

COVID-19 Impact on Commercial Vehicle and Off- highway Equipment Production

Some thoughts



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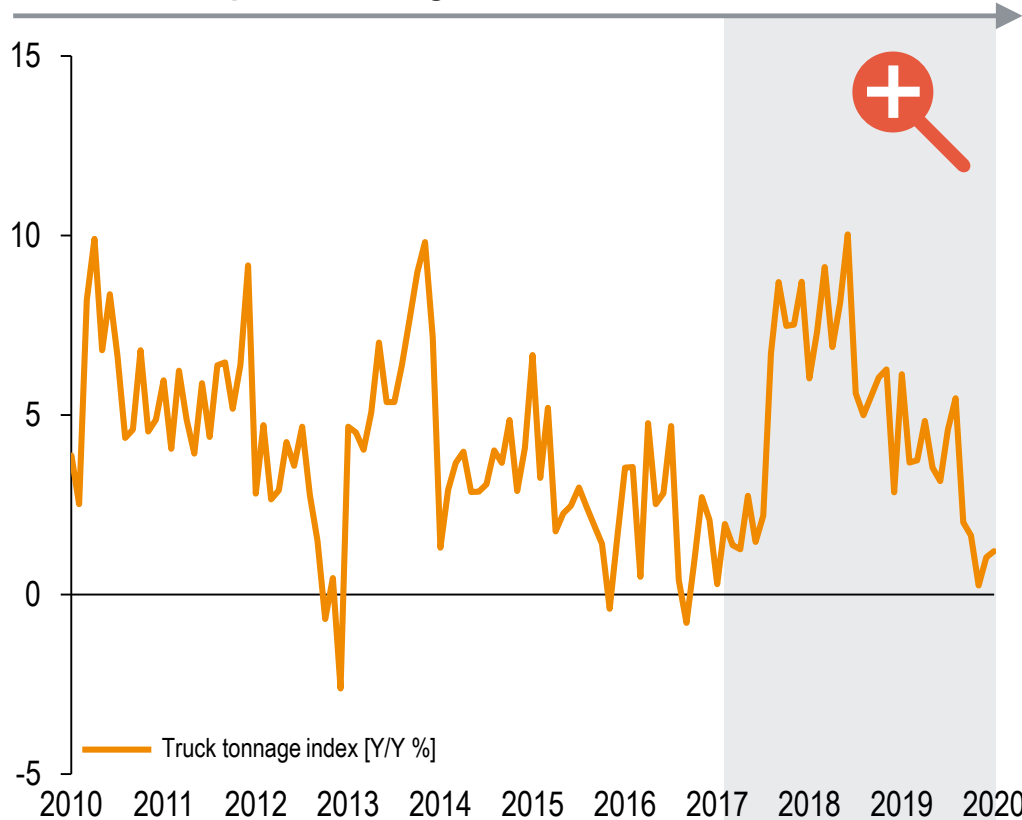
A. COVID-19 impact on Commercial Vehicles



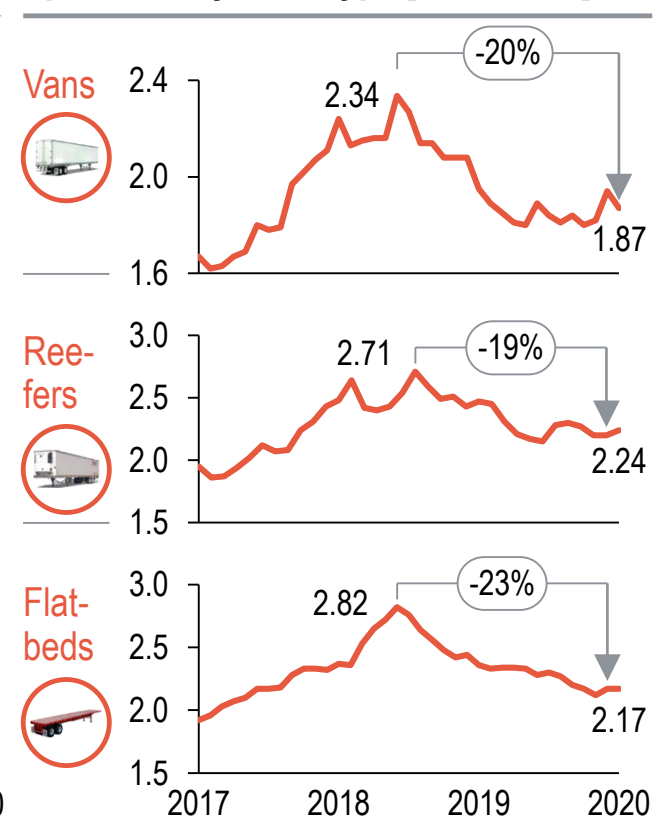
Even before the onset of COVID-19, growth in the US trucking market had been trending down after peaking in mid-2018

US on-road freight market (pre-crisis)

On-road transport volume growth



Spot rates by truck type [USD/mile¹]

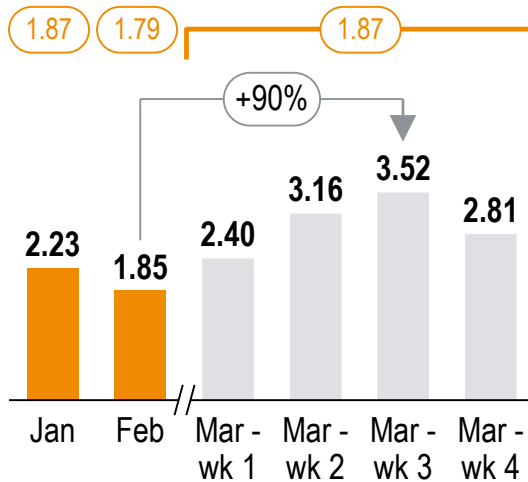


1) Excludes fuel surcharges

Inventory replenishment after the initial panic buying phase gave truckload demand and freight rates a short-term boost

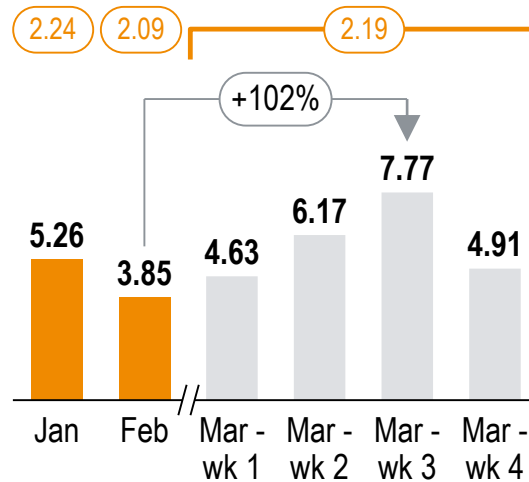
Impact of 'initial replenishment' on freight demand

Van load-to-truck ratio



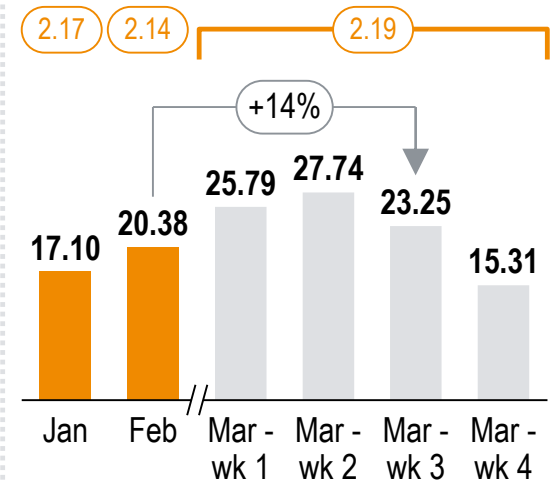
- > Replenishment shipments to warehouses drove a 90% increase in demand for vans in the third week of March (compared to the Feb. average)
- > Volume decrease already visible in last week of March

Reefer load-to-truck ratio



- > Panic buying at grocery stores drove demand for reefer shipments up ~100% in the third week of March (compared to the Feb. average)
- > Volume decrease already visible in last week of March

Flatbed load-to-truck ratio




- > Shipments to industrial companies did not experience the same replenishment boost as did shipments to warehouses and grocery stores
- > Demand for flatbed shipments rose only slightly in March and has since fallen below the Jan. and Feb averages

x.xx Monthly average spot price [USD/mile] excl. fuel surcharge

However, since mid-March, trucking activity has fallen significantly across the US – Impact has varied by region

Impact of COVID-19 on freight activity (post-initial replenishment)

Region 	Change in freight activity [% change from prev. 6 week avg.]												
	03-16	03-17	03-18	03-19	03-20	03-21	03-22	03-23	03-24	03-25	03-26	03-27	
Northwest + AK	101	97	94	92	91	91	88	89	85	81	79	78	
New England	95	87	87	86	84	84	84	79	73	72	75	72	
NY/NJ	83	76	75	73	72	80	81	62	62	60	61	61	
Mid-Atlantic	95	90	87	85	81	86	84	73	74	70	72	71	
South	99	95	95	94	93	90	88	86	84	85	86	84	
Midwest	97	93	91	88	87	88	84	84	79	78	77	74	
Southwest	97	95	94	92	89	87	89	91	88	87	86	84	
Central	100	99	93	91	90	98	93	93	87	88	89	83	
Rocky Mountain	100	97	88	80	82	89	88	91	89	86	84	82	
West	100	95	90	88	88	89	87	87	84	81	81	81	

The Northeast has seen the sharpest drop in freight activity

Relative to the rest of the country, cities and states in the Northeast have imposed strict shelter-in-place restrictions, which has dampened economic activity

New York and New Jersey have been hit particularly hard due to reduced port activity

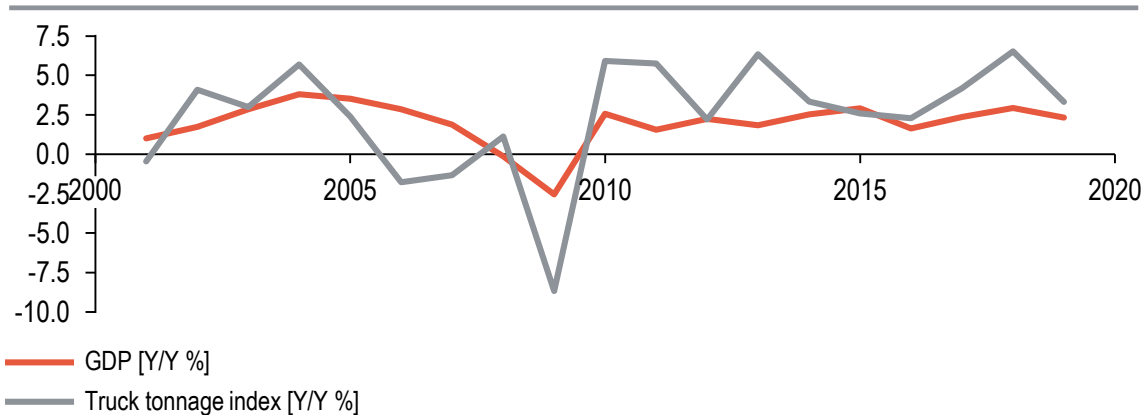
Port activity in New York and New Jersey is expected to decline ~30% in March compared to the same month last year

