



NY COVID-19 Preliminary Economic Impact Assessment

Estimating effects of COVID-19 on NY's Economic Output

APRIL 2020



LEGAL DISCLAIMER

The COVID-19 situation is rapidly evolving, on a daily basis. This document represents one scenario based on discrete data from one point in time. It is not intended as a prediction or forecast about duration of lockdown; peak of viral infections; efficacy of government or health care responses to the virus; or other health or societal impacts, and does not represent an “official BCG view.” It is also not does not constitute medical, legal or safety advice, and is not an endorsement or recommendation of a particular response. As such, you are advised to use this document as general guidance only in making your own continued assessments as to the appropriate course of action, taking into account local laws, rules, regulations and orders.



ANDREW M. CUOMO
Governor

ROBERT F. MUJICA JR.
Director of the Budget

April 2020

The following preliminary economic impact assessment was compiled by Boston Consulting Group (BCG) at the request of the State to inform our analysis of the worldwide COVID-19 pandemic on the New York State economy and State revenues. As we navigate an unprecedented public health crisis and ensuing economic downturn, it is paramount that we expand our expertise to include a wider variety of ideas and considerations.

As the State develops plans for re-opening the economy, balancing public health with the need to get New Yorkers back to work, this initial assessment will help us understand how those efforts will interplay with the State's finances.

The economy has been hit hard by policies which were necessary to save lives and stop the spread of the virus. The impacts effect every sector and every region of the State, and the road to recovery will last through State Fiscal Year 2021 and beyond SFY 2022.

Above all, it remains abundantly clear New York State cannot navigate this national crisis on its own and needs federal funding support. The modeling performed by BCG aligns with the State's revenue forecast, which projects a revenue shortfall of \$13.3 billion from the Executive Budget Forecast as a direct consequence of the pandemic.

The lost revenues would diminish the State's ability to provide services to New Yorkers at a time when they need them most. In jeopardy is funding for health care, hospitals, K-12 schools, first responders, higher education and infrastructure, as well as support for New York City, counties, towns, and villages, and the State's not-for-profit partners who deliver critical services to the State's most vulnerable populations. We are already taking the first steps to reduce spending impacting tens of thousands in the state workforce while planning for further actions. In the absence of federal aid, we will have no choice but to move forward with these devastating and unprecedented reductions.

New York is the financial capital of the world and represents 8% of total U.S. GDP. If New York State doesn't receive adequate levels of federal funding for the public and private sectors that is proportionate with the need and impact of the crisis, our economic recovery -- and the nation's -- will be weakened.

Under Governor Cuomo's leadership, the State will recover and build back better than before. New York has recovered and grown through the economic crises of the 1970s, the dot.com bust, the terrorist attacks of September 11, 2001, the 2008 Great Recession, and Hurricane Sandy. With the help of our governmental partners at the federal level, and the patience and fortitude of New Yorkers, our State will move forward and come back better than before.

Sincerely,

A handwritten signature in blue ink, appearing to read "R. F. Mujica Jr.", written in a cursive style.

Robert F. Mujica Jr.
Director of the Budget

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Executive summary (I/III)

The health of the NY economy is crucial to the health of the entire country

- NY is the financial capital of the world, represents 8% of US GDP, including 14% of the Education sector and 12% of the IT sector
- NYC is the #1 US destination for foreign travelers

NY State has been hit harder by COVID-19 than any other State, with almost three times more confirmed cases than the next hardest hit state (NJ)

- 31% of all US COVID-19 cases are in NY
- 37% of all US COVID-19 deaths are in NY

Nationwide social distancing policies have begun to reduce the rate of infections, hospitalizations, and deaths. However, they have also resulted in significant economic harm

- E.g., NY unemployment has risen by 2,104%; credit card sales have gone down by 20%
- Economic impacts translate into pressures on government revenue - NY forecasts that tax revenue could decline by \$13.3 billion in SFY 2021 compared to the Division of the Budget's February forecast, and \$61 billion for SFY's 2021-2024

To estimate the total harm to NY's economy, we analyzed the impact to date on NY industries, and potential rates of recovery

- Impact based on sources including unemployment claims and credit card sales, with additional analysis performed for key NY industries
- For modeling purposes the "Restart date" for the NY economy is currently assumed to be in early Q3 2020 - consistent with DOB's latest modeling assumptions - although for specific industries the start date could be sooner or later as public health data permits
- Shape of recovery for key industries informed by performance in past recessions
- Based on inputs above, we estimated total reduction in NY GDP, analyzing interaction effects between industries and regions

Executive summary (II/III)

This analysis suggests the total impact on NY's economy will be \$243B over the course of the full recovery relative to pre-Covid economic levels, which is equivalent to ~14% of NY's 2019 GDP

- Additionally, there is a \$202B loss relative to pre-Covid GDP growth trends, bringing the total loss to \$445B
- This impact is greater than 9/11 or the 2008 Great Recession which caused an economic impact equivalent to -2% and -10% of Real GDP respectively
- Based on this analysis, the economy would recover to the 'Pre-COVID' level in Q1 2023
- Analysis already accounts for the positive economic effects of new Federal aid for unemployment insurance and economic impact payments, suggesting significant funding gaps are likely to remain despite CARES act
- Both the degree of impact and recovery paths vary by industry. However, the impact is widespread, affecting most industries and all NY regions

This analysis is based on several key assumptions - the actual impact could be even more severe

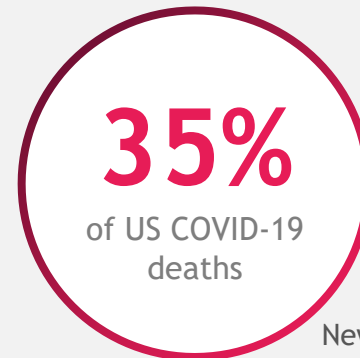
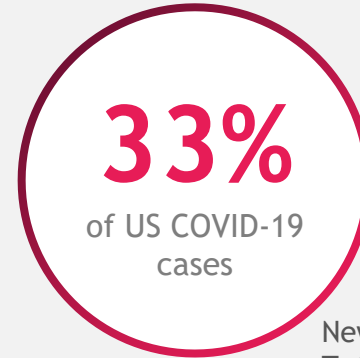
- Short-term impacts. The economy has been deteriorating rapidly, and the pace of deterioration could continue to exceed expectations
- Timing of restart. Analysis assumes restart at the beginning of Q3 2020, which depends on continued success fighting the epidemic and putting in place the conditions which would allow a safe restart minimizing the risk of resurgence
- Pace of restart. Significant uncertainty remains about how quickly certain industries, geographies and population segments will return to normal activity
- Additional epidemic waves. Additional waves (or resurgence due to premature restart) could require re-introduction of health measures interrupting recovery
- Tax structure. Analysis assumes no change to current taxes. However, tax policy decisions could delay the pace and extend the duration of the recovery

Executive summary (III/III)

NY's revenues are projected to decline by \$13.3 billion from the Division of the Budget's February forecast. Year-over-year All Funds tax receipts declined by 8.9% or \$7.4 billion

- To date New York has not received any funding to offset the revenue shortfall. In the absence of additional revenue, significant reductions in spending will be needed (e.g., 84% of All Funds taxes - excludes Miscellaneous Receipts, Gaming, and Federal Funds - is from sales and personal income taxes, which face steep declines)
- NY will need financial support from the Federal government above and beyond the funding allocated to date. Funding made available so far helps mitigate certain impacts, but leaves significant gaps
- Where possible, analysis already accounts for the positive economic effects of some Federal funding (unemployment insurance, economic impact payments)
- Most funding is aimed at avoiding damage vs. recovering from damage to date
- In some cases, Federal funding being allocated is based on existing formulas and not distributed based on COVID-19 impact / economic need

New York State has been hit harder by COVID-19 than any other State



Source: NYS Department of Health and the U.S. Centers for Disease Control and Prevention as of 4/23.

These impacts extend to the NY economy

+2,104%
UI claims

Private sector claims over the last 5 weeks (3/16 - 4/19) compared to the same period in 2019

-20%
sales

Based on latest credit card sales data, for week ending 4/5 vs same week 2019

-78pts
Business conditions index

Empire State Manufacturing Survey for March 2020 shows the steepest monthly drop on record

Before the COVID-19 epidemic, New York enjoyed a decade of economic prosperity

NY economic growth over the last ten years

+1.3M

Jobs created, representing a 20% increase in private employment

+175K

New jobs in high tech sectors¹, a 46% increase

3.7%

Unemployment rate, down from 8.9%

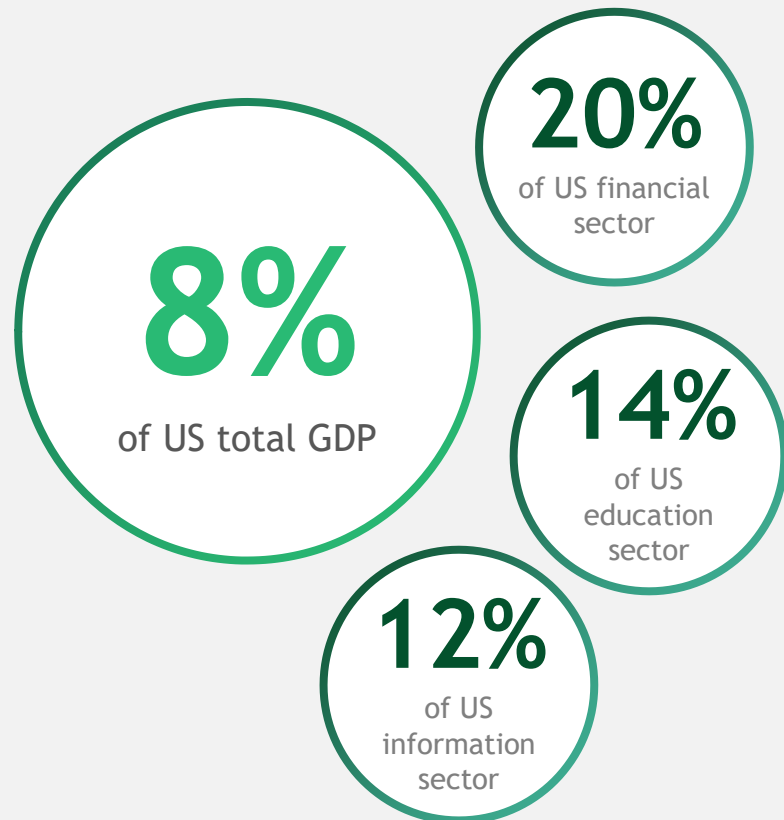
47%

Increase in total wages

1. High tech sectors include IT, precision manufacturing, and life sciences (e.g., biotech, pharma)
Source: NYS Department of Labor; Bureau of Economic Analysis (BEA); NYS Division of the Budget

NY economic health is crucial to the health of the US economy

New York State accounts for...



