 'essential' but still operating with much reduced staff in constrained working conditions
- Focus on cost base and cash in order to weather the storm



### 2. Support the global fightback

- TIC's vital role in responding to the crisis is clear, testing for covid itself and critical medical equipment
- Third parties have a key (and in some cases unprecedented) role in supporting the fightback



### 3. Support existing & new customers

- Customers across sectors asking for flexible and rapid responses to new accreditations to bring on new suppliers and products
- Staying close to customers' rapidly evolving situation is key



1 Resilience – Operational Resilience

# A series of operational challenging are hitting TIC providers as they face into the initial storm

## Operational Resilience

Operational Challenges & Actions		Immediate Priorities
<b>Staffing</b>	<ul style="list-style-type: none"> <li>Many labs are already operating with <b>skeleton crews</b>;</li> <li><b>Significant uncertainty on the duration of lockdown orders</b> and when staff will be able to get back to work</li> <li>Some labs are responding by <b>reducing staff hours</b>, but maintaining pay where possible</li> </ul> <p><i>“Everyone who can is working from home – the labs are very empty.”</i> US Testing Company</p>	<p><b>Focus on cost base and cash to preserve operations in the short-term while keeping staff informed of the situation</b></p>
<b>Supply Chain Disruption</b>	<ul style="list-style-type: none"> <li>As resources are diverted to the Covid response, <b>supply chains are coming under pressure</b></li> <li><b>Shortages of crucial materials</b> (eg reagents, PPE) are hindering normal testing activities</li> <li>Some providers are <b>exploring partnership opportunities</b> to see them through</li> </ul> <p><i>“Our concern is more about capacity to test than testing demand.”</i> US Testing Company</p>	<p><b>Increase flexibility (eg shifts) to deal with demand / supply volatility</b></p>
<b>Customer Comms</b>	<ul style="list-style-type: none"> <li>Customers appear still to <b>regard many testing services as essential</b></li> <li>Reaching out <b>proactively to inform customers</b> of reduced capacity / longer turnaround times</li> </ul> <p><i>“We’re finding different ways to contact customers, but they don’t always have a process.”</i> US Testing Company</p>	<p><b>Keep in regular contact with customers, understanding their shifting needs</b></p>



2 Resilience – Supporting the Fightback

# There is an immediate opportunity for the TIC industry to assist the world in weathering this crisis by collaborating closely with public authorities

## Potential TIC Opportunities in Covid Response

### Ramp up Testing Capacity



- There are two main Covid tests:
  - **RT-PCR Test** for diagnosis
  - **Antibody Test** to determine whether a patient has had Covid
- In most countries, **public health authorities don't have the capacity** to deliver testing on a mass scale
- Opportunity is for TIC players to **repurpose capacity in their labs** to speed the response

### Accreditation of New Tests and Materials



- **New tests and medical equipment are being developed** to address the impact of Covid
- Public Health Authorities require accreditation, but **traditional processes are too slow** to meet demand
- Opportunity for TIC providers is to **work with public health authorities to achieve fast, safe accreditation**, with ongoing cross-checks

## Success Story: Lessons from South Korea & Germany Covid-19 Responses



- South Korea and Germany have led the world in test capacity, at **c.20k and c.70k tests per day** by the end of March (vs 6k-8k in UK). This has been achieved through:
  - **Close collaboration between 3<sup>rd</sup> party labs and public authorities**
    - c.118 labs in South Korea carrying out PCR tests vs c.30-40 in UK
  - Rapid accreditation of Covid-19 tests, with **“Emergency Use Authorisation” to approve tests (with ongoing cross-checks) after 7 days**

*“It was clear that if the epidemic swept over here from China, then **we had to start testing**”*

Spokesman for Bioscientia Healthcare (private operator with 19 labs in Germany)



### 3 Resilience – Supporting New Customers

# There will also be opportunities to support and engage with new potential customers as they engage in new processes in response to Covid-19

## New Customer Opportunities

Many businesses are assisting with the Covid response by repurposing their manufacturing operations to produce in-demand products. These new products all require testing...

Ventilators /  
Breathing  
Equipment



PPE



Hand Sanitiser



... and TIC providers are assisting with these new customers and opportunities

- TIC providers **proactively seek out these companies** to assist with product testing and certification, eg:
  - QIMA is offering **free inspection of PPE production in China**
  - Element is providing **free testing for the ventilators** being manufactured by Rolls-Royce, Airbus and Meggit.
- This could then lead to **building longer term relationships and contracts** with these potential new customers

*“It’s critical that quality of these products be checked in a health crisis like this, and we believe **offering our inspections services free of charge in China on PPE products is the right thing to do.**”*

CEO, QIMA

*“We are delighted to be able to **offer our expertise, free of charge, to support the national effort to fight Covid-19.**”*

Divisional Director Global Aerospace PQT, Element



## 4 Bravery

# Growth opportunities are emerging for the medium term when the global situation stabilises; TIC players should be starting to plan for these now

Potential TIC Opportunities in the Medium Term

## Bravery (bold actions to emerge stronger)



### 4. Stimulate outsourcing and partnerships

- Testing demand amidst supply constraints has highlighted importance of third party providers
- Role to help reduce risk, variabilise cost, increase efficiency
- Customers and public sector reconsidering in-house asset base



### 5. Support recovering supply chains

- Rapid accreditations required as supply chains recover from major demand shock
- Assurance platforms will be critical to provide visibility and manage risk during the recovery



### 6. Consolidation opportunities

- Strong players will have opportunities to consolidate demand in fragmented market...
- ... through strategic customer conversations and roll-up M&A
- Diversified players may be reconsidering portfolio footprint



#### 4 Bravery – Stimulate Outsourcing and Partnerships

# There will be increased demand for outsourcing as customers recognise third parties' roles in the Covid testing response

## Increased Demand for Outsourcing

### In-house and government provision suffered significant challenges during the Covid crisis



**Supply constraints due to staffing and materials shortages**



**Inflexible capacity, unable to adapt to surges or lack of demand**



**Reconsideration of non-core assets & functions**

**“When demand exceeds our ability to deliver timely results, it’s in patients’ best interest for clients to send tests to laboratories with sufficient supplies to deliver fast turnaround times.”**

CEO, ARUP Labs (US University Lab)

**“While the CDC and our nation’s public health labs are making valiant efforts ... , these labs could become overwhelmed as the number of suspected cases grows.**

Director, BARDA.

### Outsourcing will become more attractive in light of Covid’s impact, due to:

**1**

**Heightened awareness of third party capacity in TIC and new outsourced relationships with government authorities**

**2**

**Increased efficiency and specialisation from outsourced providers**

**3**

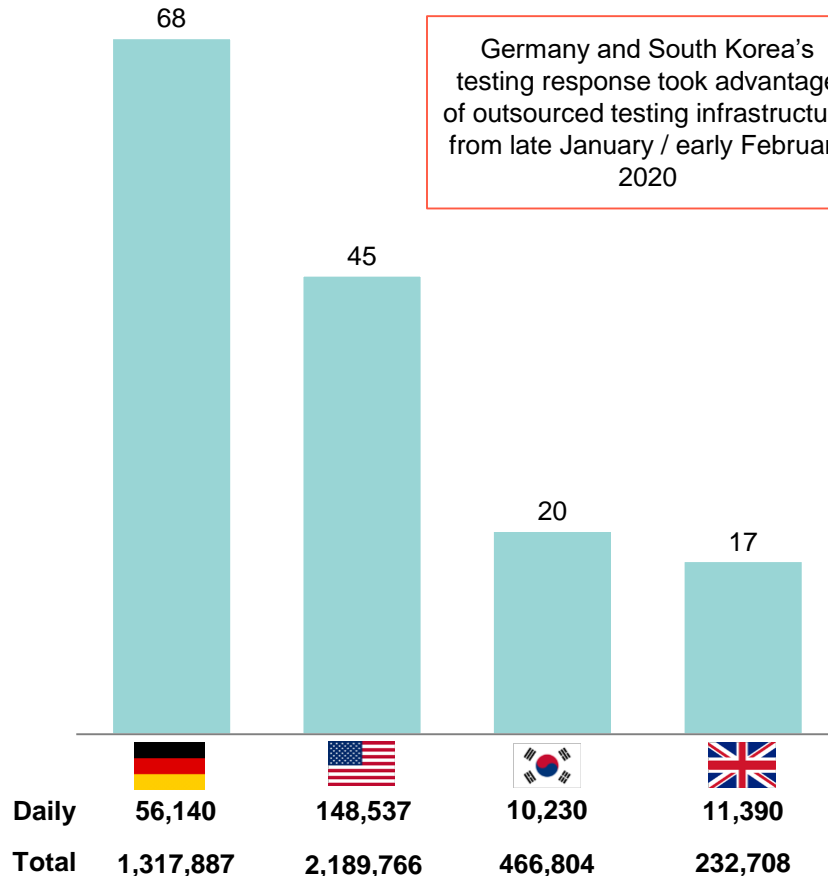
**Cost base becomes variable (particularly if customers are trying to conserve cash)**



4 Bravery – Stimulate Outsourcing and Partnerships

# Backup: Private Labs have been central to expanding Covid testing capacity in countries with the most aggressive responses

Daily COVID-19 Tests by Geography  
 (# Tests Per 100,000 People)<sup>1</sup>



Germany and South Korea's testing response took advantage of outsourced testing infrastructure from late January / early February 2020