1) Using the period Feb 1st through March 15th as a baseline

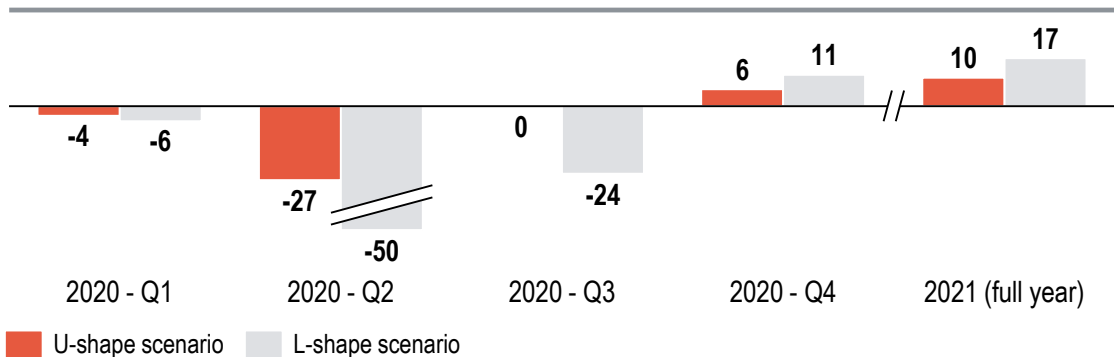
Truck tonnage will see a sharp decline in coming months driven by sharp contraction in GDP and particularly industrial production

GDP as a key driver of trucking demand

Historically, GDP has been a strong driver for truck tonnage



GDP growth under two potential COVID-19 impact scenarios [Y/Y %]

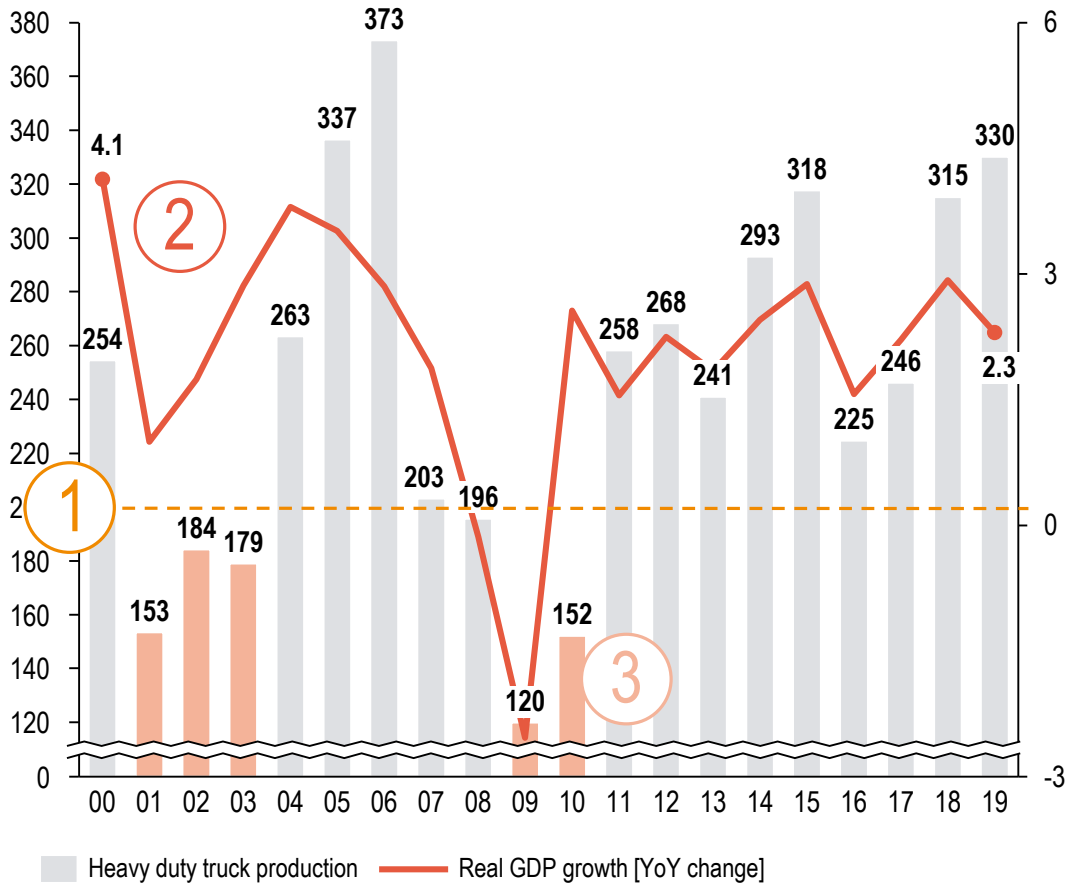


Individual trucking segments will see different levels of impact

- > Demand for food delivery will remain strong, although the nature and location of consumption will change dramatically
 - We will see an increase in deliveries to grocery stores and other large food retailers (e.g., Target) and a decrease in deliveries to restaurants
- > A surge in online shopping will support shipments to and from warehouses, while shipments to retail stores will be reduced
- > A slowdown in the industrial/manufacturing sector will hurt demand for flatbed loads
- > A decline in housing starts will lead to reduced demand from the construction sector

HDT production during past recessions dropped below the replacement demand as fleets started to "sweat" their assets

HDT¹⁾ production volume compared to GDP growth ['000 units, % change]



Fundamental market mechanism

- 1 There is a replacement level that typically serves as a production base**
 - > The current replacement level for North American heavy duty trucks is ~200 k units per year
 - > The replacement level is a function the number of active trucks²⁾ in the vehicle parc (~2.1 m) and the average replacement age of a truck

- 2 HDT production is correlated with GDP in growth periods**
 - > During times of GDP expansion, truck production scaled with real GDP growth as fleets add additional capacity to meet the additional freight demand

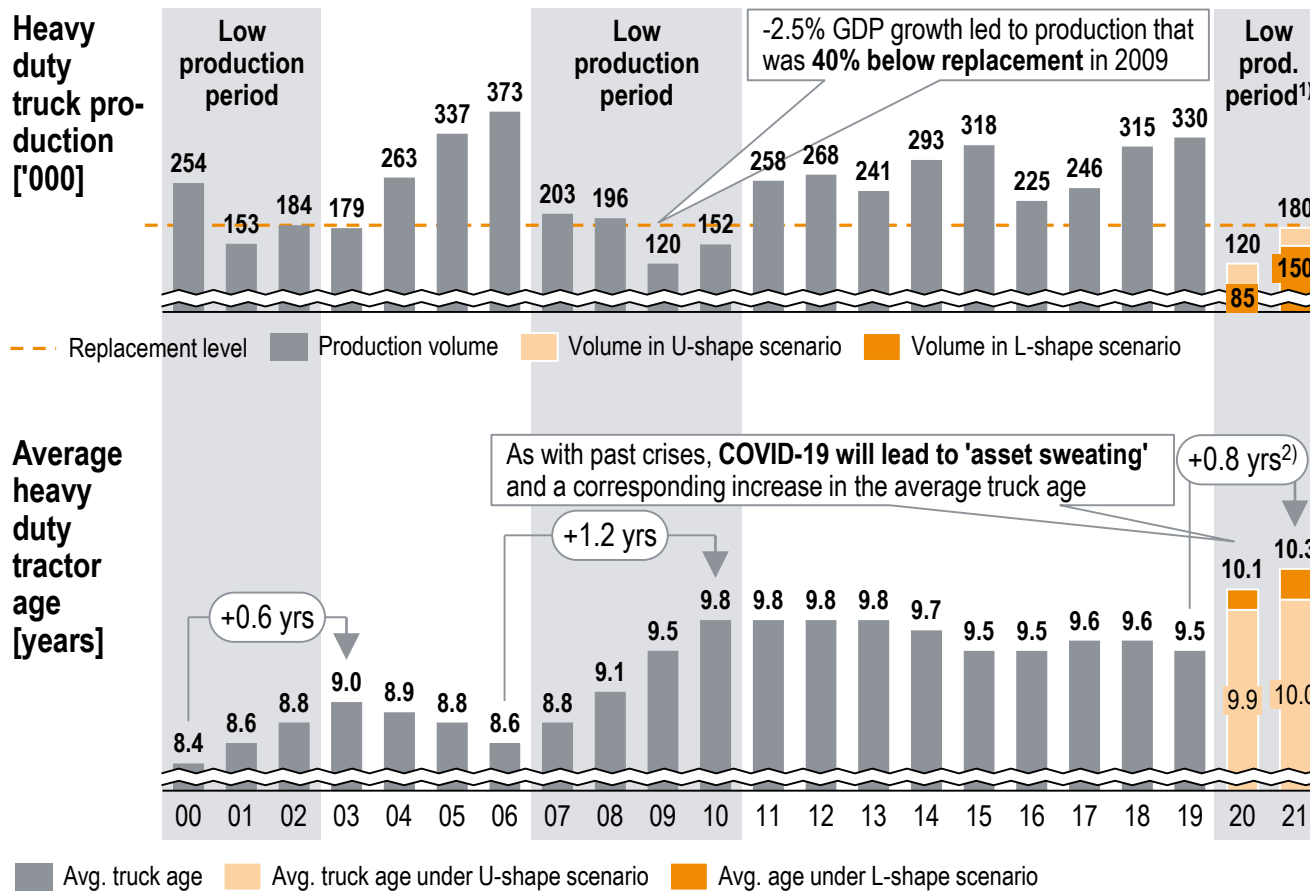
- 3 When GDP decline is sharp enough, HDT production falls below replacement level**
 - > During both the recession in the early 2000's and the financial crisis, HDT production fell below the replacement level
 - > Fleets will decide to continue using older trucks, rather than replacing them
 - > When GDP growth dips significantly below zero, replacement becomes the main driver of truck demand – Duration of recession is more impactful than depth of recession

1) Class 8 2) Active trucks are trucks that are used for regular freight transport



During the last crisis, fleets altered their asset retirement behavior, deciding to use trucks longer before buying new ones

"Asset sweating" during crisis years



Economic shocks have led to shifts in truck retirement behavior

- > During the last crisis, extended truck usage led to a decrease in replacement to 60% of the normal level
- > Advancements in truck quality have facilitated the increasing average truck age
- > Whether the avg. age will remain elevated or decline back to ~9.5 following the COVID-19 crisis will depend on OEMs' ability to incentivize replacement through technological advancement (e.g., fuel efficiency gains)