New York had over **65 million** tourists in 2018

New York City is the **#1 US city** visited by foreign travelers

New York's JFK airport is the **top US airport** for international travel in 2018

NY hosts a disproportionate share of industries that support economic activity nationwide

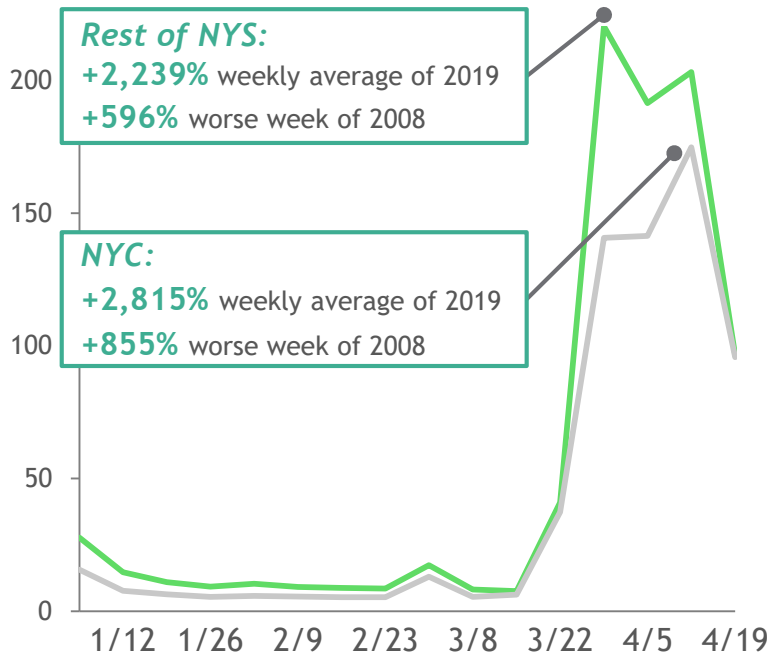
Note: Sectors reflect NAICS

Sources: [US Bureau of Economic Analysis](#); NYC & Company; Airports Council International; US Census (2017); BCG analysis

Nationwide policies put in place to slow the pandemic have reduced infections, hospitalizations and deaths, however they unavoidably result in significant economic harm

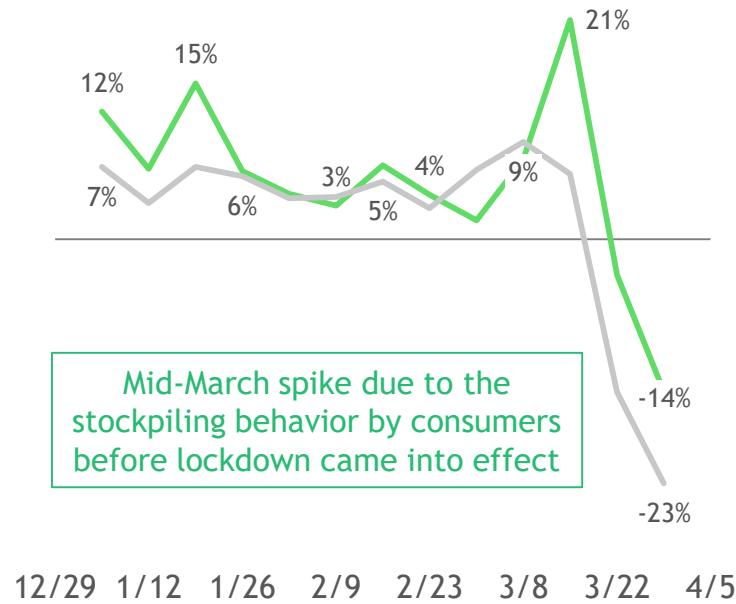
NY unemployment insurance claims surged since mid-March

Weekly claims (thousands) - Private sector only



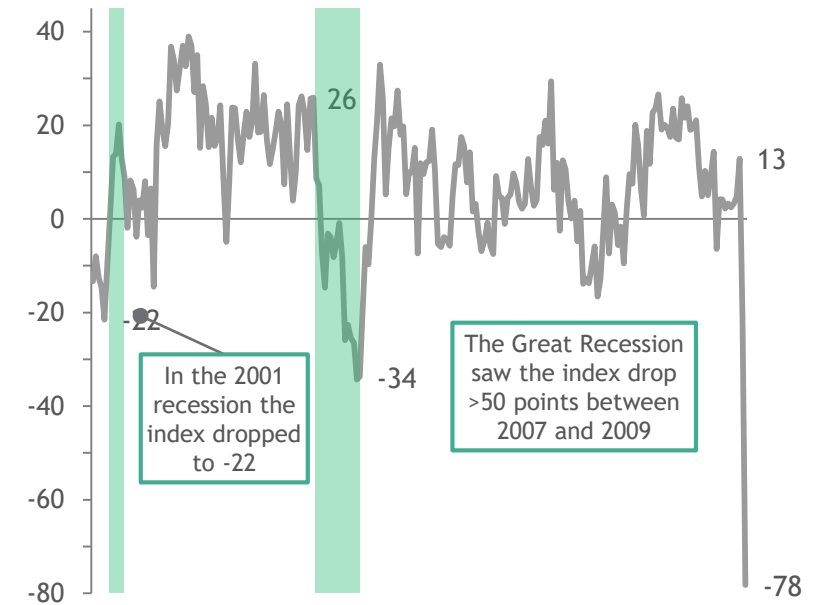
Decline in credit card sales accelerated end of March

YoY weekly change in sales (%)



Manufacturing activity dropped to levels not seen since 2000

Empire State Manufacturing Survey General business conditions index



— Rest of NY State — NY City




Impact to date: Hotels, food services and entertainment hit particularly hard, other industries also shown signs of distress

Industries (% of total NY private employment ¹)	YoY incremental unemployment insurance claims vs 2019 ² - '000s	YoY increase of unemployment insurance claims vs 2019 ² - %	Daily decrease in hourly workers working ³ - %
Agriculture, Forestry, Fishing and Hunting (0.4%)	1	+541%	
Mining (0.1%)	1	+551%	
Construction / Utilities (6%)	118	+1,133%	
Manufacturing (5%)	69	+1,820%	
Wholesale Trade (4%)	45	+2,165%	
Retail Trade (11%)	186	+3,405%	-51
Transportation and Warehousing (3%)	56	+2,201%	-38
Information (3%)	34	+968%	-43
Finance and Insurance (6%)	8	+384%	
Real Estate and Rental and Leasing (2.5%)	19	+1,577%	-32
Professional, Scientific and Technical Services (9%)	44	+1,252%	-43
Management of Companies and Enterprises (2%)	6	+1,488%	-43
Admin, Support, Waste Mgmt and Remediation Svcs (7%)	111	+1,312%	
Educational Services (4%)	33	+2,605%	-64
Health Care and Social Assistance (20%)	149	+2,757%	-60
Arts, Entertainment and Recreation (2%)	50	+2,373%	-71
Accommodation and Food Services (10%)	272	+3,854%	-59
Other Services, Except Public Administration ⁴ (5%)	80	+6,103%	
Total NY State (Private sector⁵)	1,281	+2,104%	

1. Percentage of total NY State private employment based on QCEW (2019Q3); 2. Incremental UI claims filed during 3/16-4/19/20 vs same period in 2019; 3. Percentages represent the daily average change of the total number of hourly employees working 3/9 - 4/12 2020 vs. the average of the same day of the week for the period 1/4 - 31 2020. 4. Other Services include Repair & Maintenance, Personal and Laundry Svcs, etc.. The large increase in UI claims in this sector are driven by Personal and Laundry Svcs. 5. UI claims from the Unclassified category are excluded from the Private sector total. Source: NY State Department of Labor, Homebase Timesheets software

Rate of economic recovery after lockdown period expected to vary by industry as well as by region

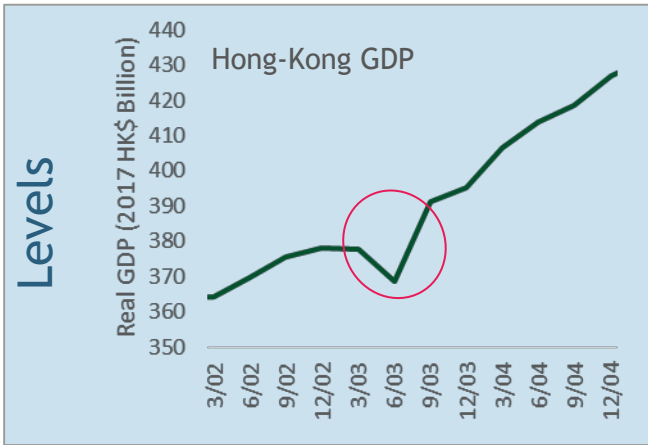
The Covid scenario used in this analysis makes the following, high-level assumptions:

-  Epidemic
 - Covid epidemic continues to spread in different parts of the US until late Q2 / early Q3 2020 with peak dates varying across US cities
 - Current lockdown policies implemented nationwide are gradually lifted beginning in late Q2 2020
-  US economy
 - US economy enters a recession at the end of Q1 2020 prompted by nationwide lockdown policies
 - US economy begins to recover after major economic centers gradually lift current restrictions
-  NY economy
 - Short term impact on NY economy differs by industry as reflected in latest data (e.g. UI claims)
 - After the restrictions are lifted in NY, the recovery pattern depends on industry-specific factors (e.g. pent up demand, social distancing measures, supply chain disruptions, behavioral changes)
 - Some industries experience an acceleration of trends that predate Covid-19 (e.g. more digital banking) and adjust to a new normal (e.g. fewer brick and mortar branches)
 - New York City and the surrounding metropolitan area are assumed to be impacted more severely than the rest of NY state due to both the incidence of the epidemic and the local industry mix
 - Long term GDP potential of NY state is not affected by the epidemic

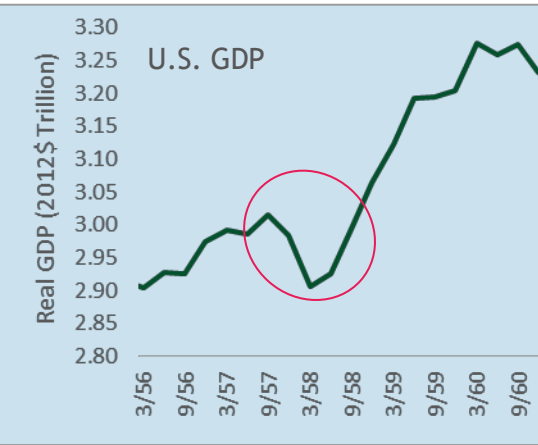
The above assumptions were formulated for analytical purposes only, reflecting publicly available data and independent subject matter expertise. These assumptions do not reflect future policies.

Empirically, flu shocks have been V-shaped - at this point - Covid-19 is a deep V-shaped, veering towards a U-shape

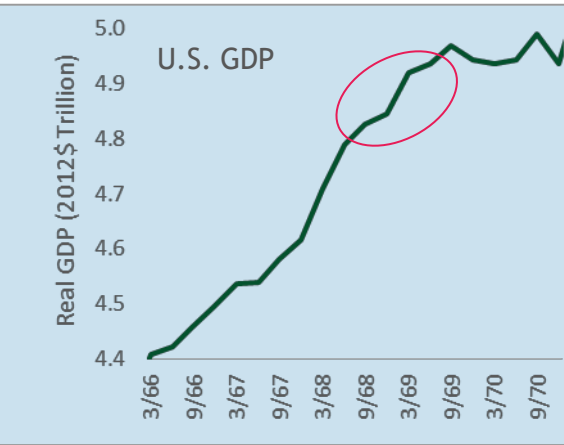
2003 SARS
(299 deaths in Hong Kong)