## 3rd Party Covid Testing Involvement

- Countries that have introduced the broadest testing regimes have **been able to leverage third party testing infrastructure and the efficiency of outsourced provision:**
  - Germany has reported tests from 176 labs, allowing free tests at high volume commercial labs
  - South Korea enlisted commercial labs for testing from late January, when infection rates were still low
  - USA has more than doubled number of tests over w/c 30 March by reaching out to the private sector, particularly Quartz which leads testing in California
- Governments initially slow to incorporate the public sector are increasingly recognising the **necessity of outsourced facilities to meet required capacities**
  - eg Having failed to respond to APHA requests in January, Public Health England's COVID testing strategy from early April involves the private sector

*“Even if you weren't a testing company before, you need to become a testing company now”*

Matt Hancock, UK Health Secretary

*“Conversion is possible very quickly so long as government assistance is given with chemicals, methods and standards”*

TIC Player ex-CEO

1. Germany – week up to 5<sup>th</sup> April, USA & US – week up to 8<sup>th</sup> April, South Korea – week up to 6<sup>th</sup> April  
 Source: Interviews, Public Health England, COVID Tracking Project, Robert Koch Institute, OC&C analysis





5 Bravery – Support recovering supply chains

# TIC players will have a large role to play as customers adapt their supply chains to the recovery

## Supporting Supply Chains

### Customer face a series of challenges affecting their supply chains

#### Getting globalised, supply chains back to work

- **Global, JIT supply chains have been disrupted** across industries and customers face **delays in getting them back on track**



*Issued company statement after smartphone supply chains were hit by Malaysia and China factory*

#### Growing scrutiny of complex supply chains

- Customers want **greater visibility** of their supply chains and to **understand risk areas better**

*"We need to focus our efforts on securing supplies, manufacturing and logistics every step of the way"*

Ulf Schneider, CEO



#### Demands for higher standards and accreditation


- **Above and beyond existing regulation**, customers want to know that their **supply chains can survive future shocks**

*"COVID-19 has heightened awareness of the importance of being prepared, and crisis management,"*

British Standards Institute



### TIC providers should adapt their services to meet these demands

- **Assurance platforms** will be critical in providing end-to-end visibility and managing risks in supply chains
  - Most assurance platforms today are generic, with little value-add; uptake is low and winners are yet to emerge..
- **Foodchain**

  - ... but smaller, sector-specific providers are beginning to gain traction, eg Foodchain provide blockchain-based assurance to track food products 'from farm to fork'
- **New accreditation** above regulatory standards will provide more confidence in supply chain resilience
  - Intertek offer assured, a cybersecurity accreditation as there are currently no certification marks available
  - UL offers the UL-EU mark as a voluntary safety standard for production of products sold in the European market



### 3 Vision

# Planning now is critical to take advantage of some of the deep structural shifts that are likely to be accelerated as we emerge from the COVID-19 crisis

Upcoming Structural Trends to Plan For

## Vision (in tomorrow's world)



### 7. Increased use and acceptance of virtual or remote inspection

- Remote inspection and monitoring enabled by technology (eg, drones, virtual audit, continuous monitoring)
- Will require regulatory, accreditation frameworks to evolve



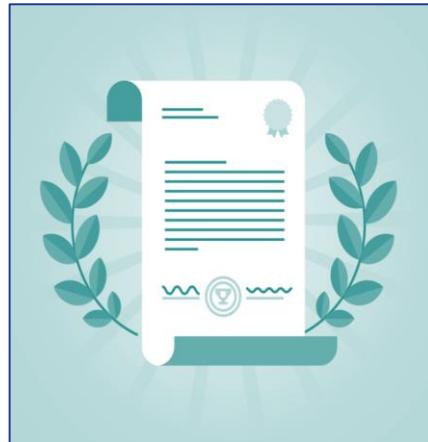
### 8. Supply chains reconfiguring

- Focus on resilience and flexibility
- On-shoring, diversification of suppliers likely response to long single-source supply chains and reliance on China
- Will drive increased demand for end-to-end visibility and rapid accreditation and assurance



### 9. Paradigm shifts in customer behaviour

- Increased demand for digital and cyber testing (less travel, more digital interactivity)
- More automated processes shift balance of testing & accreditation
- Focus on sustainability and resilience increases demand



### 10. Customer demands ahead of regulatory minimum

- Post-pandemic, expectations (and paranoia) of consumers will be heightened, and the role of accreditations to guarantee safety will be key for manufacturers
- Potential need to develop new product promises e.g. tests how long viruses live on certain surfaces



## 7 Vision – Automation and Remote/Digital Processes

# The pandemic highlights the need to accelerate the shift towards automation and remote inspection processes

### Case Study: Bureau Veritas & PHMSA Remote Inspection

#### Bureau Veritas Drone Inspection

- Drones offer the ability to remotely access structures and tight spaces and produce more accurate digital models of buildings and structures
  - Health and safety, improved quality and time saving benefits
- Bureau Veritas has recently used drones in their inspections:
  - Completed inspection of all 12 sides of the 4 towers of a cable car linking 2 French ski resorts in just 5.5 hours vs previous slow and fastidious process reliant on rope technicians
  - Close-up inspection and survey conducted in the two cargo hold spaces of a bulk carrier, which included ultrasonic thickness measurements
  - Water tank inspection and servicing



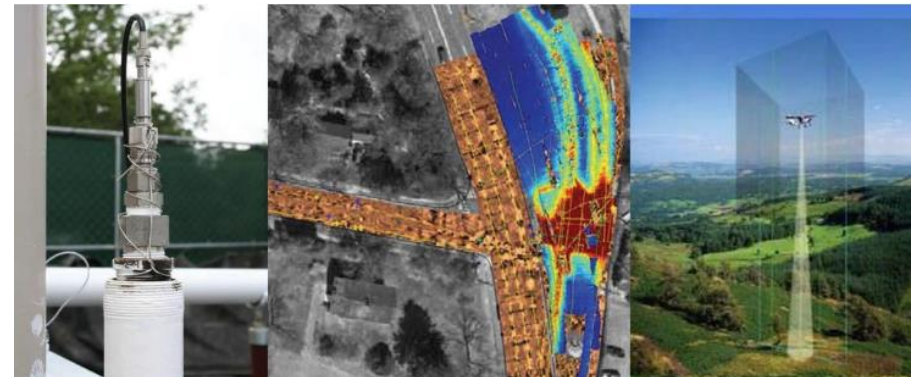
**Bureau Veritas Group** @bureauveritas · Mar 24  
 Drone: round n°2 with a water tank inspection. The drone provided rapid and secure access to the equipment in order to return it to service after a low standstill.  
 Read our article on how they revolutionize the inspection profession:  
[group.bureauveritas.com/magazine/drone...](http://group.bureauveritas.com/magazine/drone...)



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#### PHMSA Remote Inspection and Repair

- PHMSA has been investing in R&D on technologies to help with remote surveying and testing of pipeline systems
- Have developed technologies which enable:
  - Threat prevention – early detection of pipes underground to reduce excavation and construction damages
  - Leak detection – tools and systems to externally locate, identify, and assess leaks, thereby improving safety and saving time
  - Anomaly detection and characterisation – non destructive and robotic methods to detect corrosion, dents and stresses in pipes
  - Welding and repair – automated welding system for use on in-service pipelines



8-10 Vision – Supply Chain Shifts & New Accreditations

# As customers consider more significant, longer-term changes to their supply chains, TIC providers will need to offer new solutions and accreditations

## Structural Supply Chain Impacts

### Potential longer-term impacts

#### Reducing single source reliance

- **Significant dislocation** caused by Covid is causing companies to **rethink long, single-source supply chains, eg:**
  - Diversification of supplier base
  - Greater demands for resilience and flexibility in suppliers

#### Re-shoring

- Companies will investigate **moving manufacturing and supply chains onshore to minimize risk**

*“(COVID-19) will tip the balance more towards trying to mitigate risk, which means **going to the low-cost producer and giving them 100% of your demand may look very risky now.**”*

Morris Cohen, Professor of Operations, Wharton

#### Customer-driven standards

- TIC players have a role to play in **developing new standards and propositions** to meet customer and consumer expectations which are ahead of the regulator
  - **eg, SGS** introduced a new app QiiQ for remote supply chain assurance and quality control

### Questions to Consider

- Which **end sectors** are most likely to make significant changes to supply chains?
- How would you meet **new re-shoring-led demand** for TIC services?
- Where are existing standards and accreditations **behind the curve**?
- Which new tests could meet changes in **consumer expectations**?