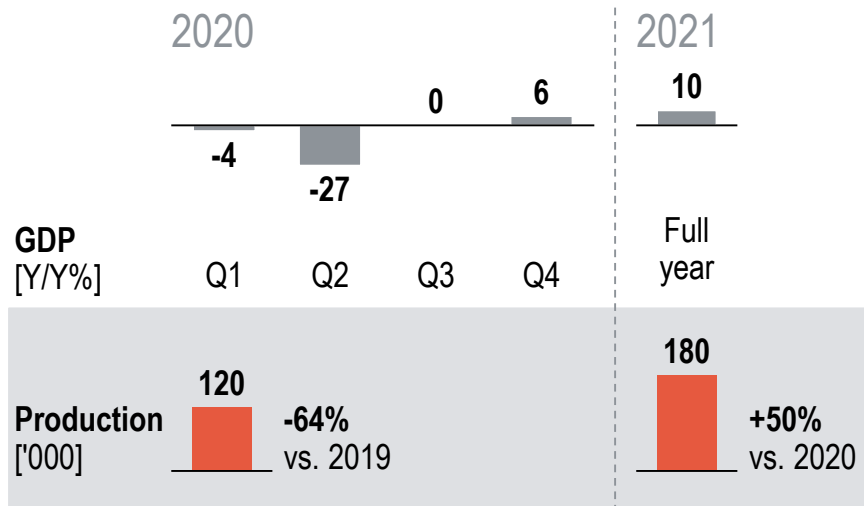
1) Based on forecasts; 2) Considers the age increase under the pessimistic case

We expect HDT production to drop to levels comparable to the last crisis – Even stronger decline possible in L-shape scenario

Heavy duty truck production scenarios for North America

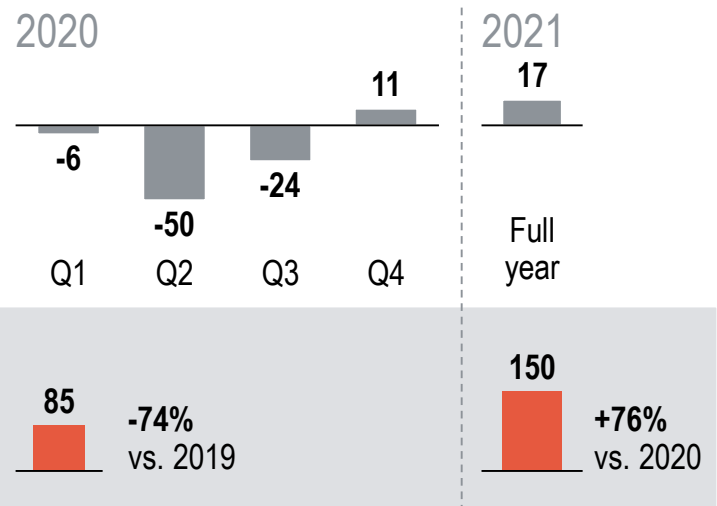
U-shape scenario

- > GDP is expected to contract by 27% in Q2, but will return to normal levels by Q3
- > Truck carriers delay new heavy duty truck orders by ~5 months through "sweating" of existing assets in 2020 leading to production 40% below replacement¹⁾
- > With GDP growing again in Q4 and through 2021, carriers start ordering near replacement levels again in 2021

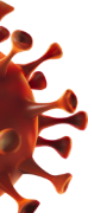


L-shape scenario

- > GDP expected to contract by 50% in Q2 and by 24% in Q3
- > Truck carriers delay new heavy duty truck orders by ~7 months leading to production ~60% below replacement
- > With the economy taking longer to recover, carriers continue to 'sweat assets' in 2021 – Volume remain below replacement level



1) Replacement level for HDT ~200 k

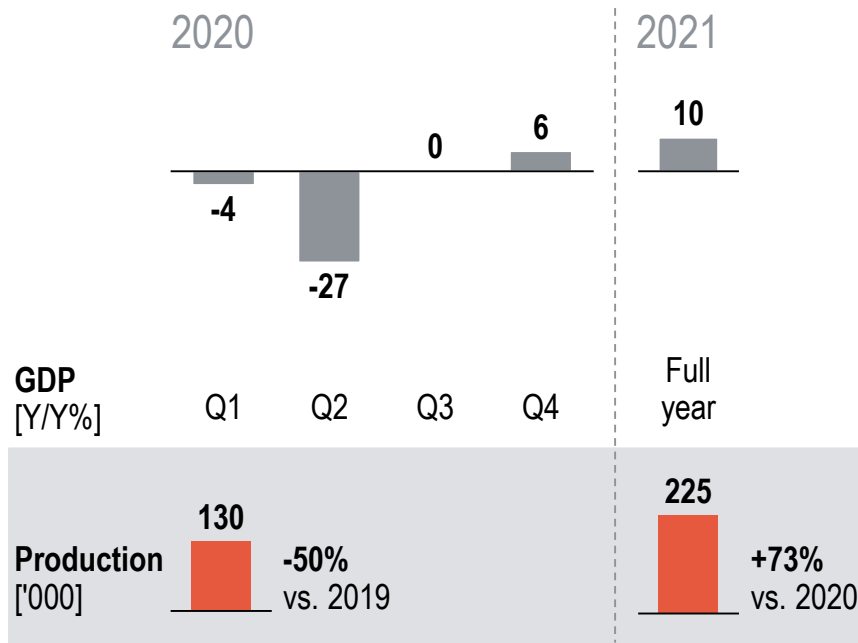


MDT production will also be negatively impacted, although the reduction will be slightly less severe than in the HDT segment

Medium duty truck production scenarios for North America

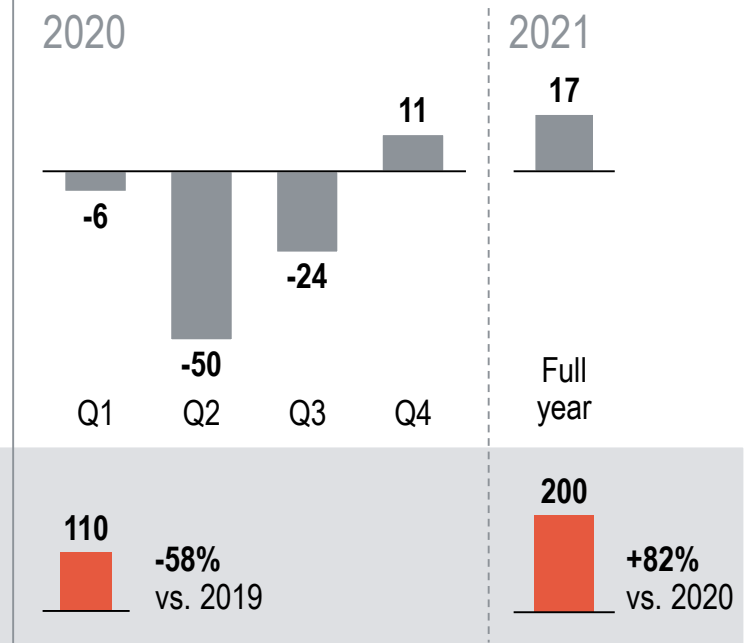
U-shape scenario

Decline in medium duty truck production less severe than in the HDT segment as some end-markets will see less demand decline



L-shape scenario

Medium duty truck production will see stronger impact as end-markets are more severely impacted



B. COVID-19 impact on Off-highway Equipment



We will look at COVID-19's impact on the North American Off-highway market by focusing on three main segments

Focus segments and North American market sizes [units; 2019]

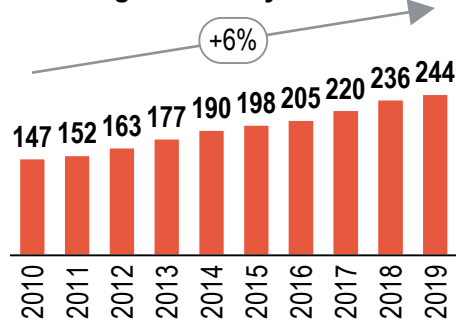


With the exception of Large Ag machinery, all segments experienced strong growth over the past decade

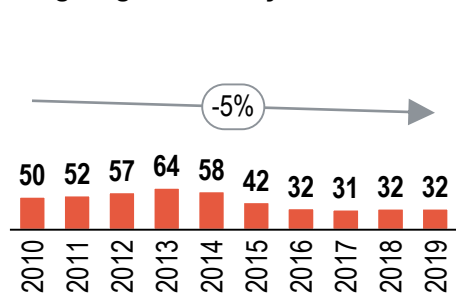
Pre-crisis sales by segment ['000 units]