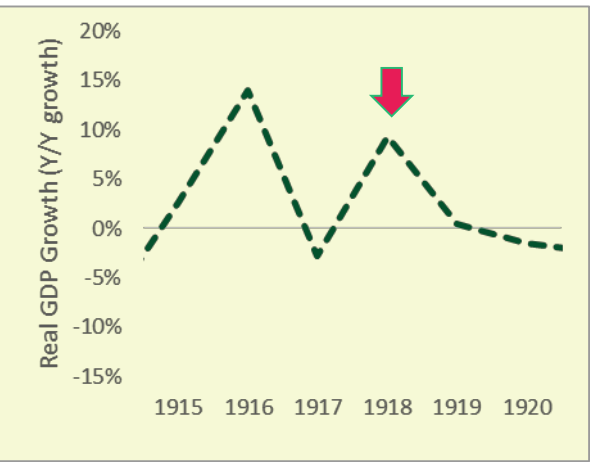
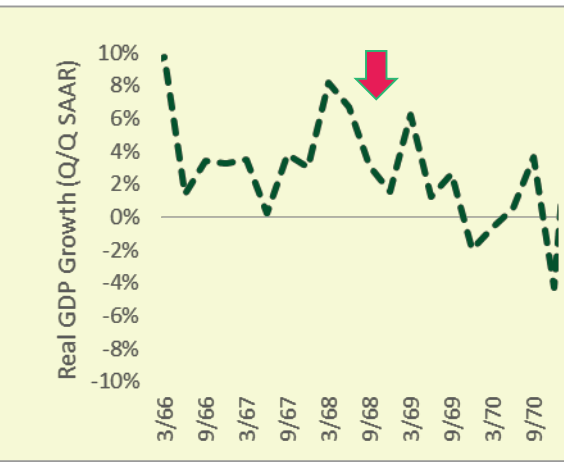
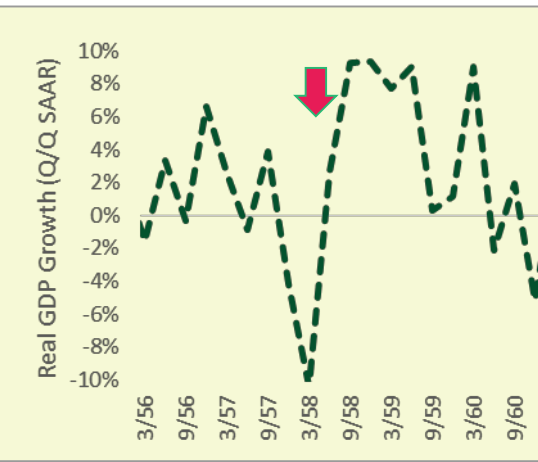
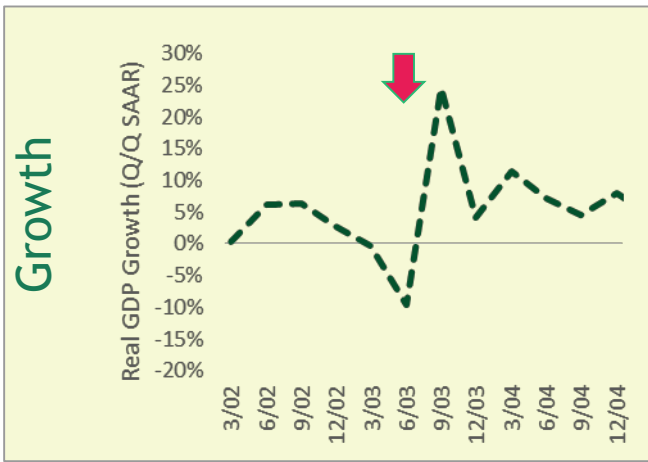
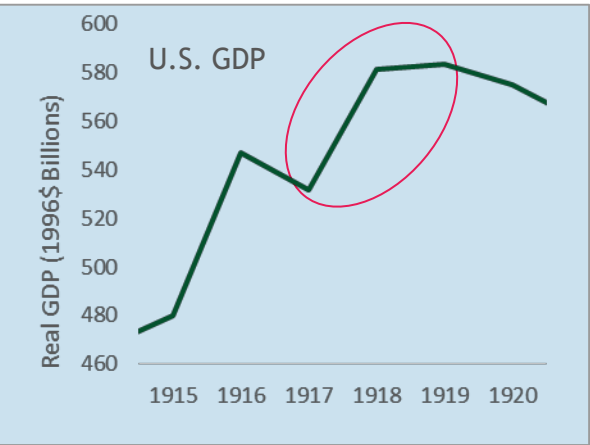
1957/58 H2N2
(116k deaths in U.S.)



1968 H3N2
(100k deaths in U.S.)



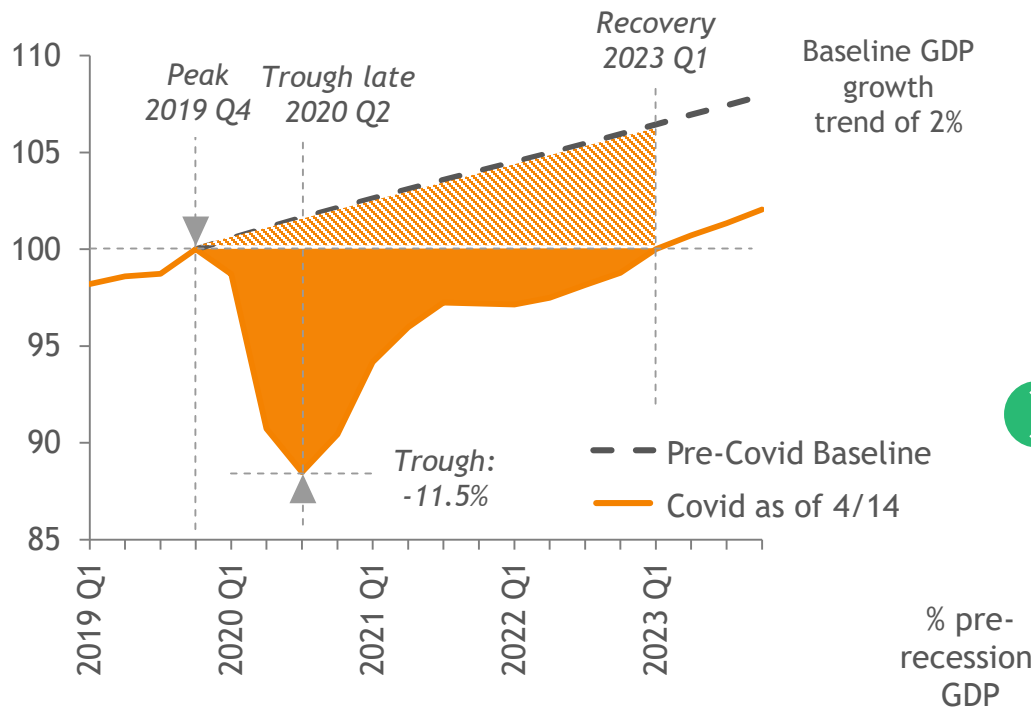
1918 Spanish Flu
(675k deaths in U.S.)



Latest estimates of economic impact in NY is \$243B vs. pre-Covid GDP level, and an additional \$202B vs. pre-Covid trend, for a total loss of \$445B

A third of the total loss occurs in 2020 and the rest over the following 9 quarters until full recovery

NY Real GDP based on 4/23 COVID scenario



Economic impact:	1. Area under water		\$243B	14%
	2. Total loss		\$243B + \$202B = \$445B	

Total economic impact estimated at \$445B with a full recovery by early 2023

Economic loss to the NY Economy is estimated at \$243B vs. pre-Covid GDP level cumulatively over the course of the full recovery, with an additional \$202B relative to pre-Covid growth trend, for a total loss of \$445B, of which a third occurs in 2020 and the rest in 2021-2023

Real GDP does not fully recover until Q1 2023, when it reaches pre-Covid levels, yet still 7% below where it would have been without the Covid impact, assuming continued baseline GDP growth trend of 2% per year

The trough occurs in late Q2 2020 and coincides with the end of the complete lockdown period

In Q3-Q4 2020 there is a partial but rapid recovery as some pockets of the economy turn back on, albeit at reduced pace

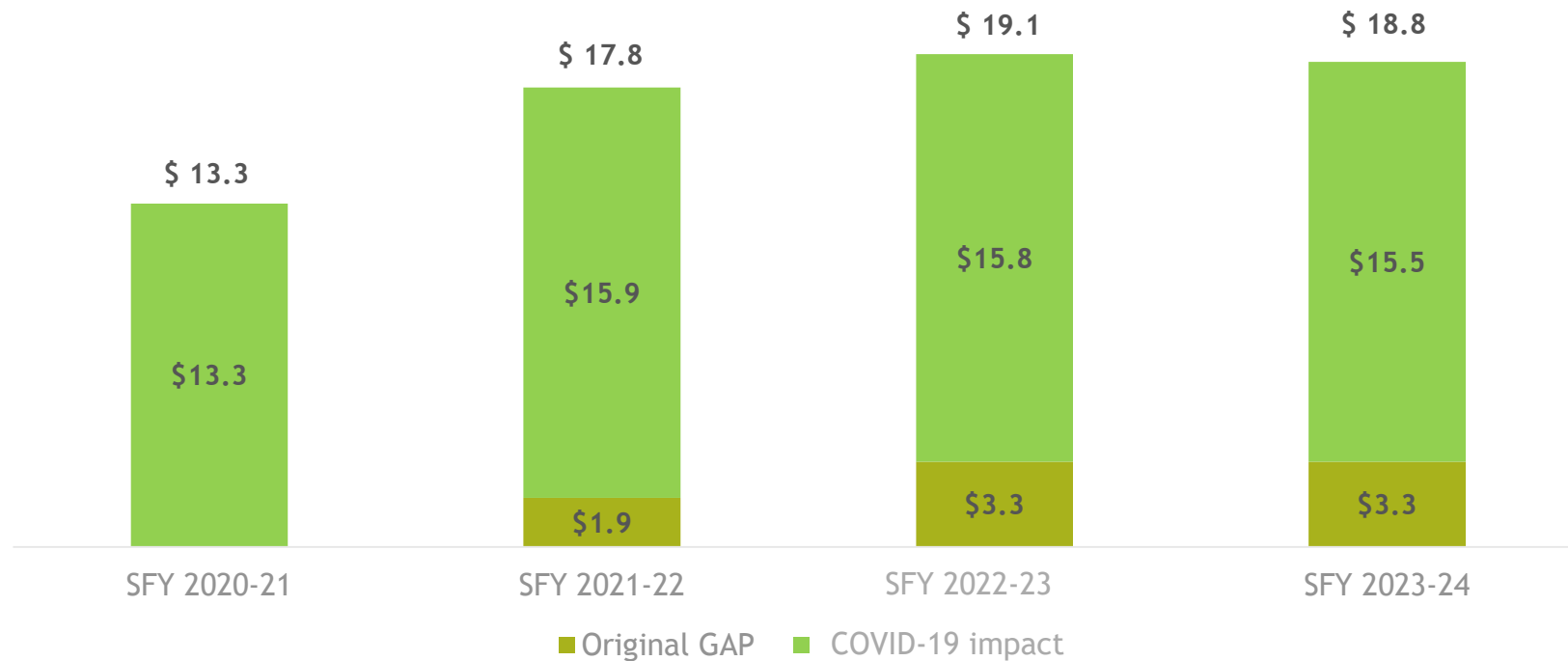
After Q4 2020 and until 2023 the economy is in a slow-recovery mode similar to previous recessions

Notes: NY Real GDP rebased to value in 2019 Q4. Total economic impact is calculated as the "area under water" relative to the most recent peak plus "area above water", measured as a percentage of pre-recession GDP. GDP impact figures are converted to current dollars based on Q4 2019 level.