*Any  
Questions?*

*Appendix:  
Supporting Detail on  
End Markets*












Impact on TIC End Markets

# These factors combine to drive significant variation between end-markets in the severity and expected duration of impact on TIC spend

TIC Customer End Sector Assessment

 Short-term increase 
  Limited impact 
  Medium-term decrease 
  Longer-term decrease

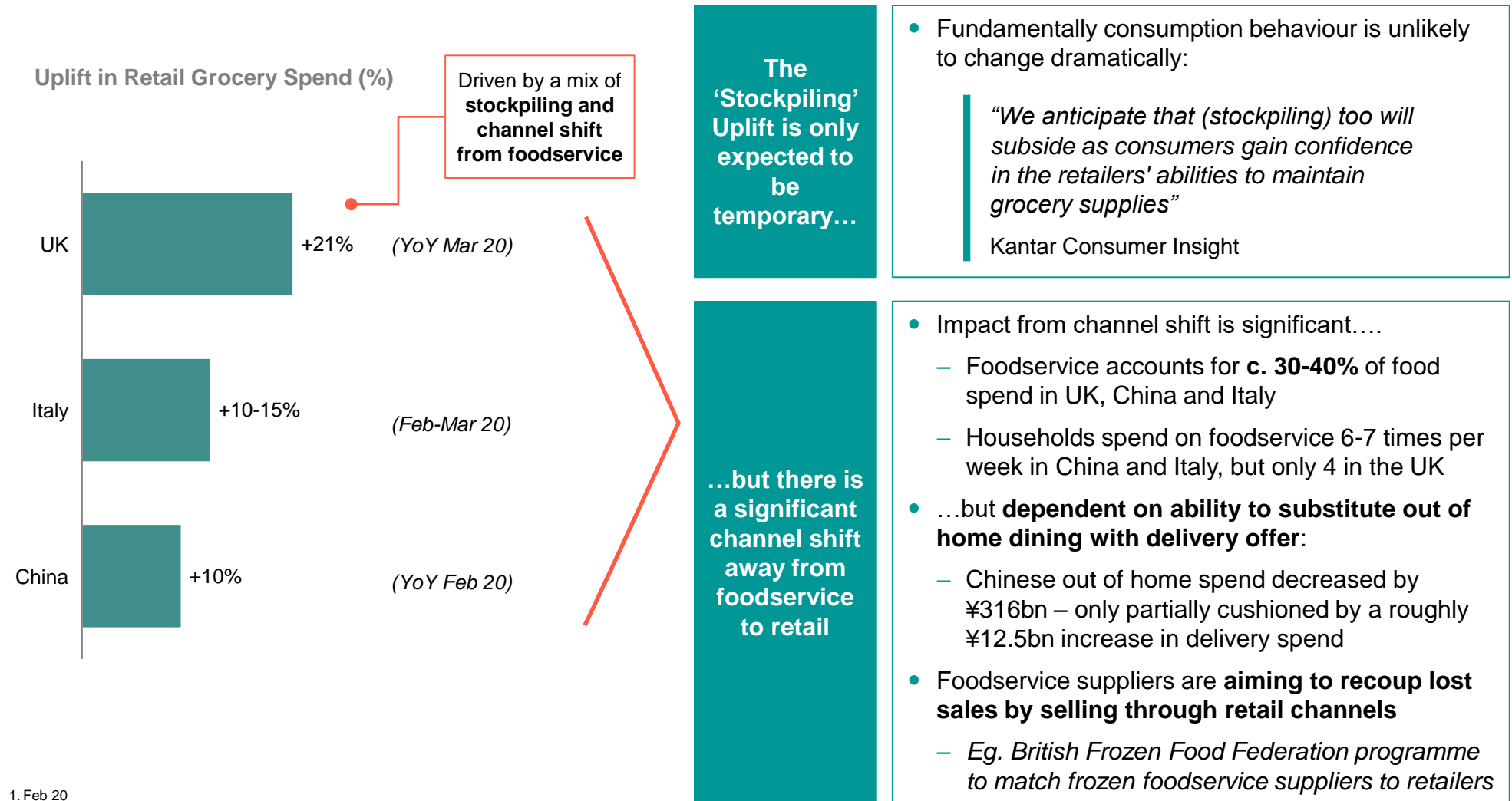
		COVID-19 Impact on End Market			Impact on TIC Spend	Commentary
		Severity of End Market Impact (%pts)	Duration of Impact (months)	Shape of Recovery		
Resilient / Critical	Food & Agriculture	+10-20% (Grocery Spend)	0-3	N/A		<ul style="list-style-type: none"> <li>Short-term uptick in production from stockpiling, but long-term minimal impact</li> <li>Channel shift from foodservice to grocery benefits TIC spend by increasing labelling (and therefore nutritional testing) requirements</li> </ul>
	Pharma / Life Sciences	+2-6% (EU Healthcare Spend)	3-6	N/A		<ul style="list-style-type: none"> <li>Increased spending on healthcare as a result of the virus; however mostly on low profit margin products (facemasks etc)</li> <li>Supply constraints limit potential for TIC benefit from rise in demand</li> </ul>
Short-term Challenges	Marine	-20% to -30% (China marine traffic)	0-3	V-Shaped		<ul style="list-style-type: none"> <li>Fast rebounds have been seen after ports and shipyards closures led to drops in activity</li> <li>TIC spend is regulatory-driven and likely to be maintained at existing levels</li> </ul>
	Construction	-15% to -30% (China Real Est Investment)	3-6	V-Shaped		<ul style="list-style-type: none"> <li>Short-term disruption as sites close, but most projects delayed rather than cancelled so TIC spend expected to hold firm</li> </ul>
	Consumer Goods	-10% to -40% (Retail sales)	3-6	V-Shaped		<ul style="list-style-type: none"> <li>Sharp initial decrease due to lockdown conditions leads to short-term production TIC decrease; R&amp;D and innovation still fundamental so TIC spend protected</li> </ul>
Medium-term Recovery	Mining & Minerals	-5% to -10% (China base metal production)	3-6	L-shaped		<ul style="list-style-type: none"> <li>Limited COVID impact as mining activity has been protected/deemed essential</li> <li>Recessionary impact could lead to reduction in exploration capex-driven TIC spending (although less sensitive than O&amp;G)</li> </ul>
	Automotive	-5% to -20% (Auto sales) <sup>3</sup>	6-12	L-shaped		<ul style="list-style-type: none"> <li>Production hit from factory closures &amp; supply chain challenges</li> <li>Both consumers and businesses holding off on purchasing, with economic uncertainty delaying purchase volumes over the medium-term</li> </ul>
Enduring Impact	Oil & Gas	-20% to -40% (O&G Revenue) <sup>3</sup>	6-12	L-Shaped		<ul style="list-style-type: none"> <li>Production likely to see a short-term hit due to labour shortages from virus</li> <li>New projects more at risk, up to 2/3 expected to be cancelled</li> </ul>
	Aerospace	-30% to -55% (Airline Revenue)	12+	U-Shaped		<ul style="list-style-type: none"> <li>Tighter travel restrictions vs previous epidemics leads to deeper impact, with knock-on impact on MRO spend;</li> <li>Liquidity issues for airlines likely to impact order books and lower oil price could push airlines to continue operating older (less efficient) aircraft, decreasing R&amp;D TIC spend</li> </ul>



Impact on TIC End-Markets – Food & Agriculture

# Food retail has seen a demand uplift of 10-20% in affected markets – in part driven by stockpiling and in part from channel shifts away from foodservice

## Covid Impact on Food Demand



1. Feb 20

Source: Euromonitor, Kantar, Nielsen, National Bureau of Statistics of China, OC&C analysis

Impact of the Covid-19 crisis on the TIC sector 2020-04-13 | © OC&C Strategy Consultants 2020



# Short term TIC businesses should benefit from increased volumes and nutritional labelling demand as well as likely supply shock protection

## Covid Impact on Food & Agriculture TIC Market

1

**Significant volume benefits** (majority of TIC is production related) – but uplift in overall food demand will **abate in the short-to-medium term**

2

Channel shifts from foodservice towards grocery retail provide **short term opportunity in nutritional testing** – dependent on geographical regulation

- Foodservice supply chain requires less stringent labelling – suppliers selling into the retail value chain will need to adopt higher standards

3

Food & Agri supply chains are **unlikely to suffer dramatic supply-side shocks** given national strategic importance / likelihood of government intervention:

- **Agri:** some potential for summer harvest picker shortages (affecting output inspections) – but seed prep, harvest management, lab testing are unlikely to be affected
- **Food:** innovation focused services likely to experience significant short term slump as retailers rush to fulfil volumes & focus on core ranges, but should resume ‘post bump’
- **Regulations are unlikely to be relaxed** to meet demand

*“I think you will see ranges tightened by up to 30 per cent [to meet demand]”*

CEO Greencore

*“Food safety practices in food processing plants should continue to be delivered”*