1 Agriculture machinery

Small Ag machinery

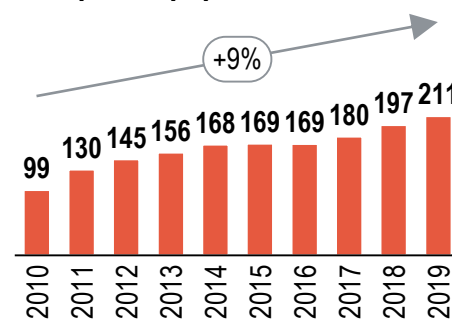


Large Ag machinery

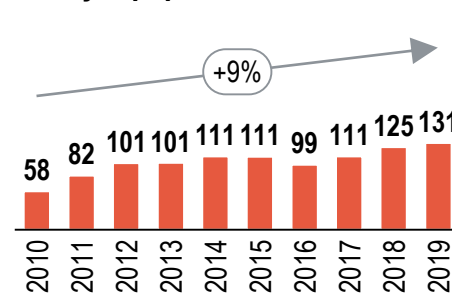


2 Construction equipment

Compact equipment

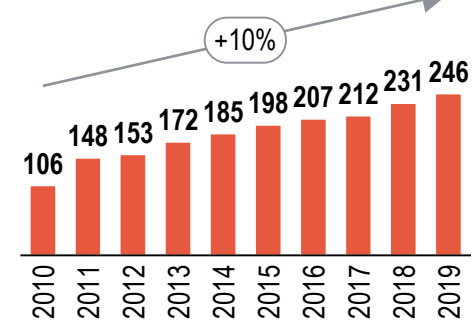


Heavy equipment

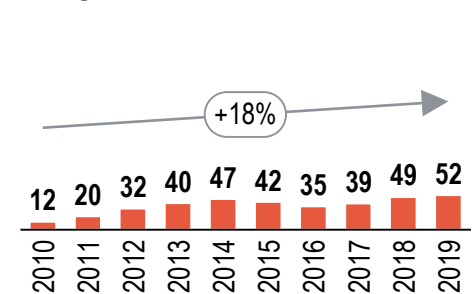


3 Material handling

Warehouse lift trucks

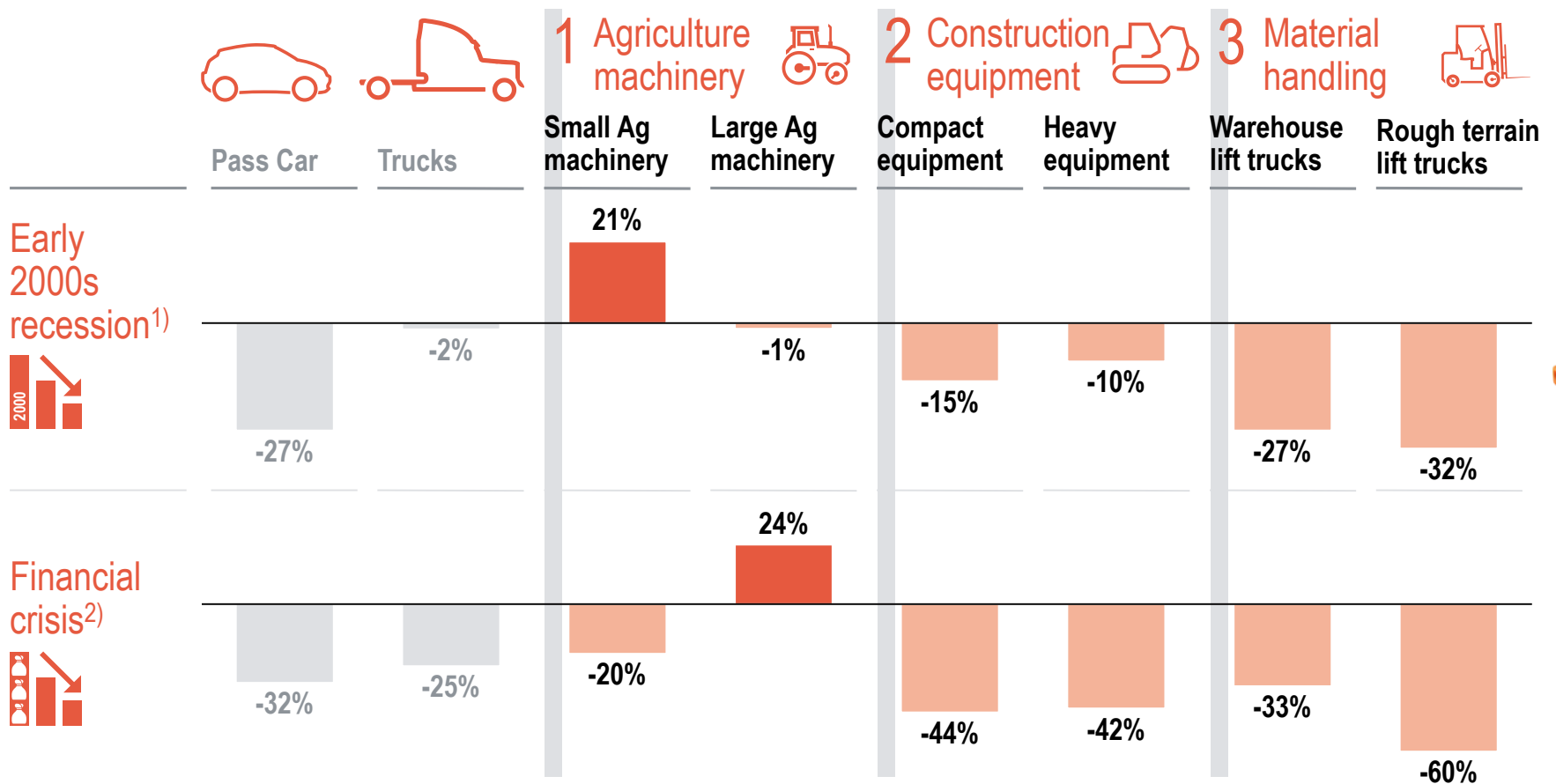


Rough terrain lift trucks



During past crisis, the individual off-highway segments have been impacted differently, requiring a segment-specific driver analysis

Impact of past crisis on sales volumes












1) Average sales 2001-2003 versus 2000 2) Average sales 2008-2010 versus 2007

Annual sales in each segment are correlated with various drivers

– We assign a key driver to each for forecasting purposes

Key drivers for equipment purchases

	Segment	Key driver
1 Agriculture machinery 	 Small Ag machinery	Real GDP
	 Large Ag machinery	Gross farm income
2 Construction equipment 	 Compact equipment	Housing starts
	 Heavy equipment	Residential construction
3 Material handling 	 Warehouse lift trucks	Industrial production
	 Rough terrain lift trucks	Industrial production

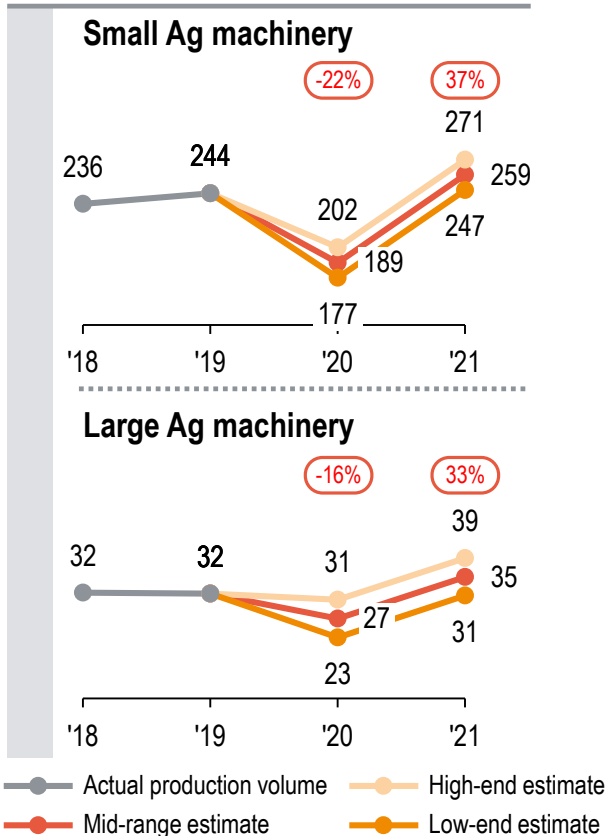
- > We identified relevant drivers and determined which ones had the highest correlation with historical sales volumes for each segment
- > Behind each driver there is often a set of sub-drivers (e.g., Gross farm income is driven by production volume and crop & livestock prices)
- > Understanding how the drivers and sub-drivers will likely develop during the crisis helps predict volume impacts in our focus segments



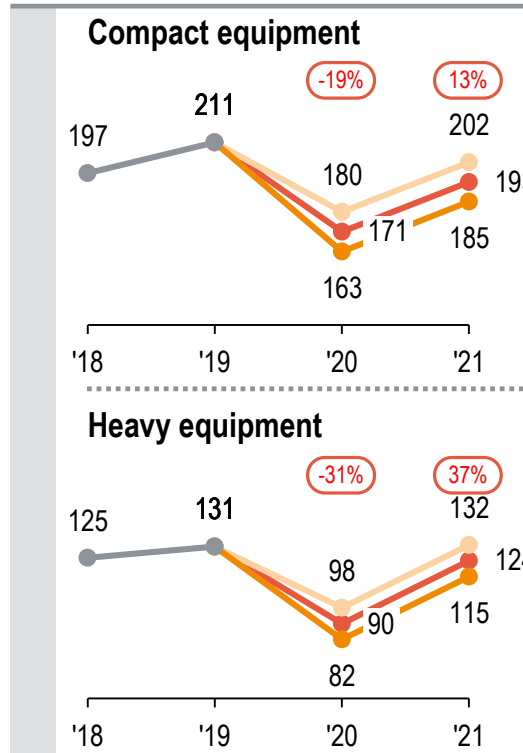
Sales of Ag and Construction equipment are projected to drop by ~15-30% in 2020 – Lift trucks to decline more sharply

North American sales by segment ['000 units]

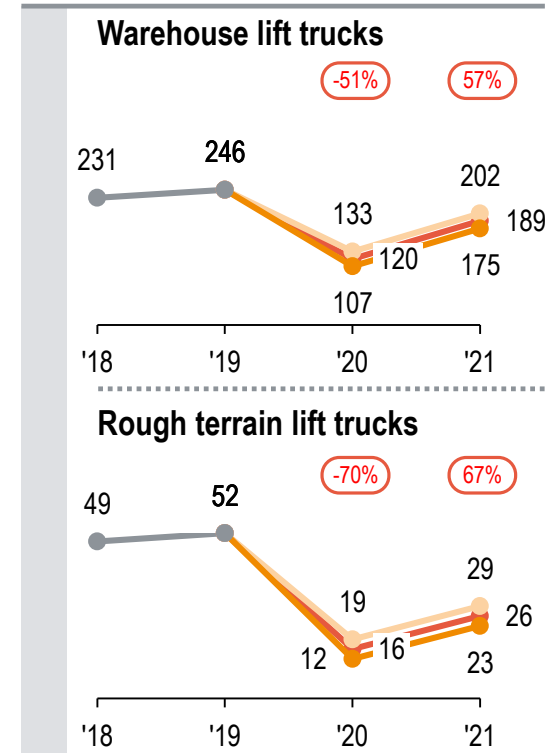
1 Agriculture machinery



2 Construction equipment



3 Material handling



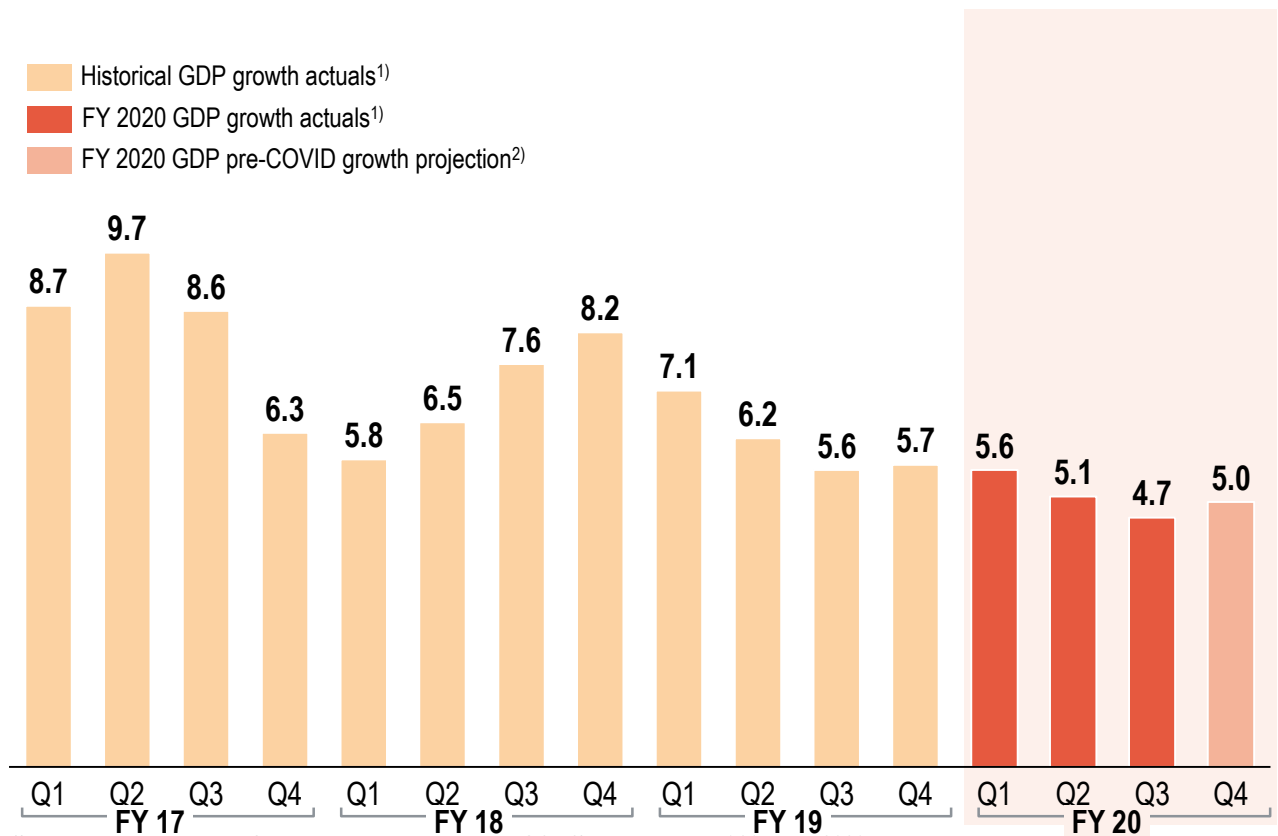
x% Annual % change in sales volume for mid-range estimate