Source: BEA, NY DOB, BCG Analysis

General Fund receipts are projected to decline by \$13.3B for SFY 2021 and \$61B from 2021-24

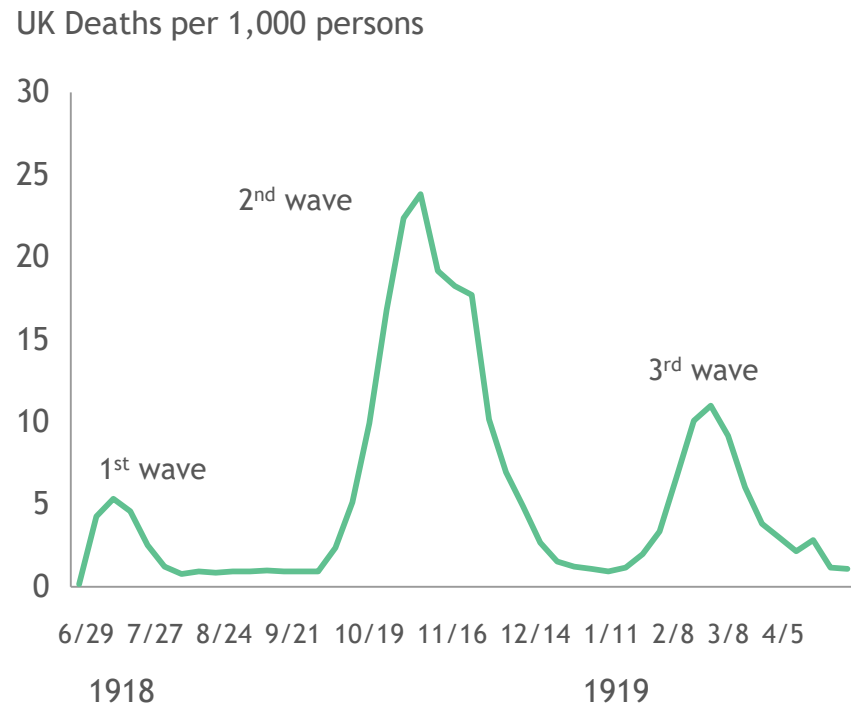
Total budget gaps over the plan period from SFY 2021-24 increased from \$8B to \$69B (\$B) as a result of COVID-19



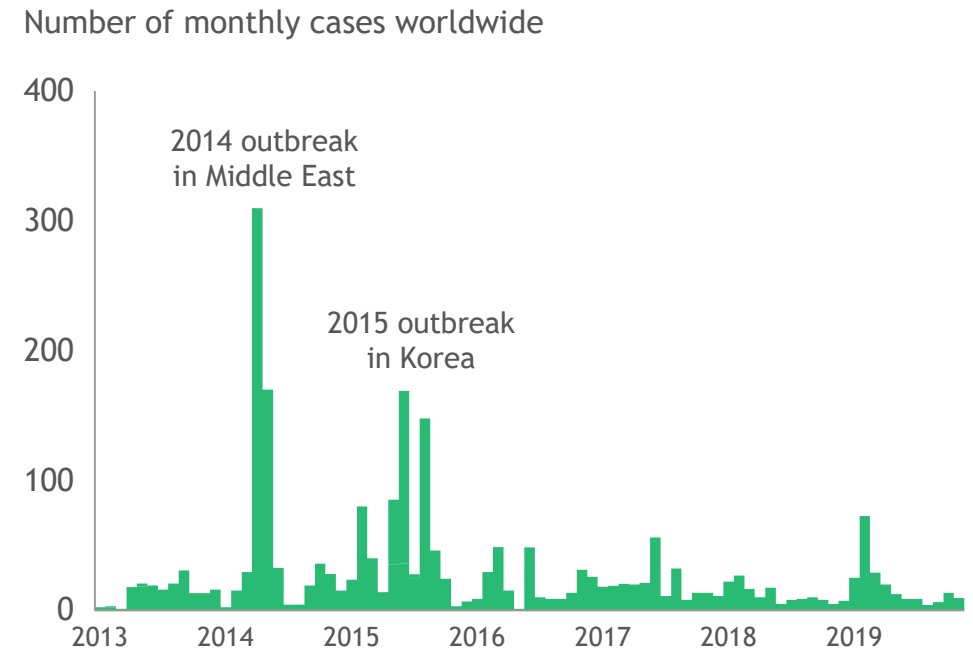
Note: The figures on this page were independently produced by NY DOB. These estimates were produced in parallel with the rest of the analyses in this presentation on the impact of COVID on the NY economy. NY DOB will continue updating assumptions as the crisis unfolds.
Source: NY DOB analysis.

Historically, many outbreaks experienced multiple waves—risks remain until vaccine in hand—public health decisions will impact recovery time

Example: Spanish Flu



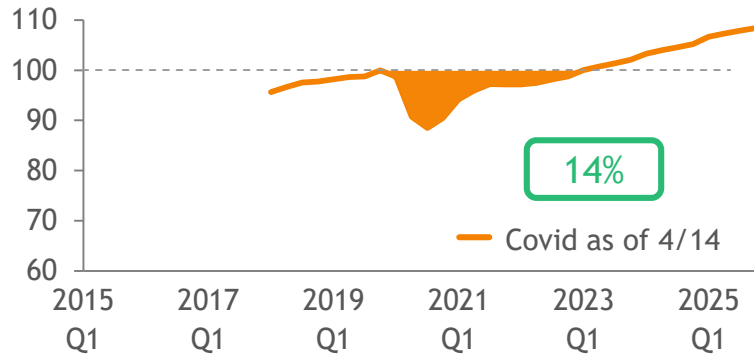
Example: MERS (caused by a coronavirus)



Impact of this recession on the NY economy expected to be smaller and shorter than the worst ones of the past 100 years, but more severe than recent ones

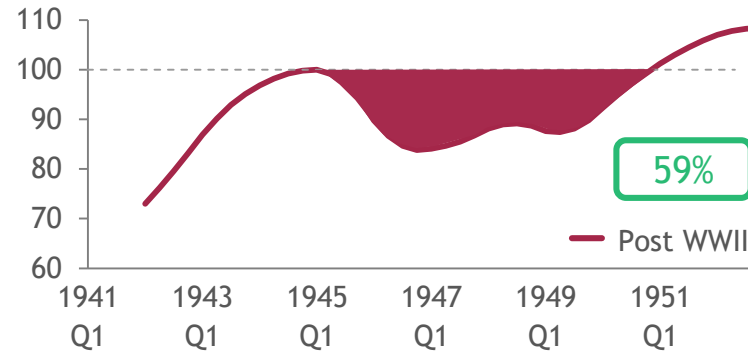
COVID (as of 4/23)

NY Real GDP (normalized)



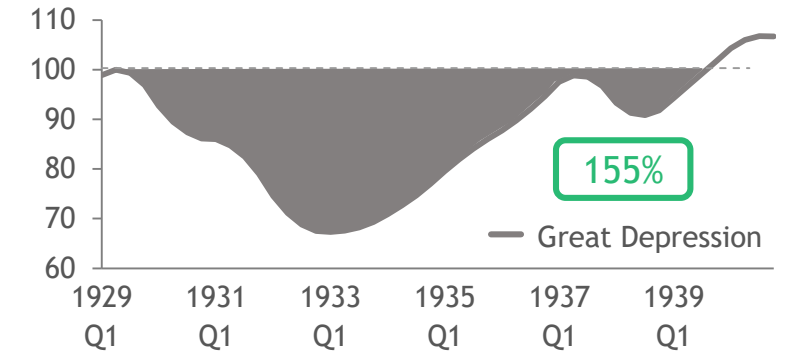
Post WWII (1945)

US Real GDP (normalized)



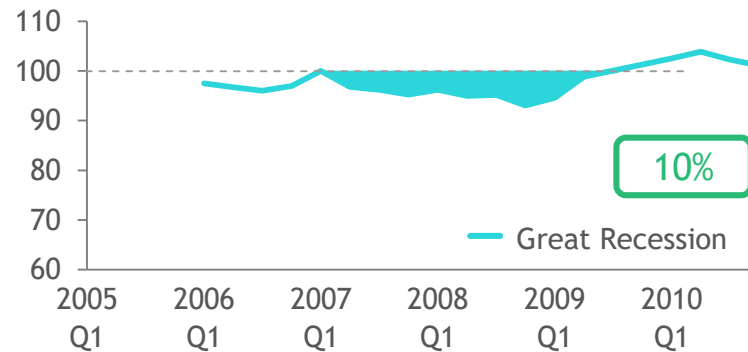
Great Depression (1930)

US Real GDP (normalized)



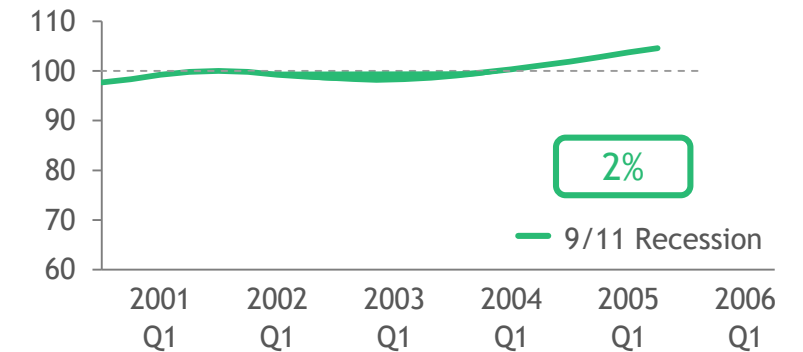
Great Recession

NY Real GDP (normalized)



9/11 Recession

NY Real GDP (normalized)



The figure inside each chart denotes percentage of pre-recession GDP destroyed during the recession

Notes: NY and US Real GDP rebased to their value in the latest pre-recession quarter. Total economic impact is calculated as the total "area under water" relative to the most recent peak, measured as a percentage of pre-recession GDP.

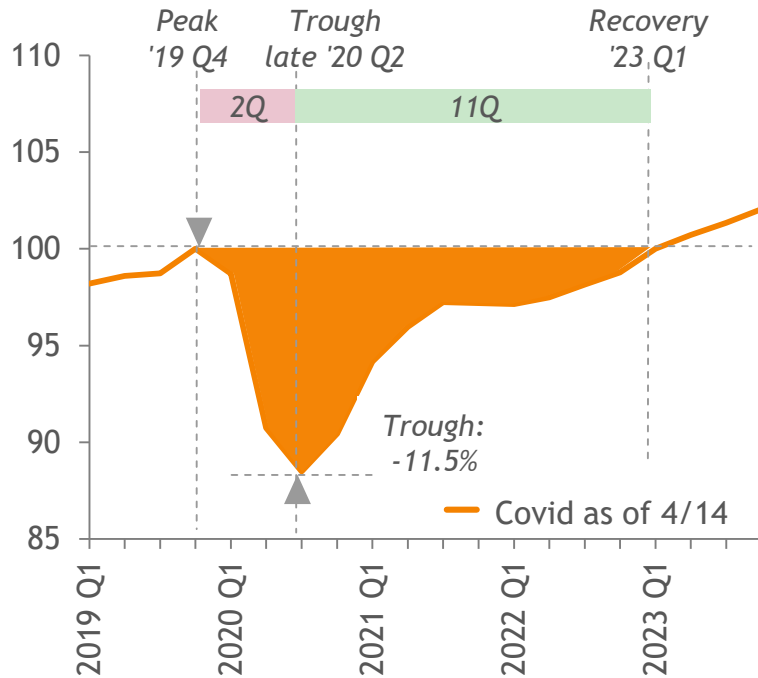
Source: BEA, NY DOB, BCG Analysis

Estimated impact of this recession on the economy is greater than 9/11 and the Great Recession, characterized by a steeper decline from peak to trough