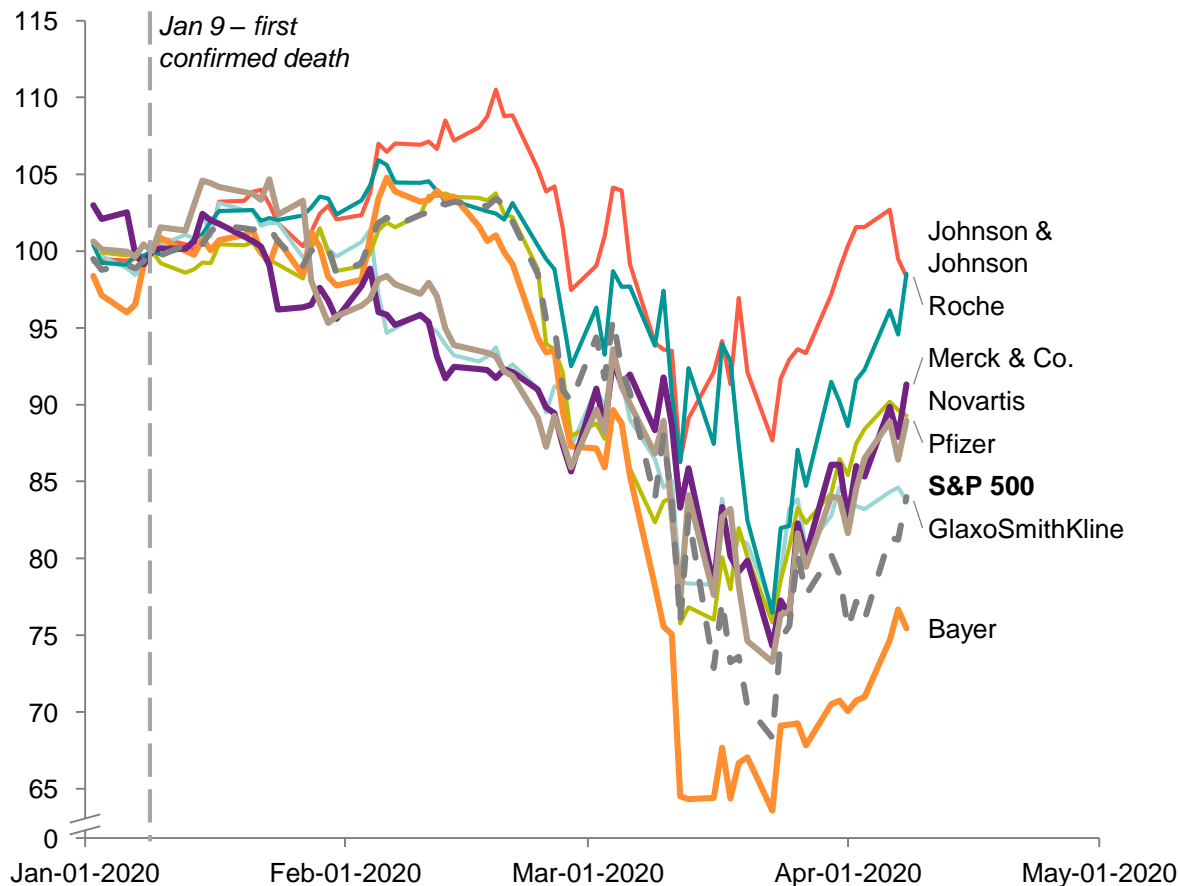
FSA Coronavirus Guidelines

Impact on TIC End Markets – Pharma / Life Sciences

# Pharma majors have suffered alongside the market, but should be resilient due to sustained / increased demand once supply chains are addressed

## Performance Of Pharmaceutical Industry

### Major Pharmaceutical Companies Stock Performance Against Market<sup>1</sup>



### Pharma sees moderate Covid-related upside

- Even though the major pharmaceutical firms have suffered alongside the market, they **are expected to be resilient in the short term**
  - Both governments and consumers increased spending on pharma and personal hygiene in response to the pandemic (e.g. In Italy this spending has increased 112% YOY)
- “We see limited downside and potential significant upside for shares when broader market dynamics stabilize.”  
JPMorgan Pfizer Analyst Report
- Rather than demand issues, **supply-side issues from labour and material shortages present a greater challenge**
- However in the medium term, the broader economic outlook and subsequent financial impact will likely **soften the upside** for these companies
  - Investment in R&D and growth opportunities are reliant upon overall economic performance and financial health

1. Indexed to 100 = Jan 9  
Source: Capital IQ, OC&C analysis

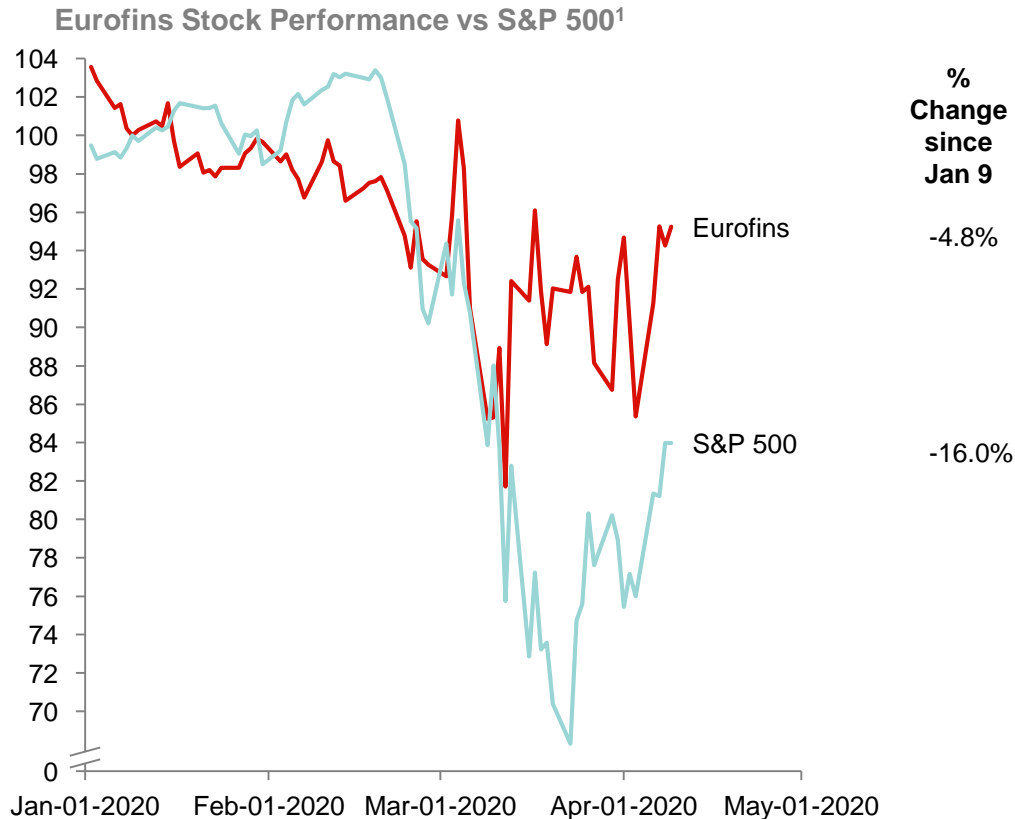




Impact on TIC End Markets – Pharma / Life Sciences

# Pharma-focused TIC players on the other hand have benefitted from demand for testing and are currently only limited by their own capacity

## Covid Impact on Pharma & Life Sciences TIC Market



1. Indexed to 100 = Jan 9

Source: Desk Research, Expert Interviews, OC&C analysis

### Expected Impact On TIC Spend

- The **demand for testing products and services in pharma / life sciences remains high**, especially for PCR testing related to diagnosing COVID-19
  - E.g. Eurofins is specialised in this area and consequently has performed significantly better than the market since the onset of the crisis

*“Business is steady, and we see a modest uptick at our labs, particularly in protective barriers testing.”*  
Life Sciences Testing Provider
- **Concern lies more around the capacity** for companies to provide TIC services as opposed to demand with providers now exploring ways of expanding capacity to meet demand.
  - North American labs shifting towards skeleton teams, due to the non-essential nature of their work, and therefore becoming capacity constrained

*“Avenues to help would be to partner, subcontract, etc to bring people outside of TIC to assist with capacity”*  
ACIL Member
- There has been **little impact on clinical trials**, which will continue to need certification
  - Only 2 out of 315 US trials set to finish in 2020 have been cancelled



# The Chinese maritime industry was hard hit by quarantine measures – but has been quick to rebound - sea trade remains key to global sourcing

## Covid Impact on Chinese Marine Industry

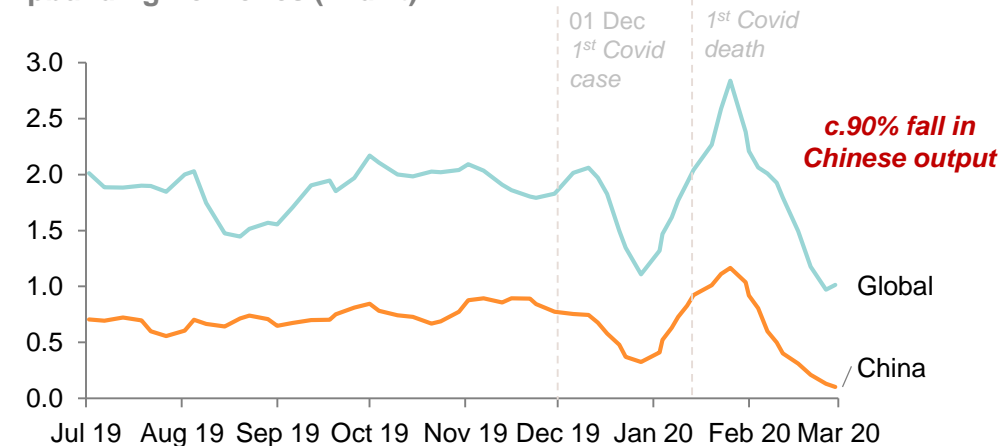
### Resilience seen in Chinese marine industry - global trade reliant on shipping

- **Staff quarantine** acts as biggest barrier to operations...
  - Chinese traffic fell c.25% & shipyard output fell c.95% during the quarantine
- ...but operations have been **quick to rebound**:
  - Trade has rebound higher (sea trade remains key, accounting for **90% global trade**)
  - The Chinese CSSC shipyard (largest global shipbuilder) reports 90% resumption rate
- **Longer term outlook mixed**:
  - Trade broadly neutral – estimates range **+0.9%** to **-3.2%** yoy seaborne trade growth
  - Global Orderbook estimated to decline **-15%** by year end (although **delivery rate unlikely to scale back as significantly short term**)

Marine Traffic (# Port Calls, Index)