C. COVID-19 impact on India



FY 2020 was a tough year for Indian economy as NPA crisis and weak domestic consumption slowed down growth to a 6 year low

India Real GDP [YoY, %]



Factors behind slowdown in India

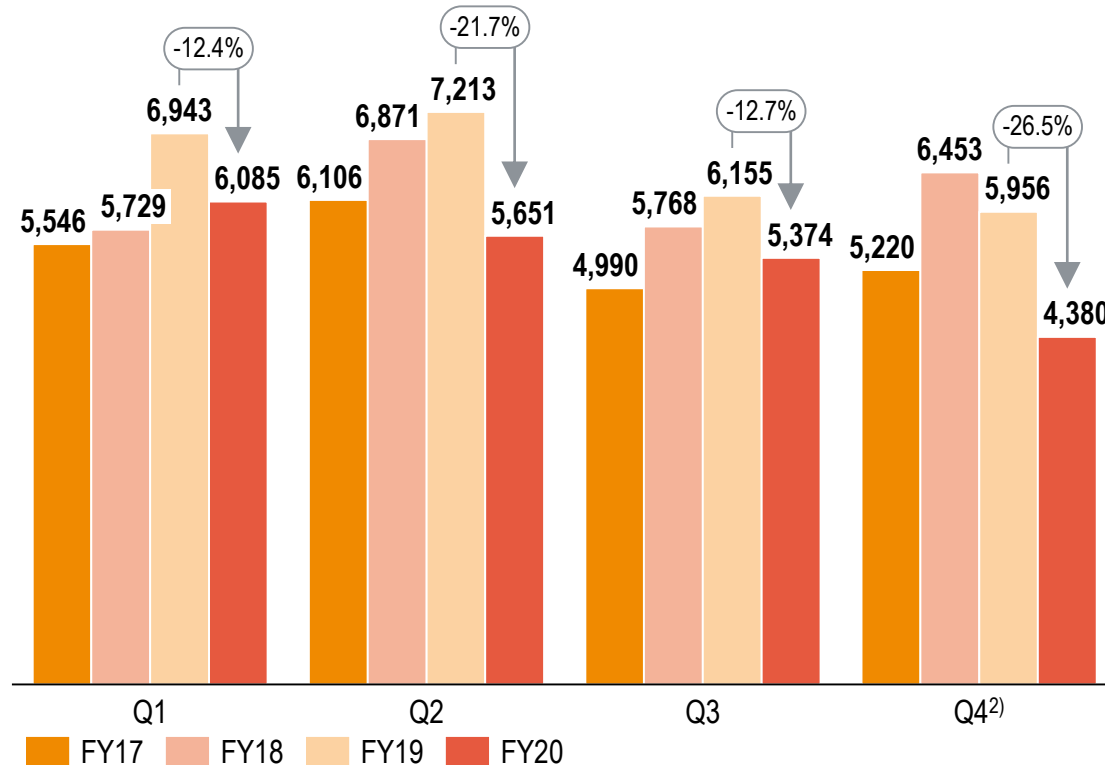
- > **Commercial credit slowdown** – collapse in shadow banking lending and NPAs in banks and NBFCs put Indian financial sector in doldrums
- > **Weak domestic demand** – contraction in all major industries
- > **Volatile fuel prices and economic sentiment** -- led to contraction in automotive
- > **Global factors** – Slowdown in Chinese growth in 2018/19 and ongoing trade war between US/China

1) Based on latest revised GDP actuals published by the GOI; 2) Projection as of 20th Jan 2020

We saw historical level of contraction in auto sector demand in FY 2020 - ~18% drop in overall automotive sales expected

Automotive market development, Q1 FY17 – Q4 FY20

Overall¹⁾ automotive sales in India, Q1 FY17 – Q4 FY20 ['000 units]



Key points

Annual sales figures estimated to **drop by 18% YoY** from FY19

- > Q4 sales declined by ~22% for PVs, ~43% for CVs and ~26% for 2Ws & 3Ws

Key factors for reduction in FY20 sales include:

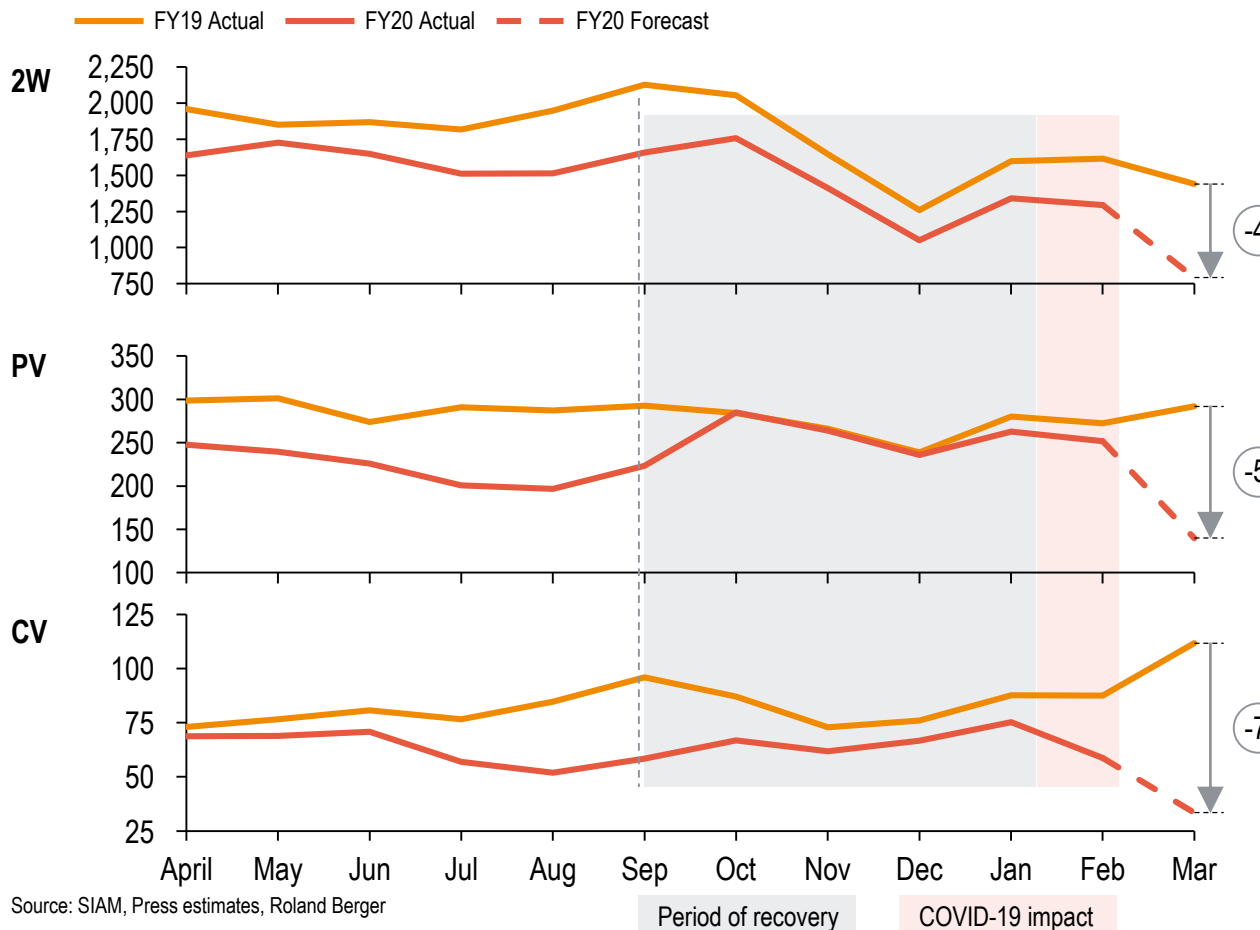
- > **Weak consumer sentiments** – both private consumption and gross savings as a % of GDP have decreased substantially
- > **Volatile rural demand** due to lack of credit availability and regulatory uncertainties has led to a slump in FY20
- > **Credit shortage from NBFC crisis and hike in insurance cost**
- > Slowdown in urban areas due to **infra constraints**
- > **Revised axle norms and GST implementation** has impacted CV sales
- > **BSVI implementation** leading to postponement of purchases to FY21
- > **COVID-19** had a severe impact on Q4 sales of FY20

1) Includes PVs, CVs, 3Ws and 2Ws; excludes Quadricycles 2) Actuals for Jan & Feb 2020; News reports used to estimate numbers for for March 2020

Source: SIAM database, Secondary research; Roland Berger

H2 of FY '20 was showing signs of recovery as monthly sales picked up; COVID-19 pushed March sales to historical worst

Monthly vehicle sales [units k]



> The **gap in monthly sales narrowed from October to December** across segments; in PV monthly sales reached 2019 levels. Main reasons include:

- Increased sales from festive season and good monsoon
- Hefty discounts
- Introduction of new models and fast growth in SUV segment

> March sales expected to fall ~50% YoY on COVID-19 concerns and **complete production shutdown** since March 21st

The auto sector severely exposed to supply side effects – BSIV inventory, deferred payments to suppliers major concerns

Supply side impact

Exposure to supply effects



Overall risk



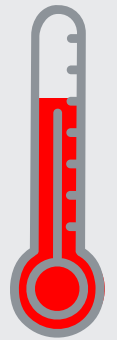
- > **Estimated losses of ~ USD 2 bn in March 2020** alone corresponding to lost sales of ~750k units due to lockdown amidst COVID 19 crisis
 - **Daily revenue loss due to shutdown is estimated at ~USD 300 m**
- > **BSIV inventory¹⁾ worth over USD 800 m lies unsold** with dealers
 - As of now, Supreme court of India has allowed nationwide sales (except Delhi NCR) of only 10%²⁾ of the BSIV inventory in first 10 days after deconfinement
- > **'Force Majeure' invoked by OEMS like Hero MotoCorp, VECV, Royal Enfield, on a case to case basis, to defer payments to suppliers** can create a cash crunch for supplier leading to short/mid term supply/labor reduction
 - Other OEMs may tread this path in case of an extended lockdown
- > Staggered approach to deconfinement is expected across states which will pose logistical constraints for suppliers