Latest COVID as of 4/23

Impact index: 14% of pre-recession GDP

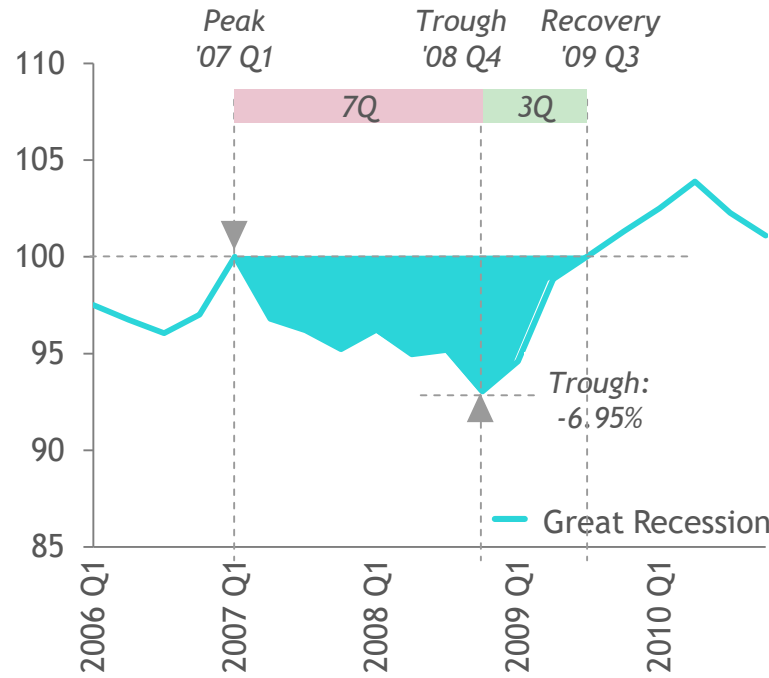
NY Real GDP (normalized)



Great Recession

Impact index: 10% of pre-recession GDP

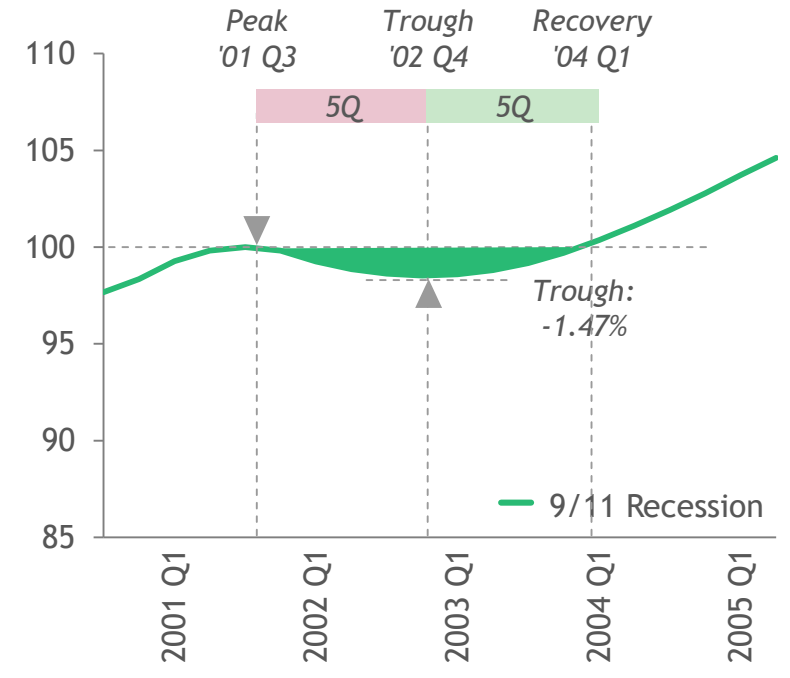
NY Real GDP (normalized)



9/11 Recession

Impact index: 2% of pre-recession GDP

NY Real GDP (normalized)

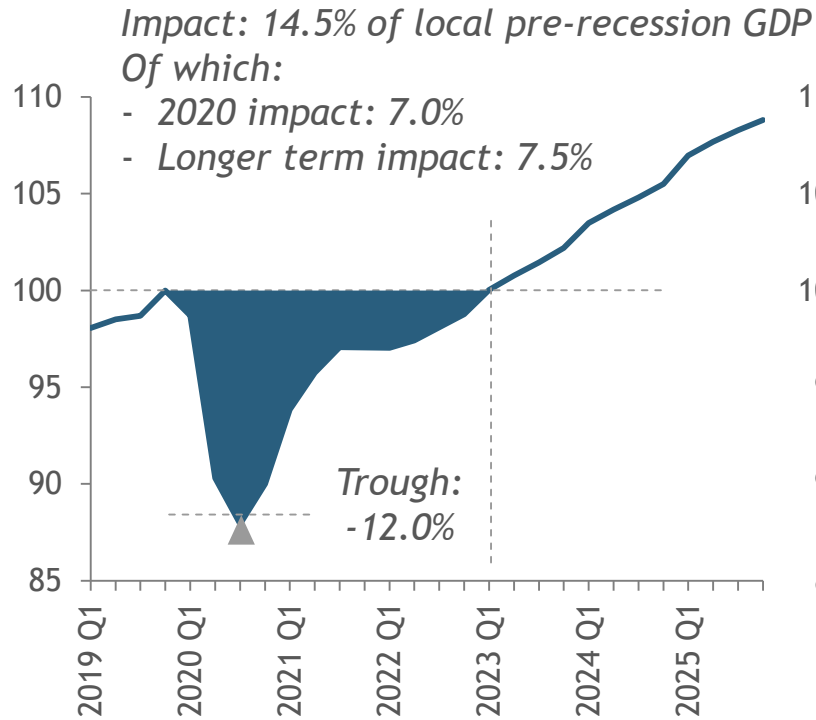


Notes: NY Real GDP rebased to its value in the latest pre-recession quarter. Total economic impact is calculated as the total "area under water" relative to the most recent peak, measured as a percentage of pre-recession GDP. Quarterly GDP was interpolated from annual figures where unavailable.

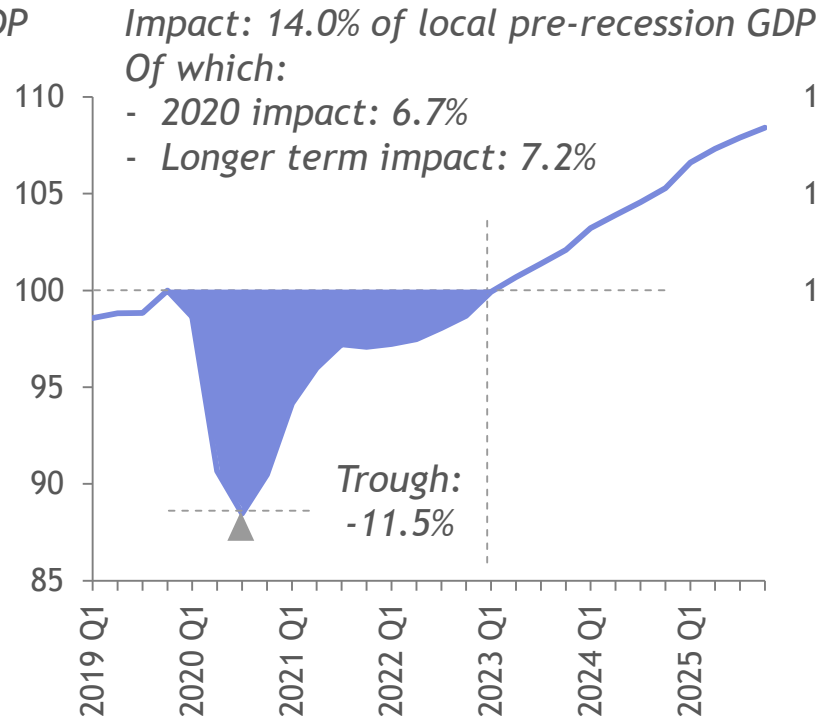
Source: BEA, NY DOB, BCG Analysis

Economic impact expected to be felt throughout NY, with Greater Metro affected most based on epidemic conditions and concentration of highly impacted industries