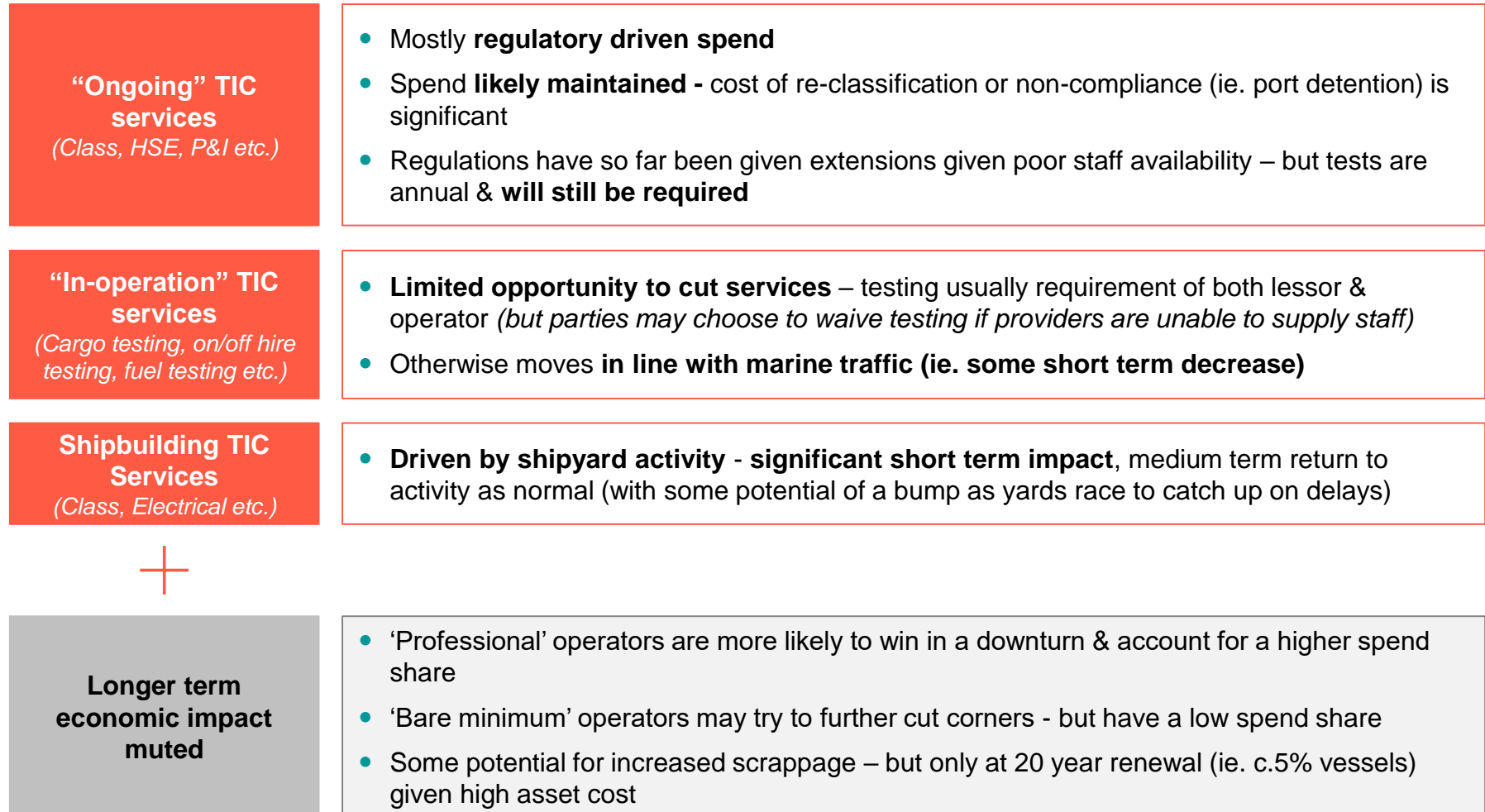
Shipbuilding Deliveries (m dwt)



## Impact on TIC End Markets – Marine

# The marine industry already adopts a ‘bare minimum’ approach – ability to cut TIC spend in the short term is limited

## Covid Impact on Marine TIC Market

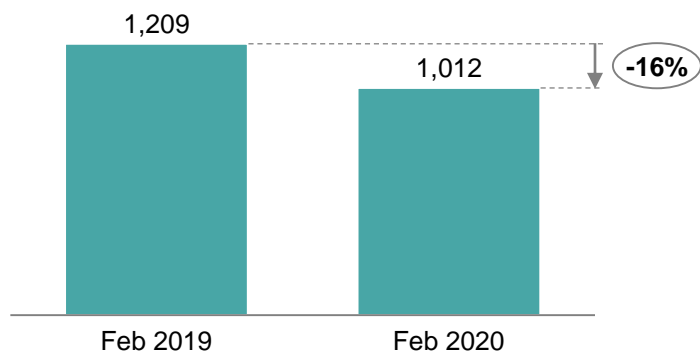


Impact on TIC End Markets – Construction

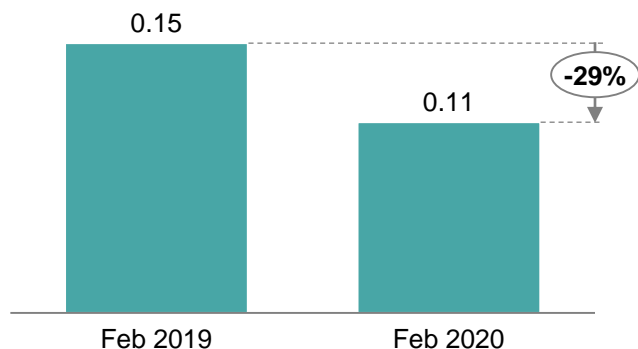
# Demand for TIC in construction is likely to be more a case of postponement due to site closures rather than structural loss of demand

## Covid Impact on Construction TIC Market

Investment Chinese Real Estate (bn yuan)



Sales of Real Estate Land Purchased in China (mn sqm)



### Expected Impact On TIC Spend

- **Construction TIC will be hampered by project delays and some short-term broader economic uncertainty...**
  - Building site closures due to pandemic will delay completion of projects and therefore TIC construction testing
    - *Eg. most large infrastructure projects in the UK are suspended; Manitou Group has paused operations in France, Italy and India*
  - Sales and investment have declined due to economic uncertainty from virus
    - *New mortgage offers have been withdrawn in the UK & estate agents are being prevented from making home visits*
- However the **fundamentals of the construction industry are unchanged**, (assuming the world does not slip into a global recession) **so the industry is expected to recover post-virus**, as will its need for TIC support
  - UK demand for housing and gov. committal to large infrastructure projects is significant
  - 90% of key construction projects in China have resumed
  - Larger infrastructure projects are long term so insulated

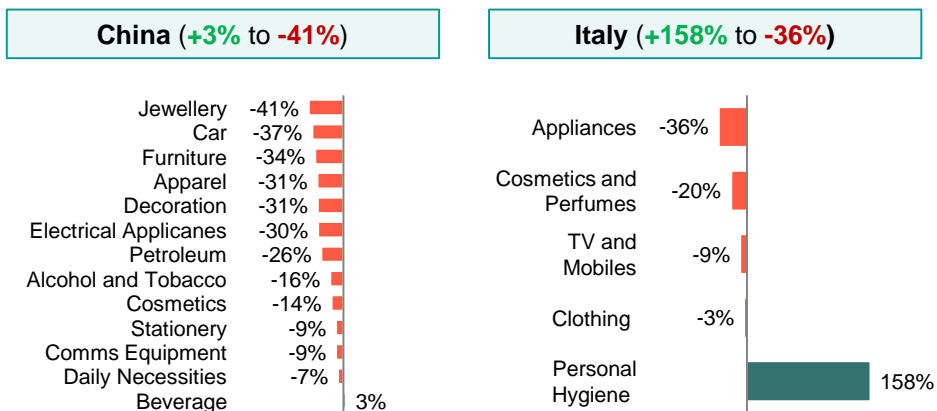


Impact on TIC End-Markets – Consumer Goods

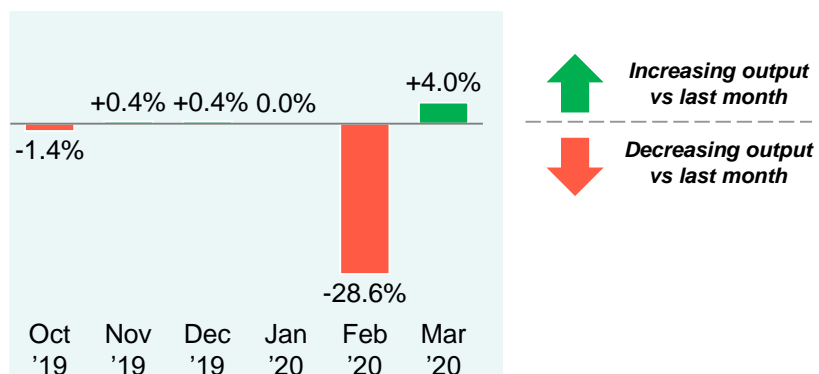
# CG TIC spend has been severely affected – but varies heavily by category; there may be pockets of regional growth from shifting supply chains

## Covid Impact on Consumer Goods TIC Market

Retail Sales Growth by Category (% YoY Feb 20)



Chinese Manufacturing PMI Index<sup>1</sup> (% Growth MoM)



### Impact on TIC

- **Production based TIC will be heavily affected** - consumer goods sales have fallen dramatically in affected countries:
  - Sales have **fallen up to 40%** for non essential goods
  - ...although some categories have been resilient (daily necessities, personal care)
  - Production has been slow to ramp back up (overall Chinese manufacturing is **still down c.25%**)
- Relative flexibility of CG supply chains may drive:
  - **Short term pockets of TIC growth** as production is shifted to less affected countries (eg. *Textiles / Apparel from Bangladesh / India* – which may be impacted longer)
  - **Longer term shifts in spend footprint**– driven by a need for greater supply chain security
- Discretionary/Innovation-related TIC spend is **likely to be better protected** (beyond short term dips from staff shortages) – **dependent on category competition & broader economic outlook**

1. The Purchasing Manager's Index (PMI) is a month on month survey based measure of sentiment on manufacturing activity  
 Source: GroupM, National Bureau of Statistics of China, OC&C analysis