"In March 2020, the auto industry and the entire global economy has been faced with an unprecedented disruption, owing to the novel coronavirus. The COVID-19 has resulted in interrupted supply chains, halted production and lock-down, leading to no retails" – Hero MotoCorp

"Total imports are small, but the point is that for a car, even if one component is not there, I can't put the car on the road" – Maruti Suzuki

"As is known, the last financial year was the most challenging for the automotive industry because of economic slowdown, poor consumer sentiment clubbed with transition challenges to BSVI" – Honda Cars



1) 700,000 2Ws, 15,000 PVs and 12,000 CVs as of 27th March 2020 2) Uncertainty looms over the remaining 90% of the BSIV inventory

Source: Secondary research, Roland Berger

OEMs & suppliers announced suspension of services in the last week of March owing to a nationwide lockdown due to COVID-19

Production shutdowns by OEMs

"Maruti Suzuki has announced that it is temporarily shutting operations at its production facilities in Haryana – Gurugram and Manesar " – 22nd March

"Minda Industries temporarily shut down their operations in Northern India, Rajasthan and Maharashtra w.e.f from March 23rd until 31st March 2020"

"Hyundai Motor India has announced the suspension of production at its Chennai plant with effect from March 23, 2020 till further notice"

"Bosch announces closure of its 6 plants in India with effect from March 23, 2020"

"VE Commercial Vehicle (VECV) on Monday announced that it will be shutting plants at Pithampur, Baggad, Bhopal and Thane as a precautionary measure against coronavirus outbreak with immediate effect" – 24th March

"Tata Motors has announced that it is rapidly scaling down activities at its Pune facility to skeletal operations by the end of Monday, 23rd March"

"Hero MotoCorp has announced that it is suspending production at all its facilities across the globe and at its Global Parts Centre in Rajasthan with immediate effect, till March 31, 2020" – 22nd March

"Mahindra and Mahindra has announced the temporary suspension of manufacturing operations at its Nagpur, Chakan and Kandivali plants till March 31, 2020" - 22nd March

"Bharat Forge suspended operations of all their offices and manufacturing facilities in India from March 23rd"

"TVS Motor Company has decided to halt all manufacturing operations at its plants in India and Indonesia till further notice" – 23rd March

Weak income growth, consumer sentiments & credit slowdown expected to drag down demand as lockdowns would be lifted

Demand side impact

Exposure to demand effects



- > Low disposable incomes due to layoffs/pay cuts amidst COVID 19 crisis can play a critical role towards low demand in the FY21
- > Economic downturn and the liquidity crunch created by the banking crisis will continue to severely impact the demand in the automotive sector, especially the PVs
 - COVID 19's impact on the banking sector is likely to make it difficult to secure credit in the future and thus will drive down demand
- > Lockdowns due to COVID 19 and increased prices of vehicles due to BSVI implementation from April 2020 are likely to reduce the demand further in FY21
- > The macro-economic impact from the COVID-19 crisis may limit the extent of recovery and hamper the sales in FY21
 - Extent will however vary depending on how long it takes to find cure and stabilize economy

136 million jobs at risk in post-corona India

9 min read . Updated: 31 Mar 2020, 11:33 AM IST
Goutam Das

- There will be a tsunami of job losses for employees who don't have a regular salary, people without a written contract
- A labour market crunch right now can easily turn into a nightmare. Besides the possibility of social unrest, expect more demands for more reservations in government

Coronavirus threatens India's banking recovery before it even starts

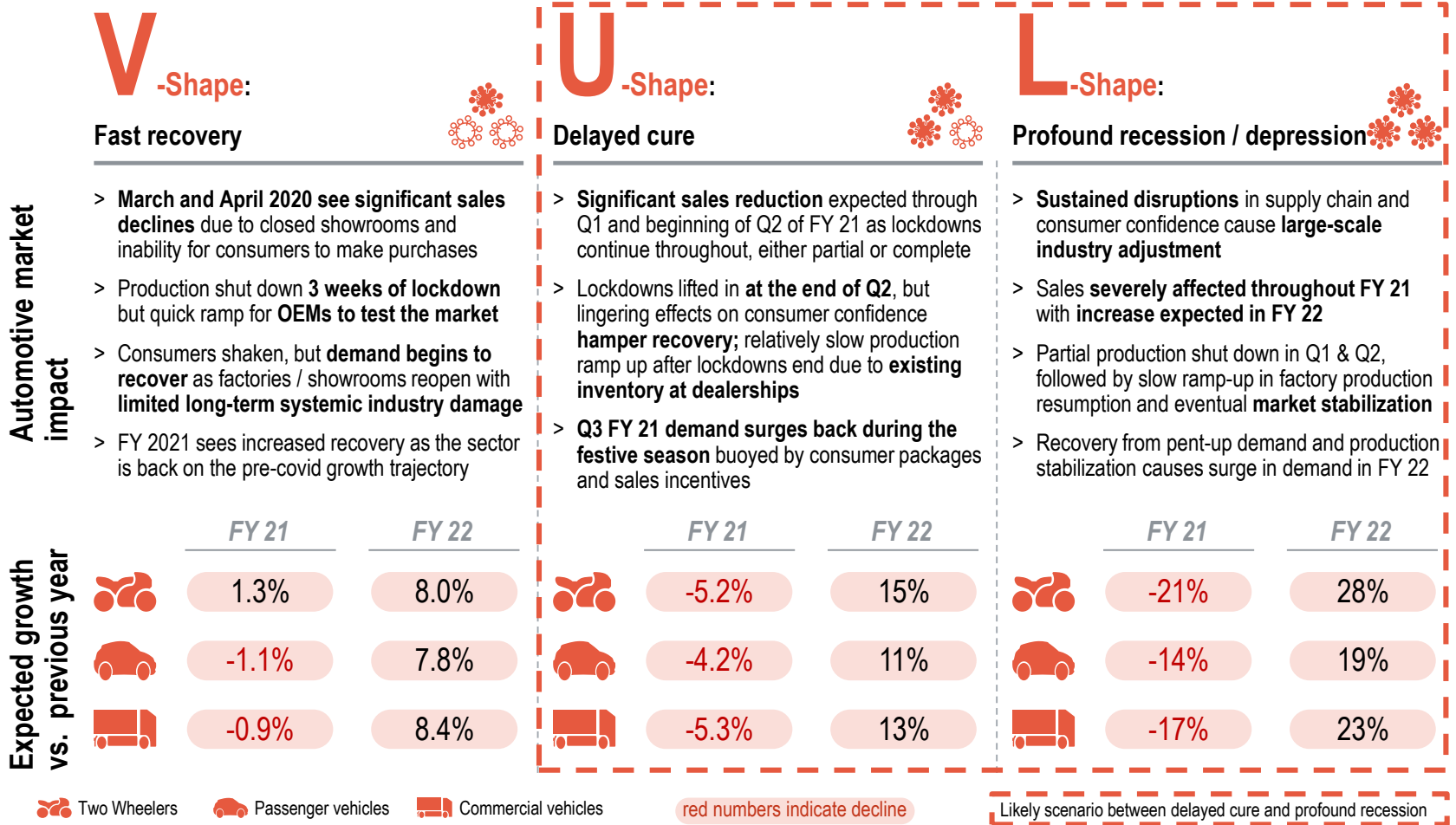
Work to reduce bad corporate loans at risk of setback as fears grow for consumers

- India Ratings has revised downwards its outlook on the sector to negative for 2020-21 from stable, as it expects 'flat-to-low pick up in volume in FY21'
- Limited credit availability and increased cost of ownership after BS-VI implementation from April will add to the already negative consumer sentiment, says the report

Overall risk



Automotive FY21 sales likely to reduce by 5% to 20% under key scenarios; recovery expected in FY 22



Source: Roland Berger

D. How to tackle the crisis



There are six key priority areas for automotive executives and most already need to be addressed at this point in the crisis

Priorities

- 1 Ensure **health** of staff & identify **vulnerabilities**

- 2 **Ramp down** or **shut down** operations

- 3 Deploy **short term liquidity measures**

- 4 Secure **funding** and **government aid**

- 5 Prepare **efficient re-start** after crisis

- 6 **Emerge stronger** by improving performance and capitalizing on strategic opportunities

-  Establish a **crisis response center** to monitor and coordinate across all priority areas

Timeframe



Now

Now

Now

April/
May

May+

Now

Depending on
financial position

Depending on
scenario

Our service offerings

1 *360° Check-Up*

2 *Effective Hibernation*


3 *Cash Office*

4 *Government Support*

5 *Effective Ramp-Up*

6 *Momentum Boost*

 *Control Room*

 Action already taken by most companies

This ramp-up after the COVID-19 shutdowns will be different than anything else the industry has seen

Differences of COVID-19 ramp-up vs. normal ramp-up after holiday or strike

Uncertainty When to restart operations | Change in **customer volumes** | Program **prioritization**

Unplanned Shutdown **not prepared** ahead of time | **Low inventory** build up

New operating state **Safety and health regulations** require new shift models and social **distancing**