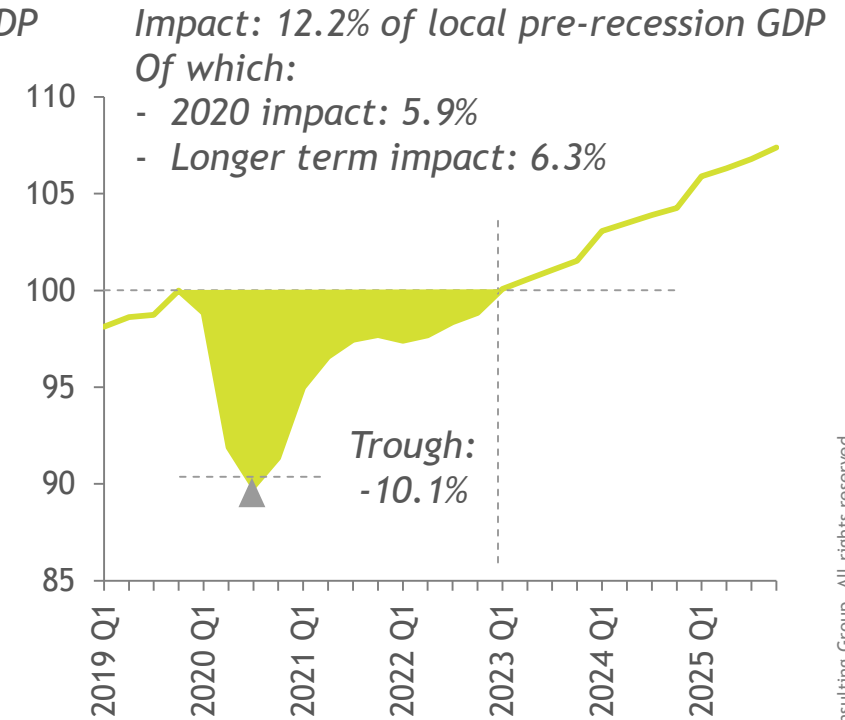
NYC - Real GDP



Greater Metro (excl. NYC) - Real GDP

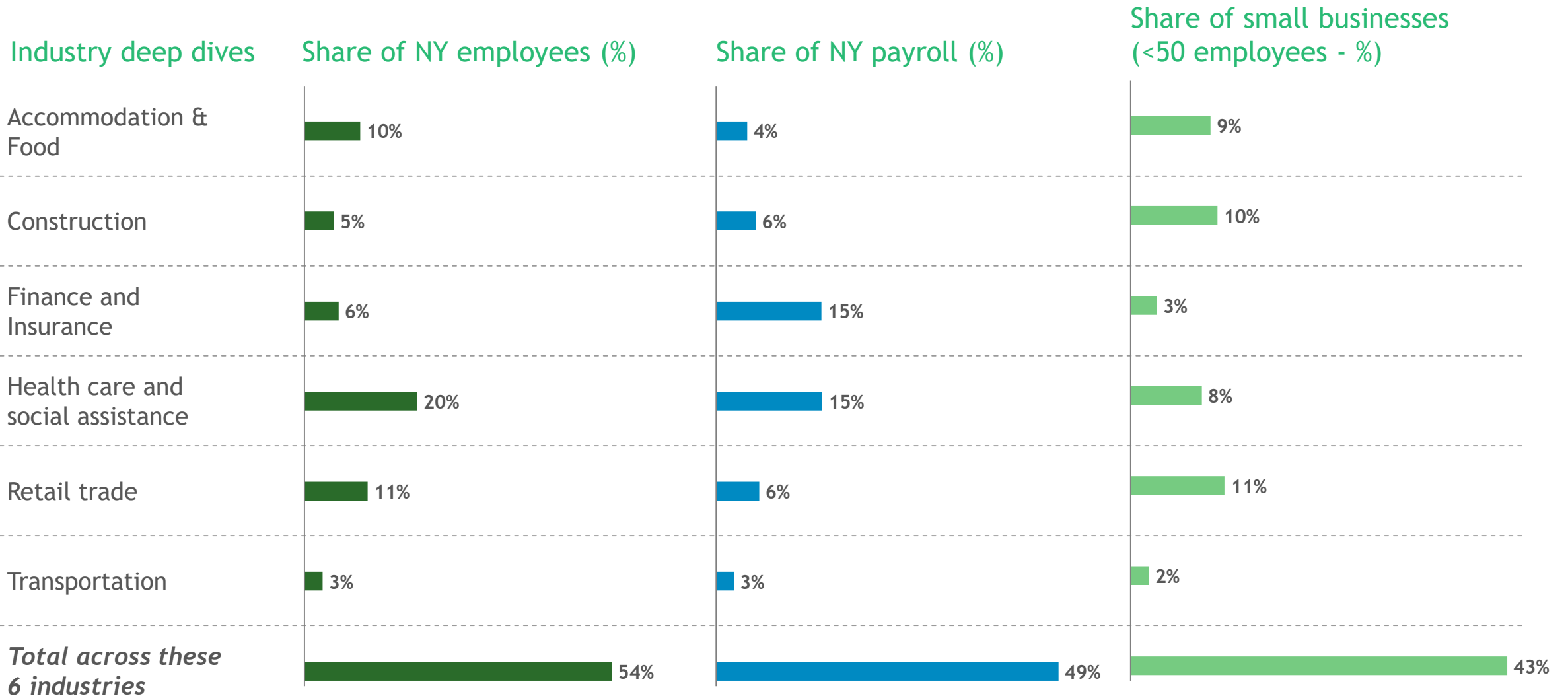


Rest of NY State - Real GDP



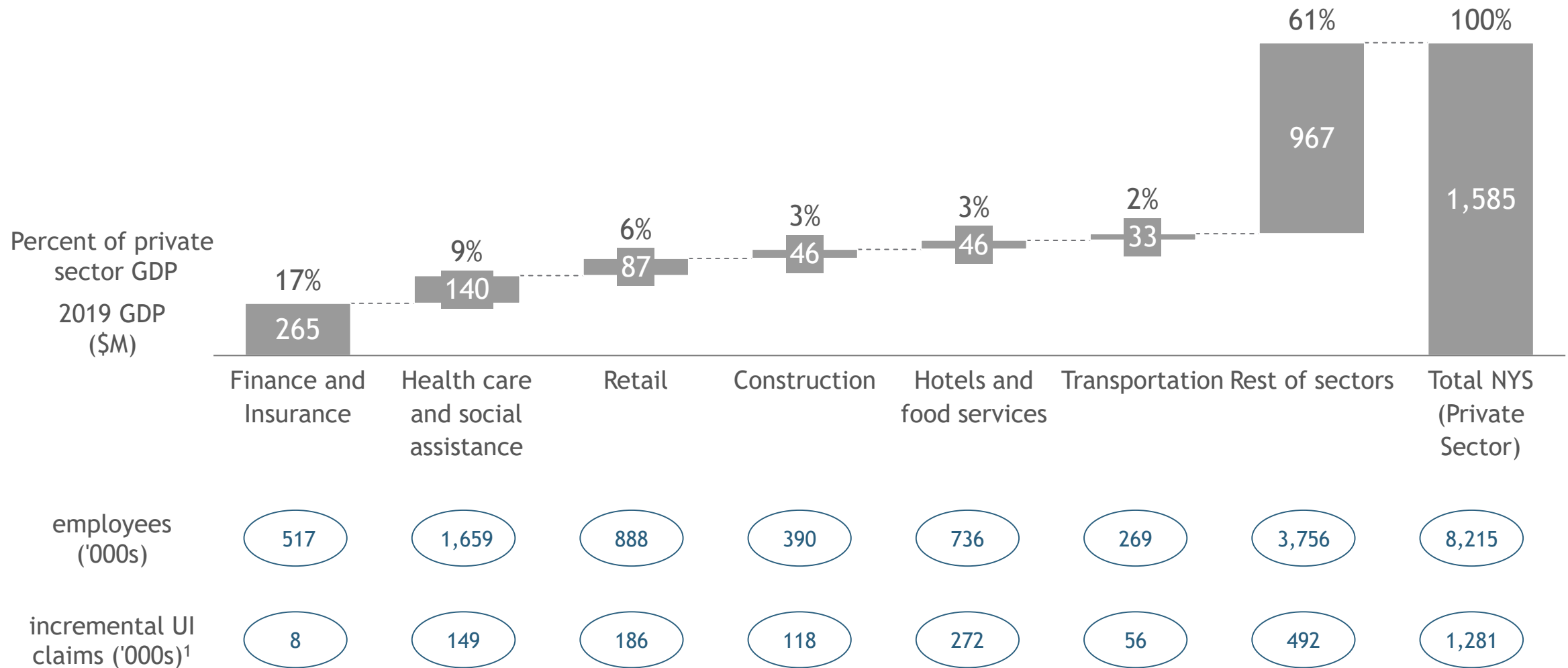
NYC and Greater Metro expected to see the worst impact based on incidence of the epidemic, steeper growth in UI claims in recent weeks and relatively higher concentration of highly impacted industries (e.g. Hotels and Food services)

Six NY industries account for a large share of the State economy based on percent of employees, payroll and small businesses



Source: Private sector employment figures based on Quarterly Census of Employment and Wages 2019Q3, Department of Labor.

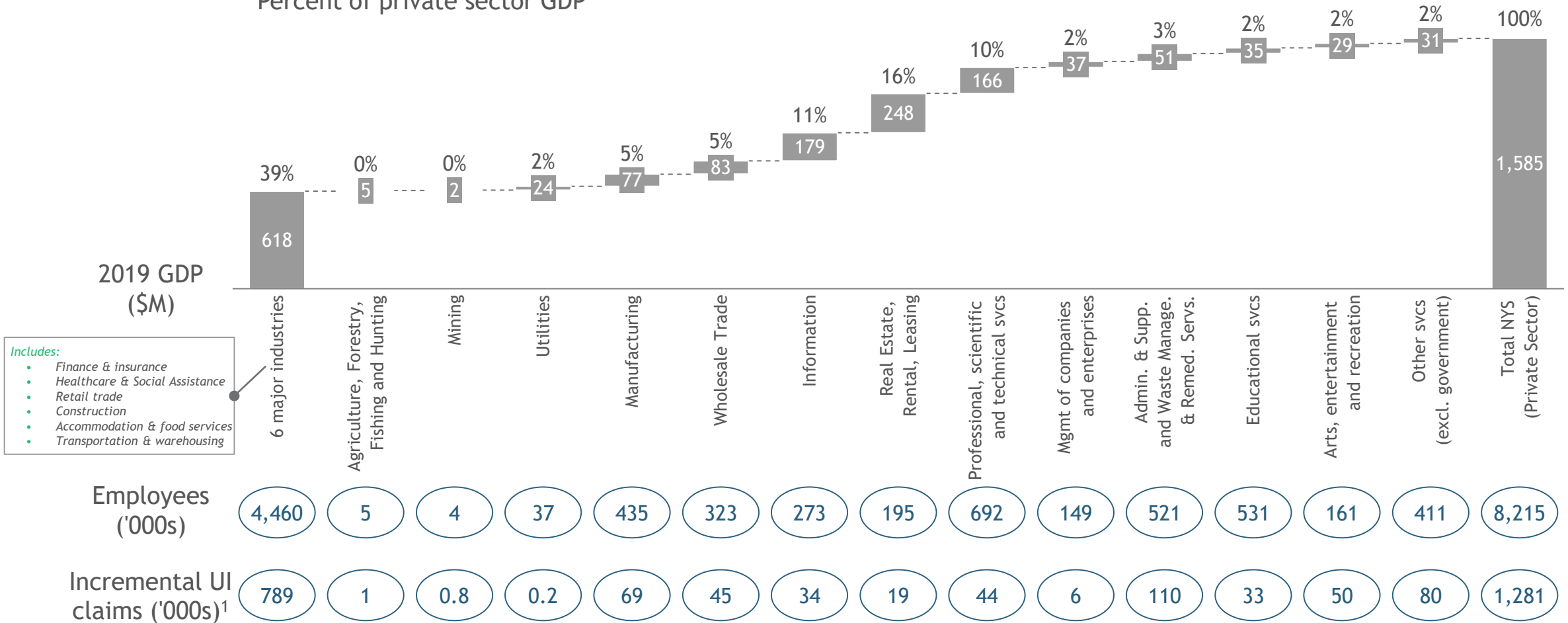
These six sectors account for 40% of NY private sector GDP, over 50% of its workforce, and over 60% of the incremental UI claims filed recently



1. Incremental UI claims filed during 3/16-4/19/20 vs same period in 2019. UI claims from the Unclassified category are excluded from the Private sector total.
 Source: Bureau of Economic Analysis / Regional Economic Accounts converted to current 2019 dollars, NY Department of Labor.

Snapshot of the entire NY economy based on 2019 GDP, March 2020 employment & most recent UI claims

Percent of private sector GDP



1. Incremental UI claims filed during 3/16-4/19/20 vs same period in 2019. UI claims from the Unclassified category are excluded from the Private sector total.
 Source: Bureau of Economic Analysis / Regional Economic Accounts converted to current 2019 dollars, NY Department of Labor.

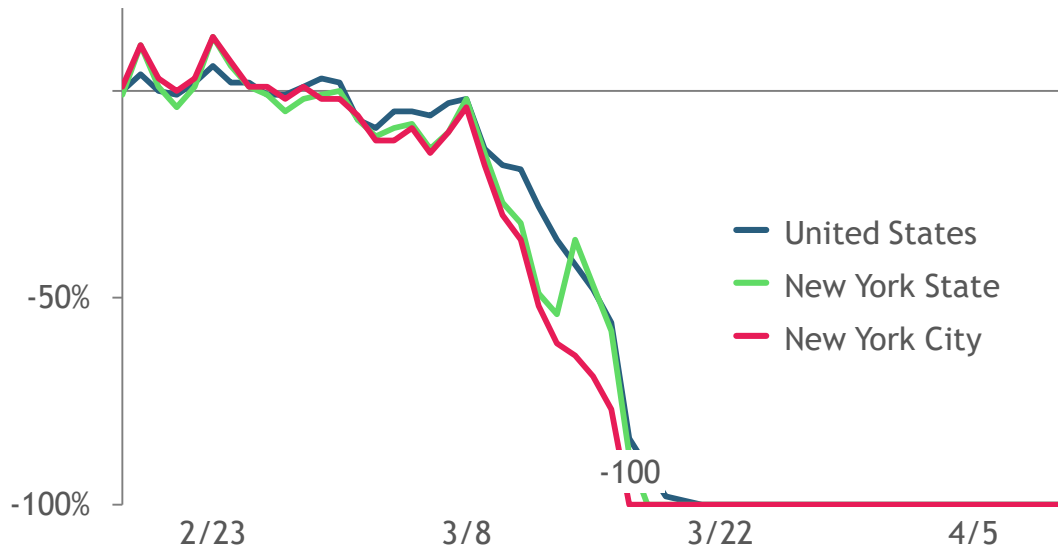


Accommodation and Food Service: Severe short-term impact followed by a slower recovery than in prior recessions due to social distancing

Short term impact

- Sharp declines in hotel revenue (-80%) and restaurant reservations (-100%)
- +3,854% spike in unemployment claims¹

YoY % change in USA, NY State and NY City restaurant reservation (Daily data for Feb - Mar 2020)

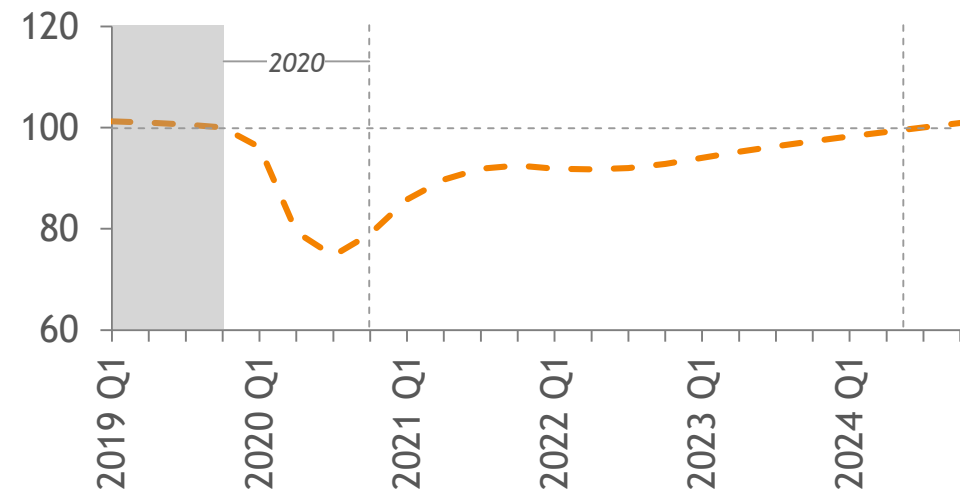


Recovery path

- In recent recessions, quicker than avg recovery
- For C-19, likely slower given epidemic (e.g., social distancing requires reduced seating in restaurants)

Total impact: 40.6% of pre-recession industry GDP

- 2020 impact: 15.1%
- Longer term impact: 25.5%



1. Incremental UI claims filed during 3/16-4/19/20 vs same period in 2019
 Source: Daily restaurant reservation data breakdown by State and major Cities, OpenTable®. BCG analysis.