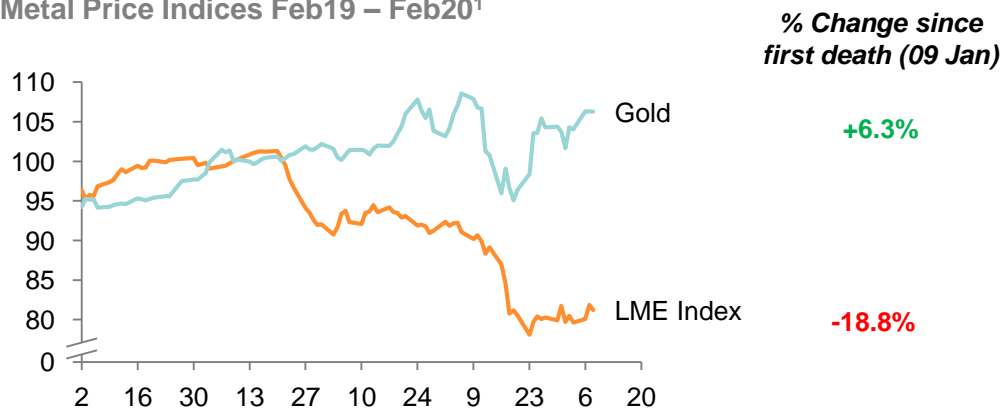


Impact on TIC End Markets – Mining & Minerals

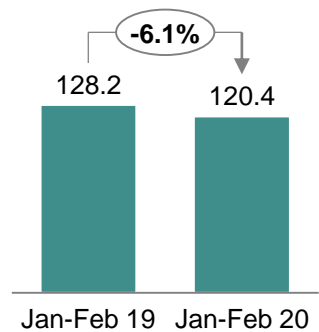
# Operational TIC will only see a short-term hit due to labour shortages, but Exploration could see a longer-term cut if commodity prices do not rebound

## Covid Impact on Mining & Minerals TIC Market

Metal Price Indices Feb19 – Feb20<sup>1</sup>



Chinese Base Metal Production (mn tons)



- **No significant evidence of production slowdown to date...**
- ...And companies have been cautious to completely halt operations
  - *Rio Tinto only plans a 21 day suspension in its South African mines*
  - *Anglo-American expects production at South African Kumba Iron Ore mine to drop, but continue*

### Impact on TIC

- **Exploration-related TIC (c.70% TIC Spend):**
  - Capex decisions biggest driver on spend - many TIC exploration services (eg. minerology) can be achieved remotely
  - **Likely significant short term scale back** until economic situation becomes clearer (with potential for minor spend in precious metals)...
  - ...but longer term spend highly dependent on economic outlook (esp. in China) – LME Price index has **already fallen c.20%**
- **Production-related TIC (c.30% TIC spend):**
  - Extent of closures **dependent on economic importance** (eg. Ecuador / Canada have classed mining as essential services – limiting closures)...
  - ...but minimal evidence of significant impact so far
  - Majority of inspection remains manual – but existing moves towards automation (eg. in hyperspectral imaging, thermal testing etc.) likely to be accelerated

1. Indexed to Feb 2019

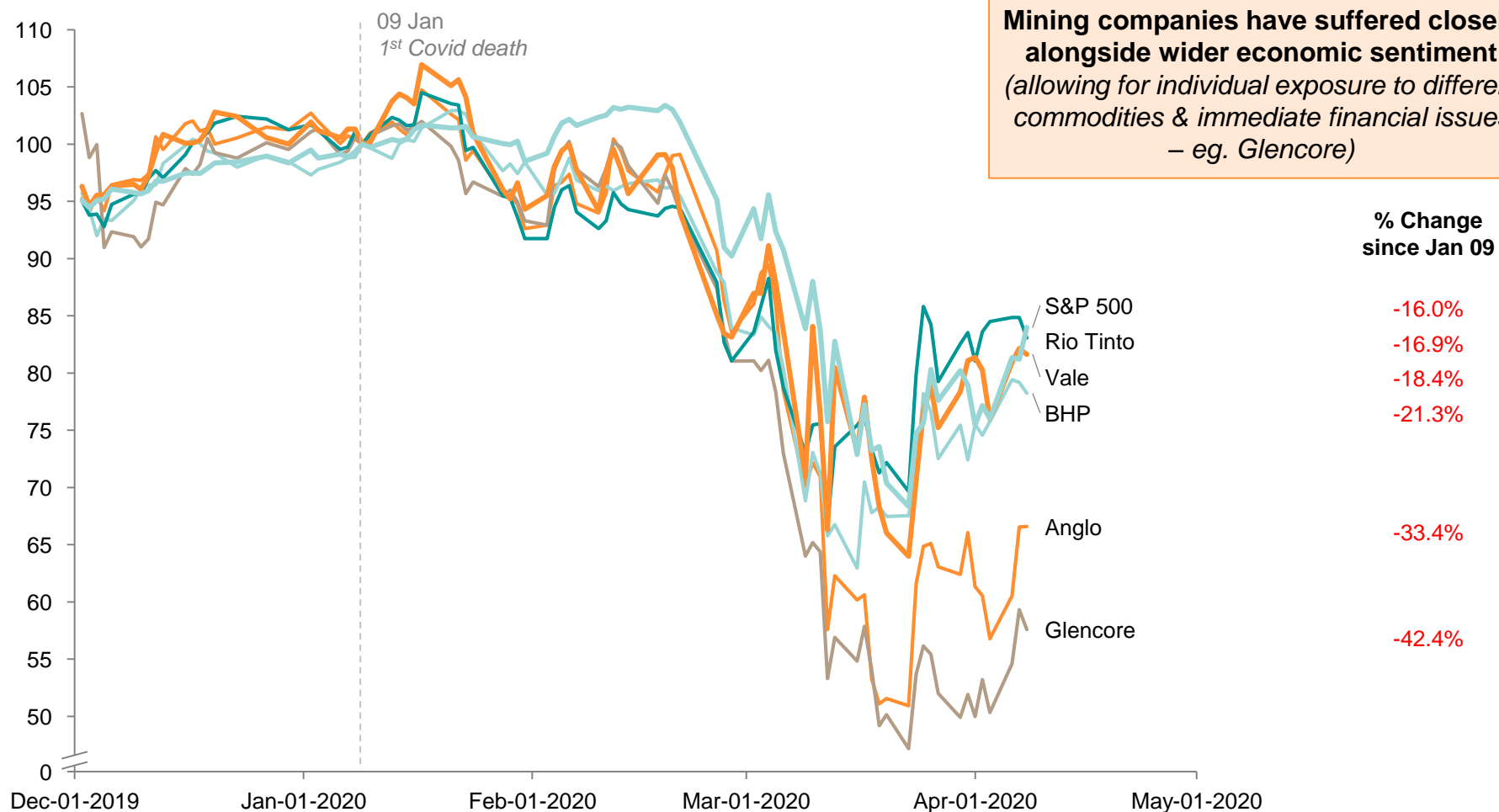
Source: National Bureau of Statistics of China, World Bank, OC&C analysis



Impact on TIC End Markets – Mining & Minerals

# Backup: Major mining companies have performed broadly in line with wider market economic sentiment

Share Prices of Major Mining Companies<sup>1</sup> up to 9<sup>th</sup> April 2020



1. Indexed to Jan 09  
Source: Capital IQ, OC&C analysis

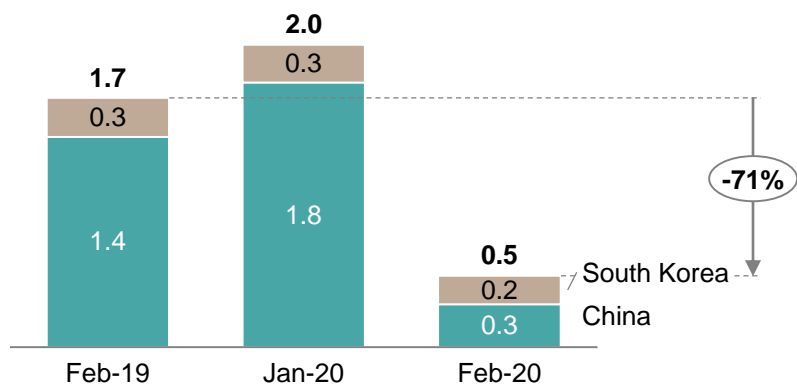


Impact on TIC End Markets – Automotive

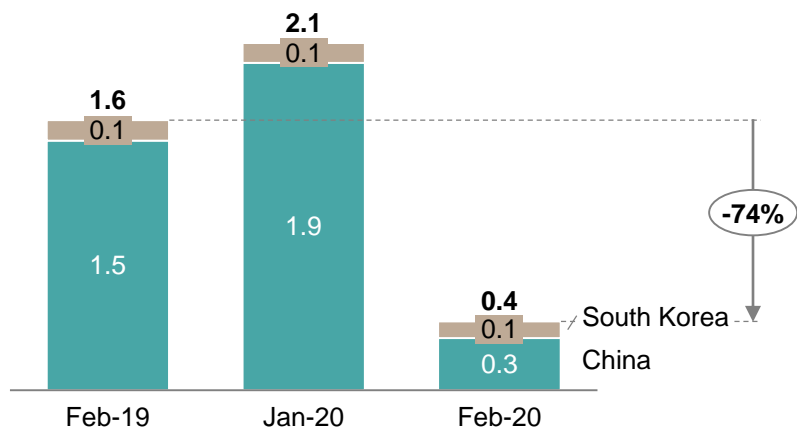
# Automotive has also been hit hard due to plant closures and supply issues, post-covid recovery will take time

## Covid Impact on Automotive TIC Market

Production Volumes in Early Affected Nations (m)