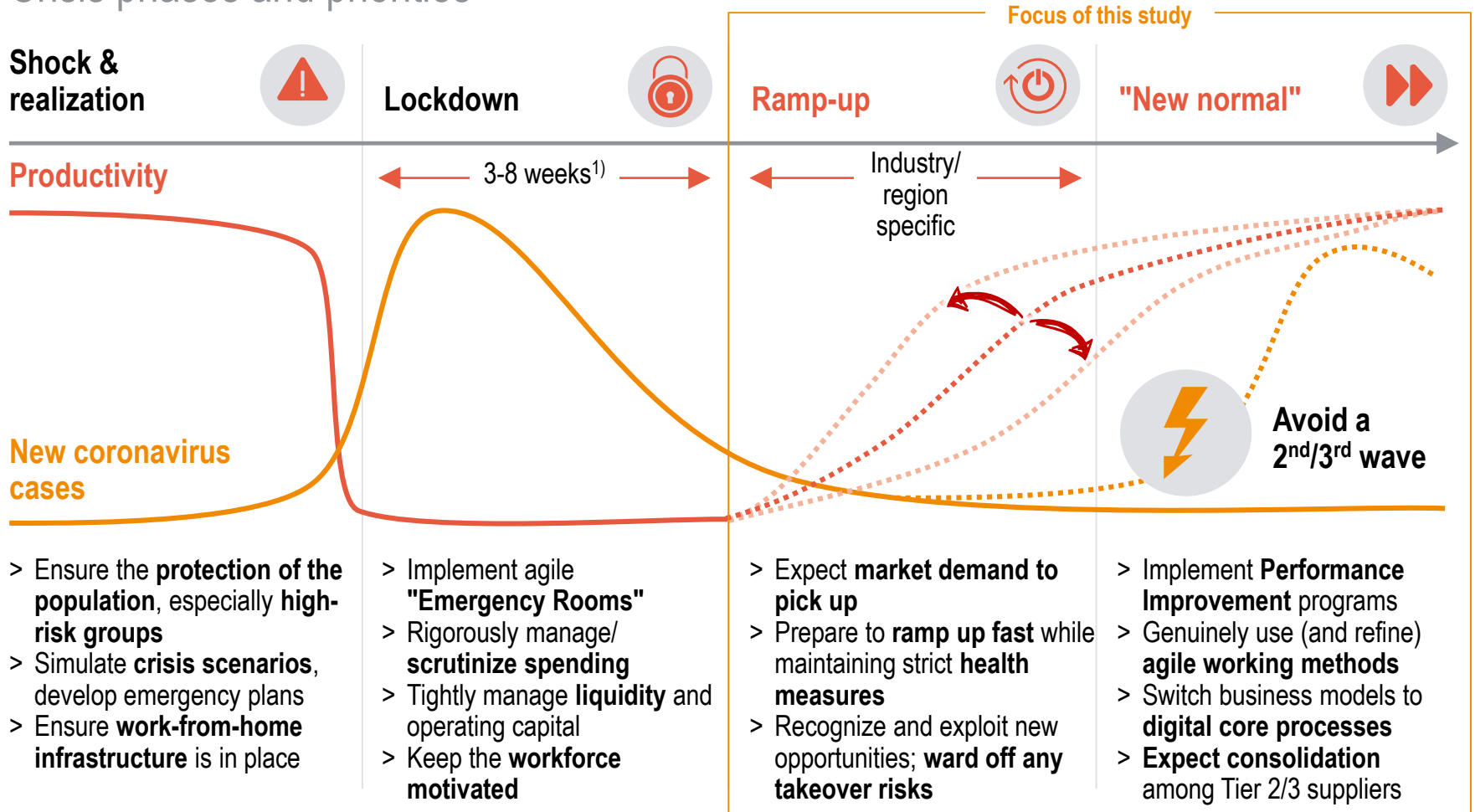
Complete hibernation **Full plant shutdown** | No **maintenance support** or facilities care

Supply base uncertainty Supplier **readiness** | Supplier **insolvencies** | Supply chain **synchronization**

Long timeframe **6+ weeks** of no production

After ensuring employee health and implementing strict cost measures, it's now time to prepare for ramp-up and a "new normal"

Crisis phases and priorities



1) Duration dependent on regional ordinances

OEM ramp-up plans will differ depending on program priorities and sequencing strategy

OEM ramp up planning – Influencing factors for OEMs

Criteria for OEM prioritization

- > **Program profitability** – start with highest margin programs
- > **Vehicle volumes** – start with high volume programs
- > **Dealer inventory levels** – deprioritize models with high dealer inventories (slow movers)
- > **Demand projection** – Prioritize models whose demand is projected to increase (new models)
- > **Supplier readiness** – Hold off launching models with portions of supply chain not yet ready
- > **Complexity** – Deprioritize models with high technical complexity
- > **Common production assets** – Prioritize programs with shared platforms

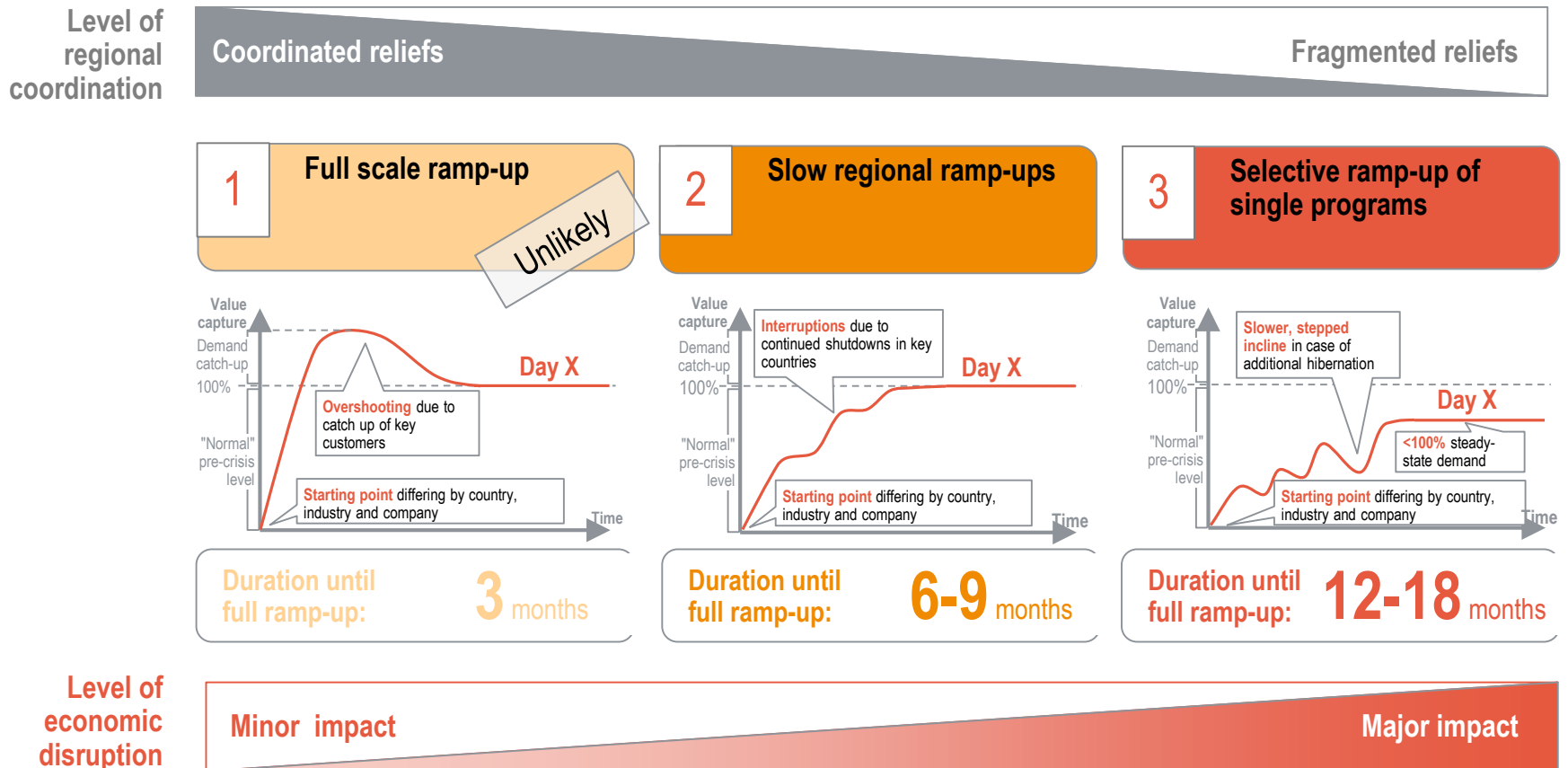
Potential cadence of restart

- > **Region by region** – geographic regions startup at the same time
- > **Shift by shift** – first shift brought online initially across all lines
- > **Plant by plant** – plants are brought back online, one at a time
- > **Program by program** – individual programs are restarted as they become ready

Each OEM will decide independently on best sequence and timing: Full scale vs. regional vs. slower selective ramp-up

























The overall ramp-up process will depend on a coordinated lift of the economic lockdown across regions

Ramp-up scenarios and duration to pre-COVID-19 levels



OEMs and suppliers therefore need a strategic plan for ramp-up, including scenarios and risk mitigation plans

Impact by corporate and plant function

Function / Value chain step	Importance to scenarios			Key issues	Resource need	Recommended actions
	S-1	S-2	S-3			
Production / HR				<ul style="list-style-type: none"> > COVID-19 free working environment > Organization of production process 		<ul style="list-style-type: none"> > Implement safety and health protocols > Adjust production to COVID-19 driven requirements
Procurement				<ul style="list-style-type: none"> > Supplier readiness > Short term need for alternate suppliers 		<ul style="list-style-type: none"> > Elaborate stable supplier sourcing plan > Support "at risk" single sourcing suppliers
Engineering				<ul style="list-style-type: none"> > Too little social distance in line layouts > Insecure volume planning base 		<ul style="list-style-type: none"> > Rebalance lines for lower volumes and increased social distancing
Logistics				<ul style="list-style-type: none"> > Synchronization of fragile SC > Shortages of "at-risk" components 		<ul style="list-style-type: none"> > Intensify communication with supplier > Develop concepts mitigating material shortages
Maintenance				<ul style="list-style-type: none"> > Equipment inoperable on start-up > Legal equipment certification expired 		<ul style="list-style-type: none"> > Plan maintenance to get equipment technically and legally ready prior to start of ramp-up
Finance				<ul style="list-style-type: none"> > Liquidity shortage > Adaption of fixed-cost base 		<ul style="list-style-type: none"> > Establishing of cash office > Cost monitoring during ramp-up

 Low  Medium  High

A more detailed ramp-up checklist and playbook is available upon request

Roland Berger COVID-19 ramp-up checklist

» Roland Berger developed an extensive menu of actions plants can take to address the COVID-19 crisis

» Approximately 200 actions sorted by function and value chain step

» Individual actions range in priority from A – Imperative to perform prior to Day X, to C – Optional after Day X