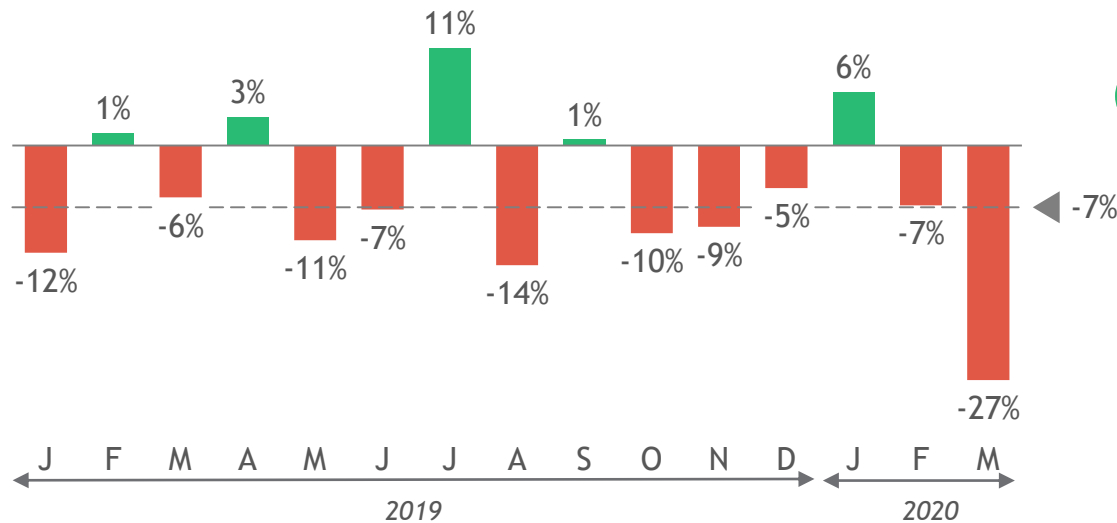


Construction: All non-essential activities halted due to lockdown, recovery expected to be slower than average

Short term impact

- 27% decline in NYC construction permits
- 53% of GCs report halted / cancelled projects
- +1,133% spike in unemployment claims¹

YoY % change of monthly construction permits issued in NYC

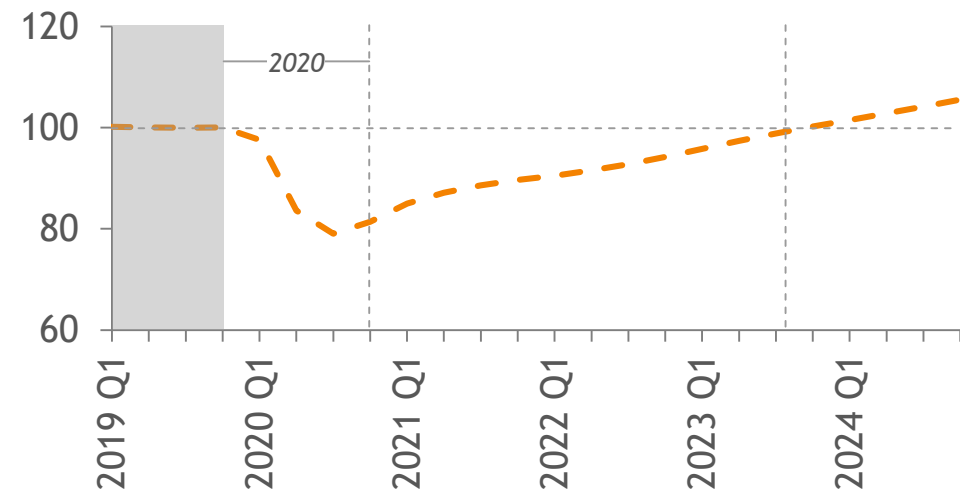


Recovery path

- In '08, construction hit hard with longer than average recovery - due to housing market bust
- For C-19, recovery likely slower than for average industry

Total impact: 36.8% of pre-recession industry GDP

- 2020 impact: 12.3%
- Longer term impact: 24.5%



1. Incremental UI claims filed during 3/16-4/19/20 vs same period in 2019
 Source: Monthly street construction permits data issued by NYC Department of Transportation (DOT). BCG analysis.

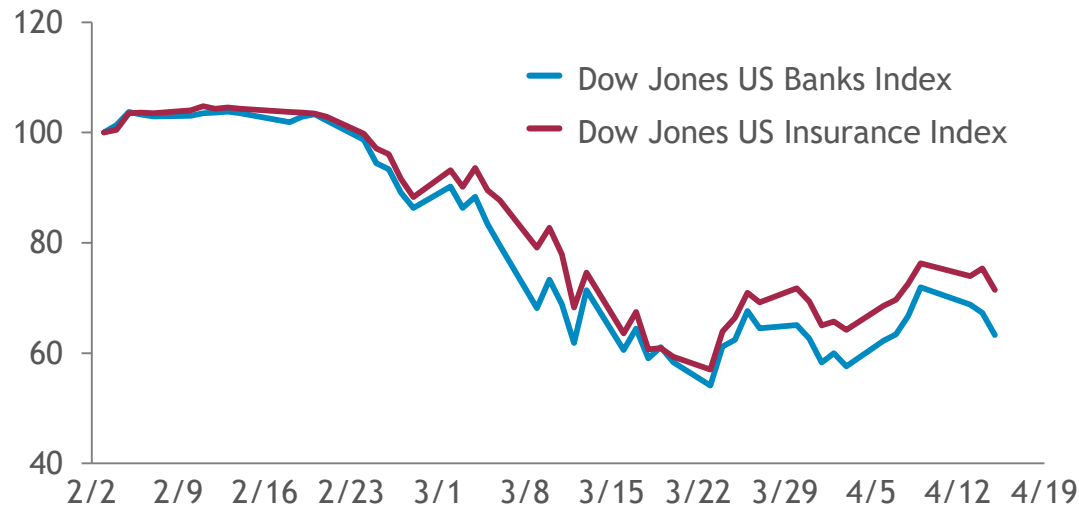


Finance and Insurance: industry employment not impacted by the lockdown itself but expected headwinds due to upcoming recession

Short term impact

- Decline in profits due to increased loan loss / claims & low interest rates
- Impacts on employment limited to date
- Likely significant impact on NY personal income tax revenue due to lower bonuses, capital gains

Dow Jones US Banking and Insurance indexes (Daily)



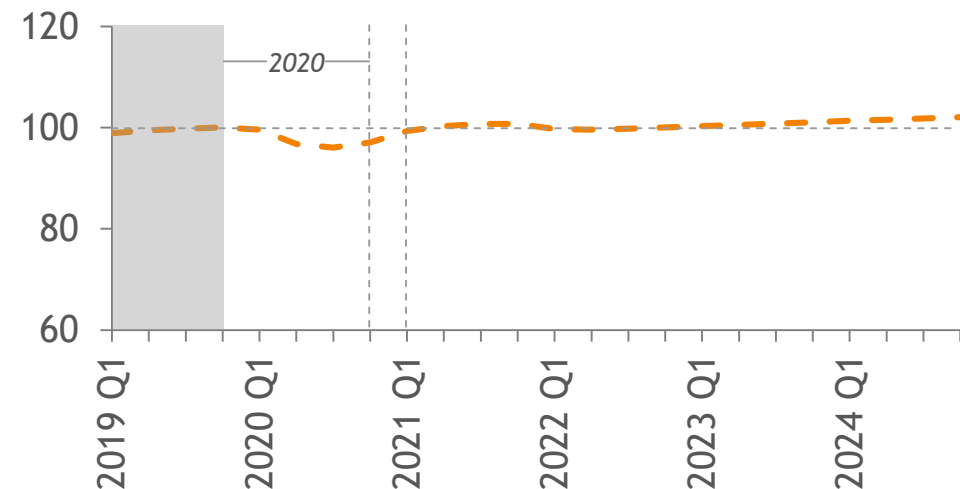
Source: Daily published Dow Jones US industry indices on S&P Capital IQ. BCG analysis.

Recovery path

- In recent recessions, slower than rest of economy
- For C-19, accelerated shift to digital channels and consolidation of financially impacted firms could drive downward pressure on total employment

Total impact: 2.8% of pre-recession industry GDP

- 2020 impact: 2.3%
- Longer term impact: 0.5%





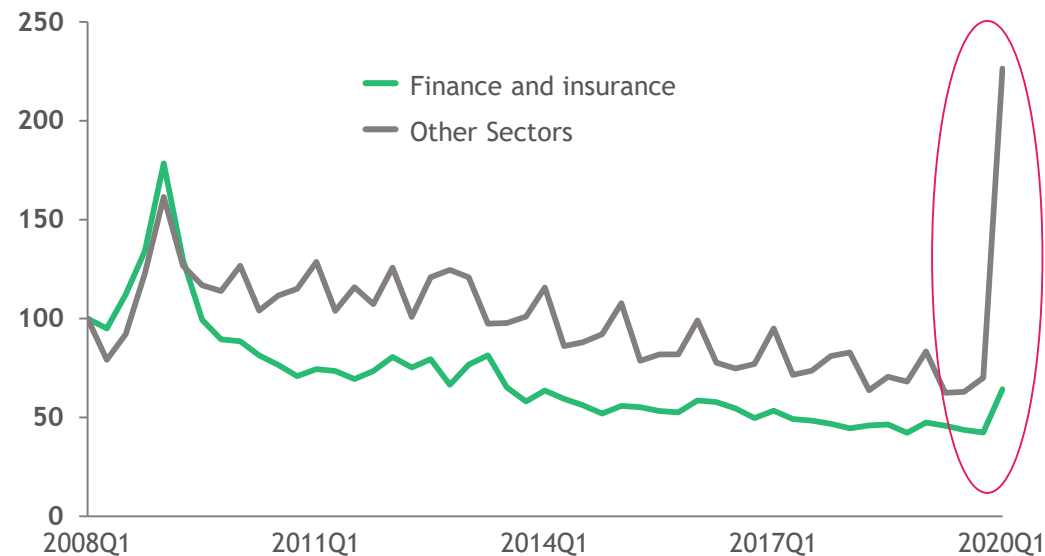
Finance and Insurance: Based on unemployment claims to date and unlike other sectors, the impact of Covid-19 is neither direct nor immediate

Increase in UI claims from Finance and Insurance has been much milder than in other sectors

Three main factors may explain why Covid has had a limited impact so far

of NY State unemployment insurance claims (Q1 2008 - Q1 2020)

2018Q1 = 100



Source: Unemployment claims from NY State Department of Labor, monthly frequency.