Sales Volumes in Early Affected Nations (m)



### Expected Impact On TIC Spend

- **Short-term significant impact to production TIC**
  - Factories rely on significant human labour – production has been scaled back significantly (70% plus)
  - Auto **supply chain is highly global** – so shutdowns are dependent on global quarantines lifting
    - *E.g. Hyundai forced to suspend production in South Korea, due to a lack of spare parts*
    - *Re-start of Wuhan (China’s ‘motor city’) may improve global supply chain situation*
  - Supply coupled with demand side shock – new cars are bought in dealerships
- **Longer term R&D and production related TIC may be significantly impacted due to economic outlook:**
  - Lower vehicle demand and supply chain difficulties mean production will take time to recover
  - **Urgency & competition in EV transition suggests R&D budgets & related TIC will be somewhat protected**

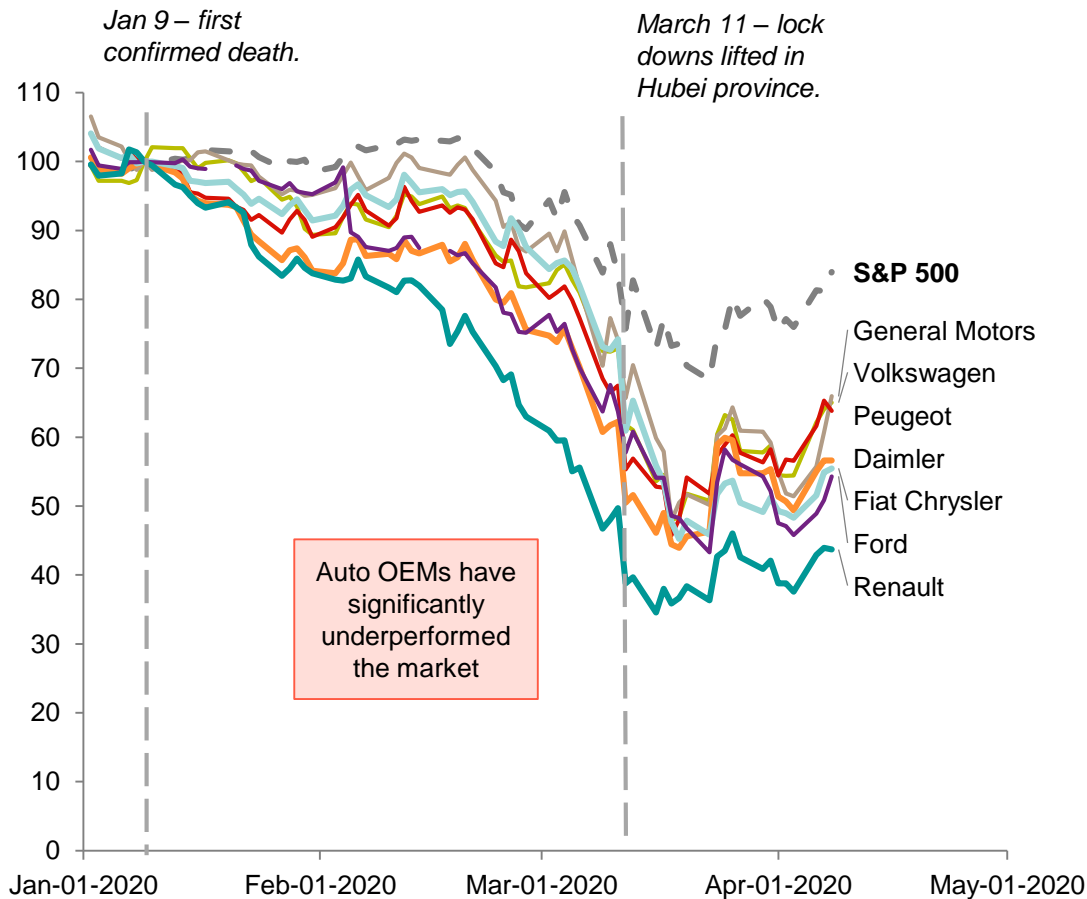




Impact on TIC End Markets – Automotive

# Backup: While share prices for automotive OEMs have declined since the onset of Covid-19, there are already some signs of recovery

Auto. OEM Stock Performance Against Market<sup>1</sup>



## OEMs are expecting a protracted recovery

- Short term shutdowns are causing significant losses for OEMs....
  - “VW makes a Q2 operating loss of over €4bn... but the loss could be ~€9bn if the pending European lockdown lasted unabated for the entire quarter”  
Commerzbank Equity Analyst Report
- ...longer term It will take time for consumer and business demand to return, given the hit to employment and greater macro-economic uncertainty that the crisis has caused
- However production is starting back up in China:
  - Honda and Nissan have both resumed operations in Hubei province (where the virus emanated)
  - Renault has started manufacturing again in Wuhan and Volvo has reopened all 4 of its factories in China
  - OEM share prices have started to slow recent declines

1. Indexed to 100 = Jan 9  
Source: Capital IQ, OC&C analysis



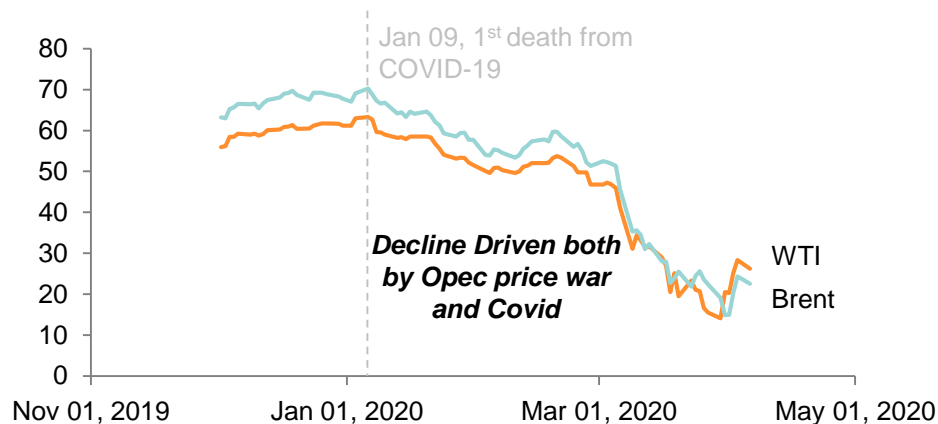
Impact on TIC End Markets – Oil & Gas

# Covid alone is forecast to have minimal impact on O&G TIC, but the OPEC price war may cause a significant sustained reduction in TIC spend

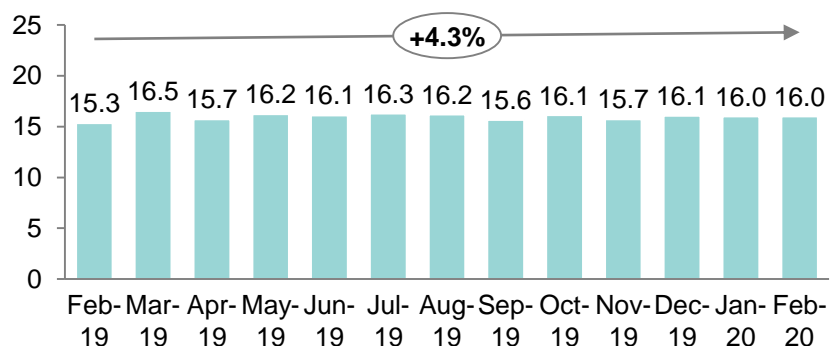
## Covid Impact On Oil & Gas TIC Market

## Jan-Feb Chinese oil output data extrapolated from accumulated data

Crude Oil Spot Price (\$ per barrel)



Chinese Crude Oil Output (million tons)



### Expected Impact On TIC Spend

- **Production-based and facility testing should be relatively insulated (from Covid alone)...**
  - Declines will be short-term supply side issues with labour shortages (but minimal decline experienced in China)
  - Facility testing unlikely to be impacted – facilities will remain open (cost of closure is significant)
  - Production may see knock-on medium term falling demand - Barclays predicts a 0.9m bpd drop for 2020 from Covid (**only c.1% global total**)
- ...but the **broader market oversupply & outlook** (caused by Opec, Covid & potential economic downturn) **may have a significant long term impact on testing:**
  - Low oil price will cause recent production oversupply (& related tic) to wind down to sustainable levels as producers go out of business...
  - Capex (& related TIC) is forecast to be cut up to 2/3
  - ...and long term capacity of the Oil & Gas subsector may not recover to pre-crisis levels