COVID-19 ramp-up checklist

Level	Value chain step	Category	Action	
Plant	Production	Backup planning	Establish comprehensive scenario planning and corresponding shift models to be prepared for	
Plant	Production	Backup planning	Secure spare parts availability for critical components, especially if cycle times are reduced	
Plant	Production	Backup planning	Prepare temporary labor pools to cope with higher absenteeism and short-term >100% contracts	
Plant	Production	Backup planning	Organize/Prepare for potentially required exception permits, e.g. longer working times, productivity	
Plant	Production	Capacity / Resources	Adapt working schedules of blue collar workers to capacity planning/new customer orders	
Plant	Production	Capacity / Resources	Manage short-time working allowances in line with regulations and according to capacity	
Plant	Production	Capacity / Resources	Prioritize available production capacity in a joint effort with customers	
Plant	Production	Capacity / Resources	Adjust shift models and working times in short-term regularly in accordance with the ramp-up	
Plant	Production	Capacity / Resources	Close monitoring of scrap and tracking of scrapped parts to avoid material shortages because	
Plant	Production	Capacity / Resources	Clarify potential delays of ramp-up projects with clients	
Plant	Production	Capacity / Resources	Secure readiness of operationally relevant tooling before ramp-up (e.g. make sure that required maintenance cycles have been conducted during lockdown)	A
Plant	Production	Capacity / Resources	Secure availability of workforce in adjacent areas, e.g. tooling, maintenance, other relevant services for production	A
Plant	Production	Capacity / Resources	Classify essential personal to run all critical processes	A
Plant	Production	Capacity / Resources	Classify essential key spare parts to run all critical processes	A
Plant	Production	Capacity / Resources	Leverage specialized teams and experts across plants via video-conferencing, e.g. remote troubleshooting by electrician of another plant	A
Plant	Production	Capacity / Resources	Rebalance lines for lower customer volumes	A
Plant	Production	Capacity / Resources	Ensure availability of critical assets and back-up lines	A
Plant	Production	Capacity / Resources	Execute (scheduled) maintenance on machinery before ramp-up and reduce maintenance intervals to avoid unnecessary downtimes in peak periods	A
Plant	Production	Capacity / Resources	Staff and incentivize additional maintenance resources for machinery ramp-up, quickly resolving issues from prolonged downtime	A
Plant	Production	Capacity / Resources	Identify urgent investments to maintain operability (e.g. required tools, additional equipment, etc.)	A
Plant	Production	Capacity / Resources	Consider implementing financial aid/special conditions (e.g. more flexible working hours) for employees in difficult circumstances	C
Plant	Production	Capacity / Resources	Consider incentive programs/hazard bonuses for workers	C
Plant	Production	Capacity / Resources	Close tracking of output to avoid performance related output problems	A
Plant	Production	Capacity / Resources	Ensure availability of sufficient employees	A
Plant	Production	Capacity / Resources	Check for workplaces where manufacturing processes interfere with infection-protection requirements (e.g. fine mechanics and gloves)	B
Plant	Production	Capacity / Resources	Check functionality of equipment closely before ramping-up production	B
Plant	Production	Capacity / Resources	Prepare start of equipment with long technical activation times (e.g. paint lines, chemical processes) for ramp-up	B
Plant	Production	Capacity / Resources	Intensify inbound material checks to avoid not parts in production	B
Plant	Production	Communication	Establish regular information exchange with local authorities to align in case of critical situations (e.g. COVID-19 outbreak) or measures to be taken to prevent infections	A
Plant	Production	Communication	Communicate with workers frequently about current situation, current measures in place, the necessity to comply with measures under any circumstances and ensure appropriate work climate	A
Plant	Production	Finance	Consider execution of a performance program to avoid costly inefficiencies and use low utilization for implementation of measures	B
Plant	Production	Logistics	Build up stock levels to be prepared for material shortage (e.g. suppliers bankruptcy) or if plant is forced to close upon positive COVID result	B
Plant	Production	Process	Prepare for short notice changes from clients	A

Production / HR

- Implement strict safety protection protocols
- Review shift schedule to allow before social-distancing
- Engage union leadership to address employee concerns

Engineering

- Redesign lines for new volume
- Redesign production layout to ensure social-distancing
- Install additional protection devices where workers in hot handles

Logistics

- Ensure sufficient inventory for ramp-up
- Intensify communication and sync with supplier
- Strengthen freight supply chain

Finance

- Estimate and plan for liquidity need for several ramp-up scenarios
- Implement and control for ramp-up critical KPIs
- Insource vendor work

Procurement

- Verify supplier readiness before ramp-up
- Identify "black" sourcing and develop alternative sources
- Re-assess overall supplier base

Maintenance

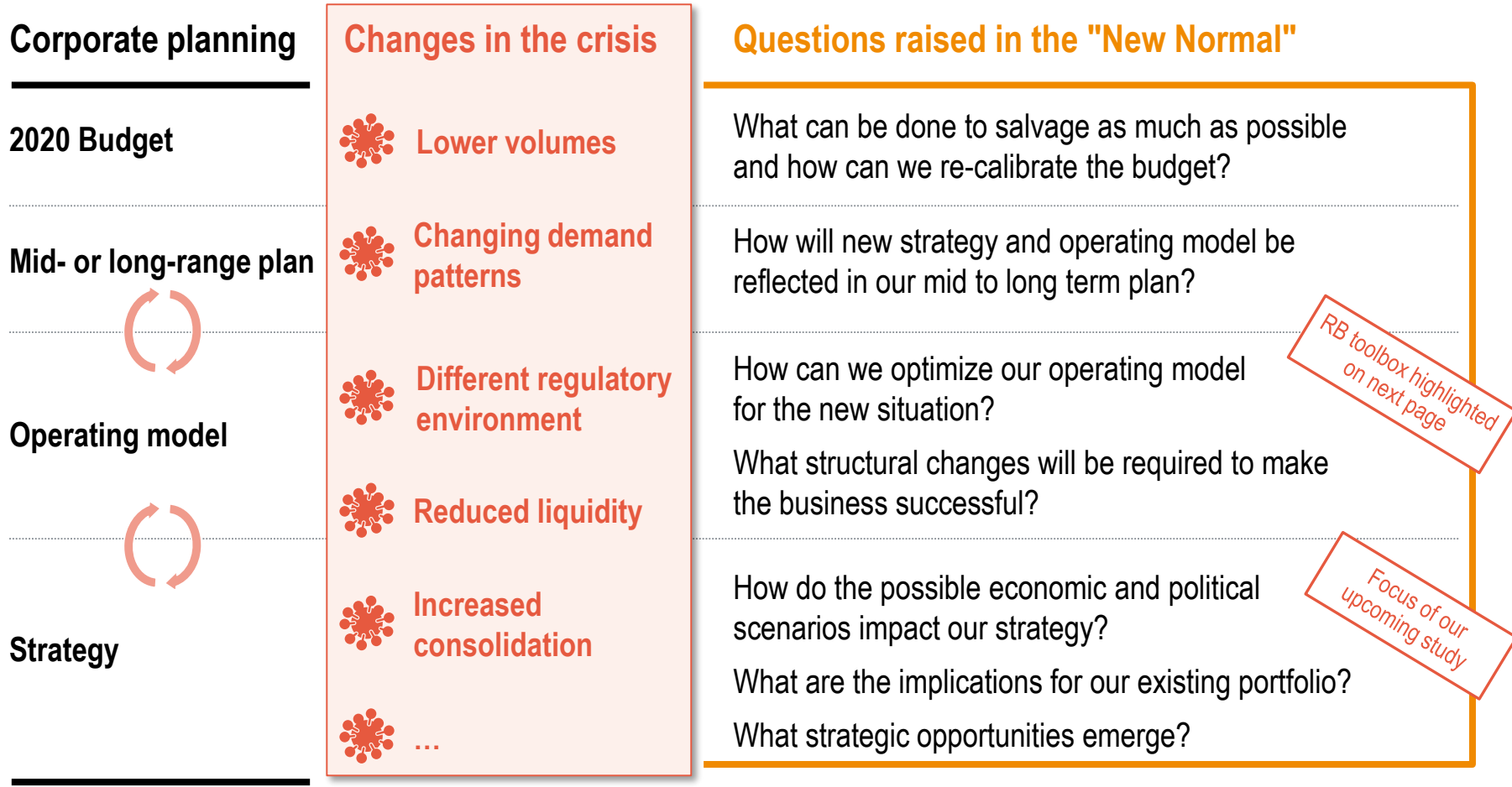
- Develop equipment start-up plan after fabrication
- Develop maintenance plan for maintenance base
- Identify critical spare parts and verify inventory levels

Long list of ramp-up actions available upon request!

Please send an email to COVID-19AutoIndustryUpdate@rolandberger.info with subject "Ramp-up checklist" or reach out to your Roland Berger contact to get in touch with us

The "New Normal" carries implications for 2020 budgets and requires a rethink of corporate operating models and strategies

Implications for corporate planning

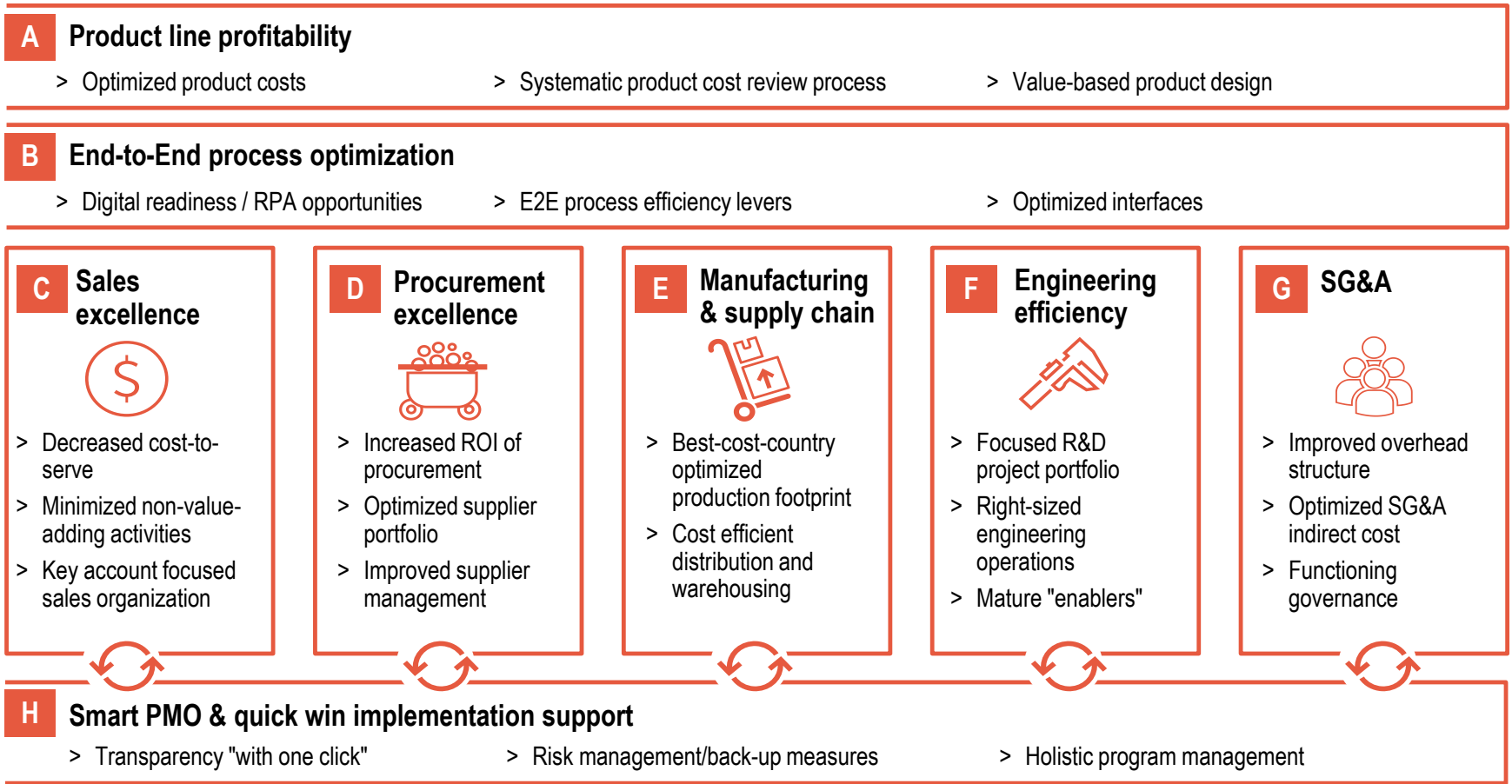


RB toolbox highlighted on next page

Focus of our upcoming study

Companies will have to adapt their operating cost to the "new normal" by reaching the next level of efficiency across all functions

Roland Berger performance improvement toolbox



Please don't hesitate to get in touch with us to discuss the implications for your business



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