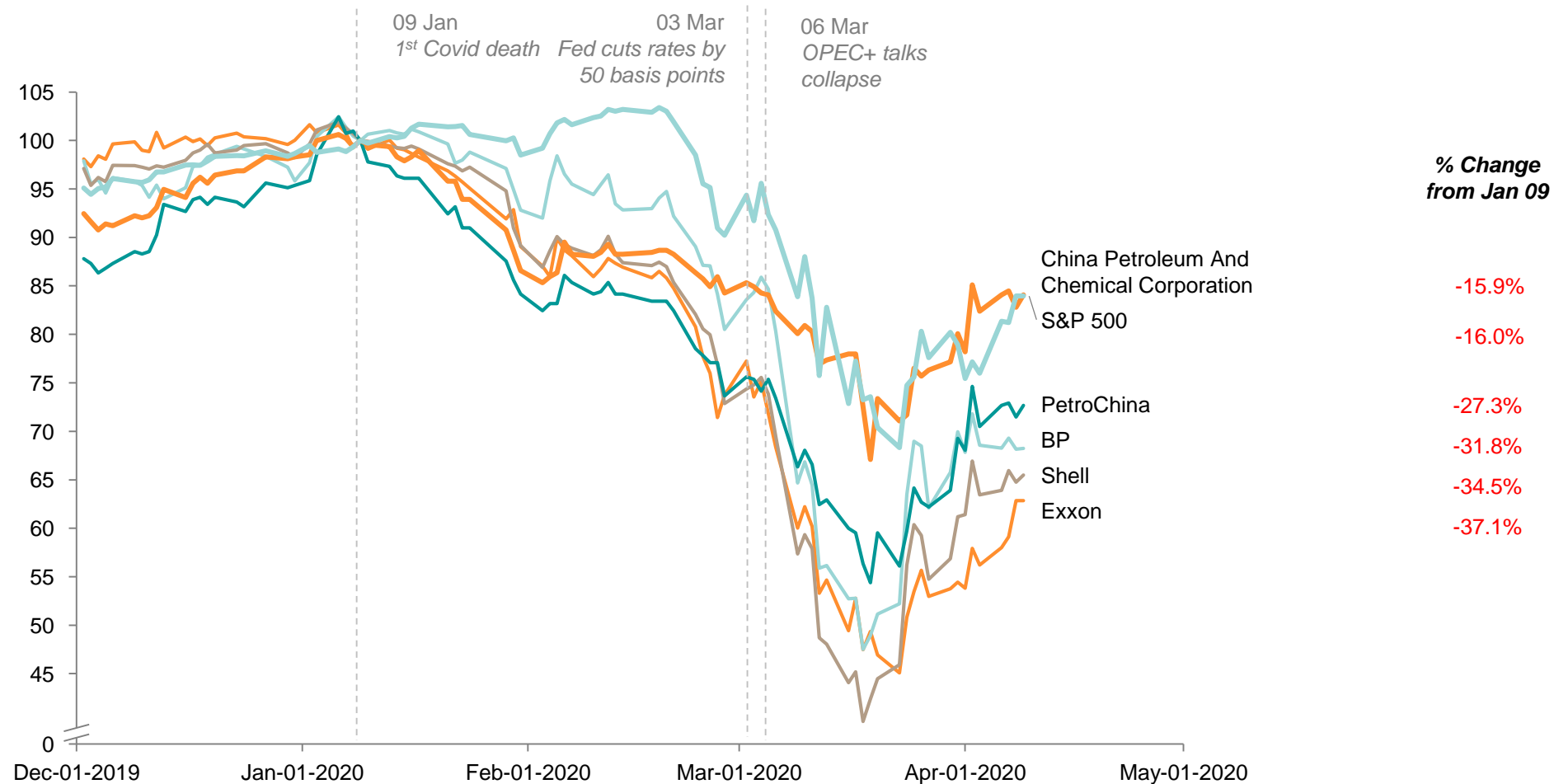


Impact on TIC End Markets – Oil & Gas

# Backup: COVID-19 and the OPEC+ Price War have resulted in O&G majors underperforming the S&P 500 though Chinese firms are recovering

Share Prices of Major Oil and Gas Firms (Indexed to 100)





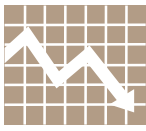


Latest as at 9<sup>th</sup> April, 2020



Impact on TIC End Markets – Aerospace

# The aerospace industry has been hit hard and fast by the pandemic and recovery is expected to be extremely slow due to longer term roll-on effects

## Covid Impact on Aerospace TIC Market

Short Term Impacts		Medium - Long Term Effects	
	<p><b>Insulation from Order Books</b></p> <ul style="list-style-type: none"> <li>No cancellations reported for Airbus in Feb 2020, while Boeing's were mainly related to 737 Max but orders have frozen and cancellations are likely</li> <li>Insulation in near term TIC demand due to long order books</li> </ul>		<p><b>Deteriorating Order Books</b></p> <ul style="list-style-type: none"> <li>10% of Airbus' order book was wiped out by 9/11 and JP Morgan anticipate 2-3x the impact</li> <li>Some scaling back in production possible – knock-on affect on TIC spend (capex &amp; eventually MRO)</li> </ul>
	<p><b>Scheduled Passenger Capacity Decline</b></p> <ul style="list-style-type: none"> <li>c.50% drop in global scheduled passenger capacity</li> <li>Some decline in MRO spend</li> <li>TIC players will also experience knock on impact from airline liquidity issues</li> </ul>		<p><b>Declining Spending on Aerospace R&amp;D</b></p> <ul style="list-style-type: none"> <li>Bailouts are likely insufficient to cover cash positions</li> <li>Falling oil prices reduce incentive to improve fuel efficiency</li> <li>Potential significant impact on R&amp;D TIC spend</li> </ul>
	<p><b>Share Price Drops</b></p> <ul style="list-style-type: none"> <li>Airbus / Boeing share prices have taken a bigger hit than the S&amp;P avg.</li> <li>Shares have fallen further than in previous stock crashes and aerospace-related shocks</li> <li>Reduces ability to finance major new capex expansion / related TIC</li> </ul>	 	<p><b>Increasing Technology Usage &amp; Rise in De-globalisation</b></p> <ul style="list-style-type: none"> <li>Forced push to teleconferencing may shift business travel demand (upto 50% trips at risk in China<sup>1</sup>)</li> <li>In-shoring of supply chains to reduce risk may reduce airfreight demand</li> <li>Long term growth prospects of airline production less certain &amp; may be scaled back – with knock-on affect on TIC spend</li> </ul>

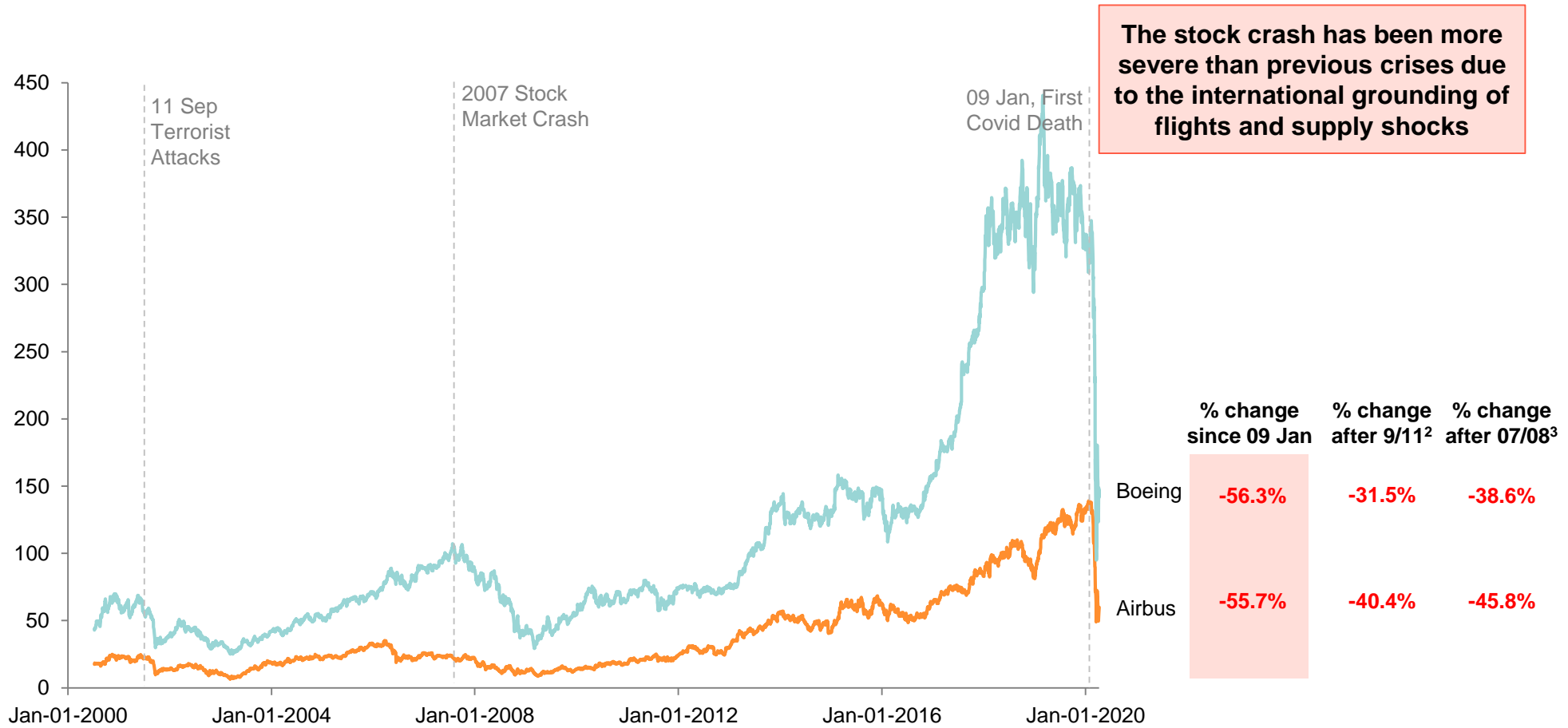
1. OC&C Consumer Survey on attitudes to business travel post Covid  
Source: Desk Research, IATA, Press Articles, OC&C analysis



Impact on TIC End Markets – Aerospace

# Backup: The COVID-19 shock to aircraft share prices has been greater than in previous stock market crashes

Share Price of Airbus and Boeing 2000-2020 (\$ per share)<sup>1</sup>



1. Up to 8<sup>th</sup> April 2020  
 2. From 10<sup>th</sup> September to 20<sup>th</sup> September 2001  
 3. From 9<sup>th</sup> October 2007 – 27<sup>th</sup> June 2008

Source: Capital IQ, OC&C analysis