Good penetration of **Digital** channel (e.g. online banking, phone services, virtual assistance)

- This applies to the industry as a whole, however some players have invested in digital more than others
- Digital laggards will either try to catch up or become acquisition targets as their customer base shrinks



Non-branch workforce's ability to **work remotely**

- Conversely, an extended lockdown may have implications on Branch staff, especially in Branches that were already performing badly before Covid



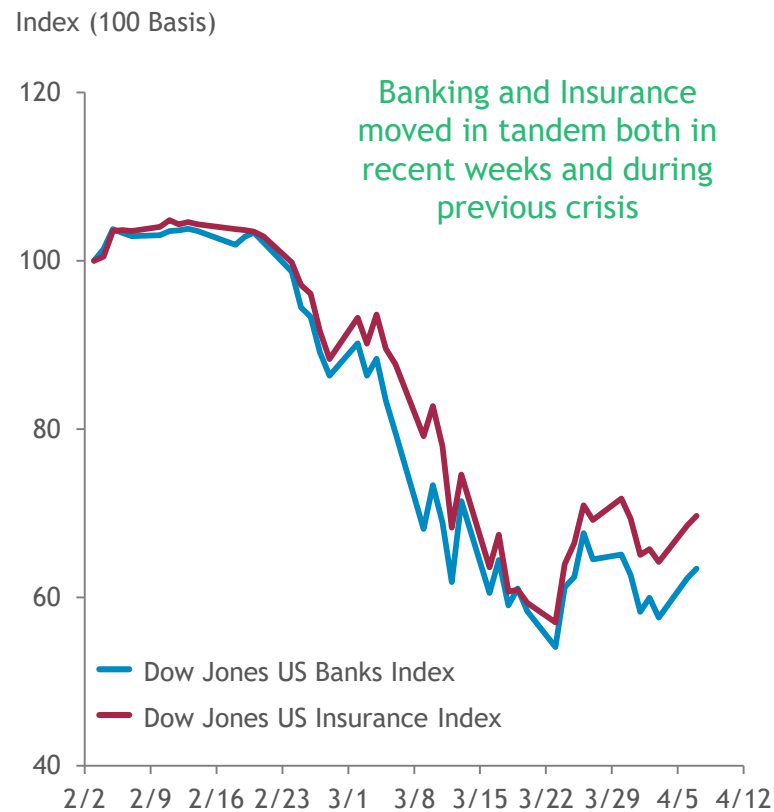
Strong **liquidity and capital** position driven by years of regulatory discipline (e.g. annual stress testing)

- Larger Banks were forced to build liquidity and capital buffers to comply with regulations enacted after the Great Recession - this allows them to absorb larger shocks than they were able to 10 years ago
- Smaller players were not subject to the same discipline and may not have built comparable buffers



Finance and Insurance: Industry impacts expected to be indirect and delayed due to economic headwinds in the coming quarters

Bank and Insurance stock indexes dropped significantly since US epidemic escalated



Banking and Insurance executives anticipate challenges to come...

“Recognizing the extraordinary extension of new credit ... and knowing there will be a major recession mean that **we are exposing ourselves to billions of dollars of additional credit losses** as we help both consumer and business customers through these difficult times.”

*Jamie Dimon,
CEO of JPMorgan Chase,
4/6/2020*

“The impact to insurance companies comes very much on the financial side, as we have **interest rates dropping dramatically**. All reinvestment and new investment in cash flows happen at a lower rate, which is a **challenge for the profitability of that business.**”

*Thomas Holzheu,
Swiss Re's Chief economist for the Americas,
3/16/2020*

What banks and insurers will see in coming quarters



Banks will experience increased credit losses as more businesses fail and default

Banks



Banks and Insurers will earn decreased revenues as economic activity slows down across most business segments



Insurers will face lower margins and increased difficulties in their asset liability management due to an exceptionally low interest rate environment

Insurers

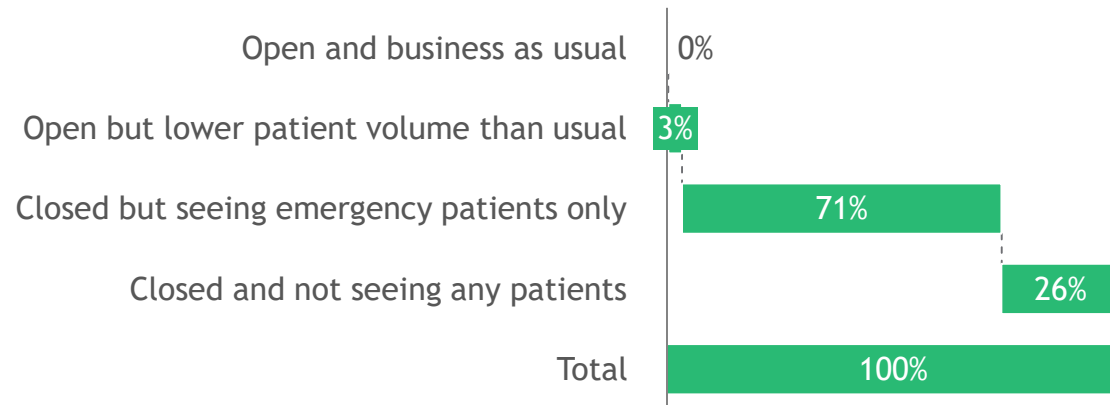


Healthcare (Ambulatory Services only): Moderate impact during the lockdown, followed by a fast recovery due to pent-up demand

Short term impact

- Significant revenue declines due to delay of elective / non-essential procedures
- >90% of dental clinics closed
- +2,757% spike in unemployment claims¹

Percentage of NY dental clinics by opening status

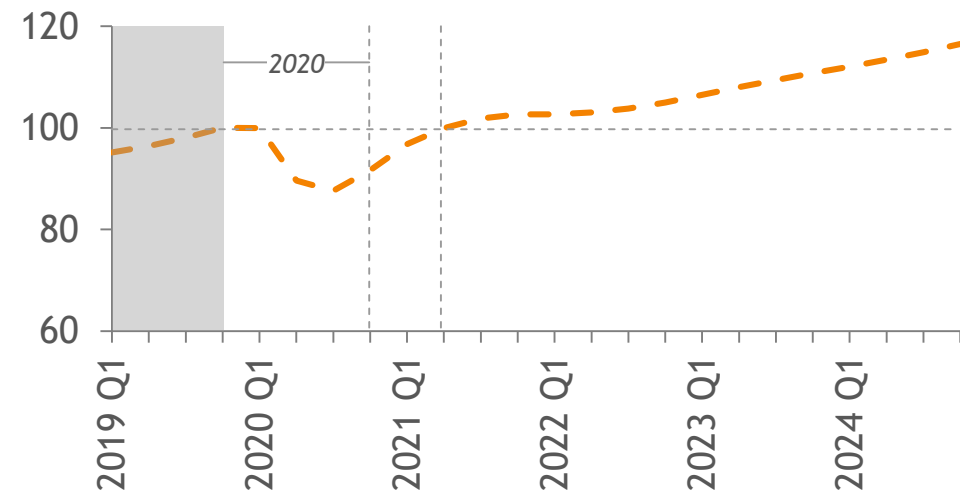


Recovery path

- In recent recessions, <1% impact experienced
- For C-19, likely return of 'pent-up' demand, although social distancing protocols & telehealth shift may impact operating models & profits

Total impact: 8.6% of pre-recession industry GDP

- 2020 impact: 6.7%
- Longer term impact: 1.9%



1. Incremental UI claims filed during 3/16-4/19/20 vs same period in 2019 in the entire Healthcare industry, not only Ambulatory Services. Source: Survey by American Dental Association on 4/3/2020. BCG analysis.

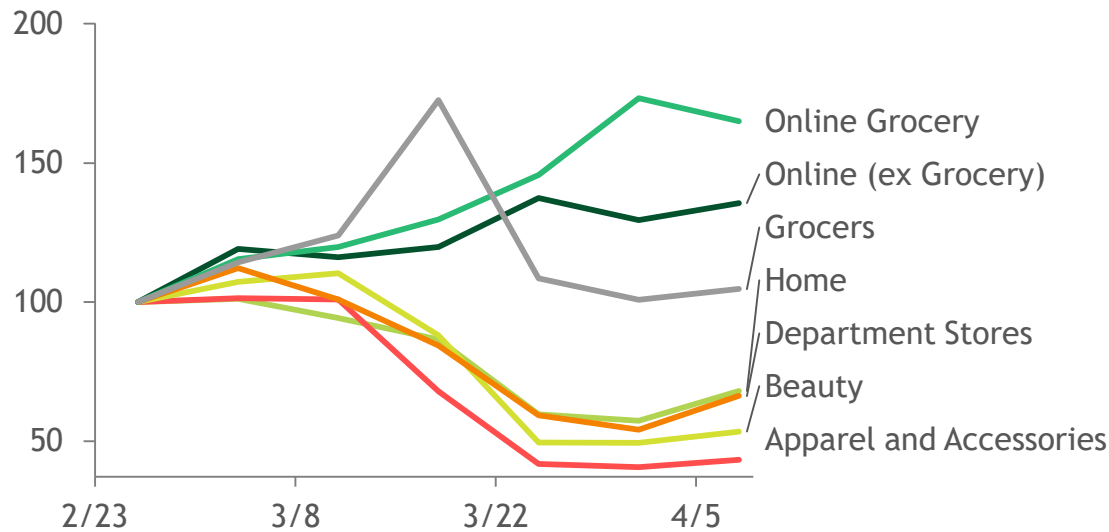


Retail: Impacts and recovery vary among essential vs. non-essential retailers and depend on physical vs. online channel

Short term impact

- Non-essential sales down ~30%, essential retail sales (i.e., groceries) returning to flat, online up >50%
- +3,405% spike in unemployment claims¹

Credit card sales change YoY in NY State (% , 2019-2020)

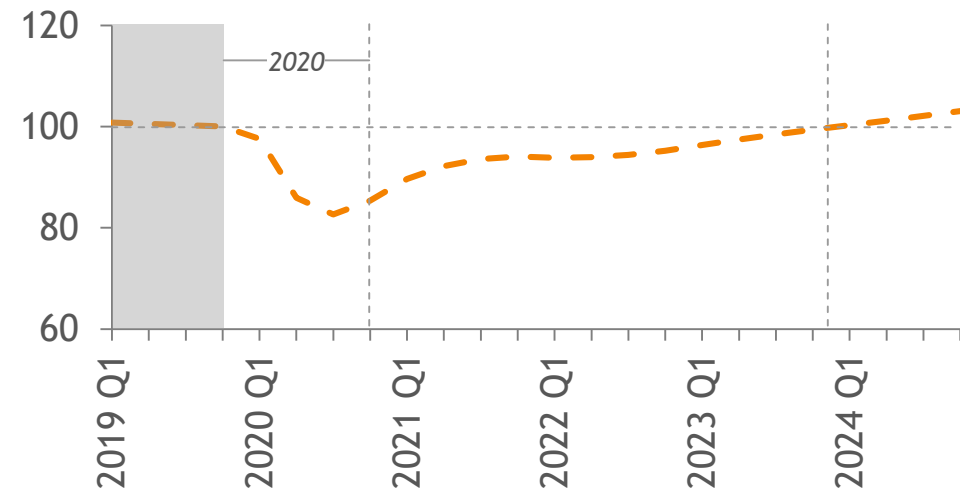


Recovery path

- In recent recessions, rapid rebound for retail
- For C-19, shift to online channels may be persistent, driving store closures

Total impact: 27.5% of pre-recession industry GDP

- 2020 impact: 10.3%
- Longer term impact: 17.2%



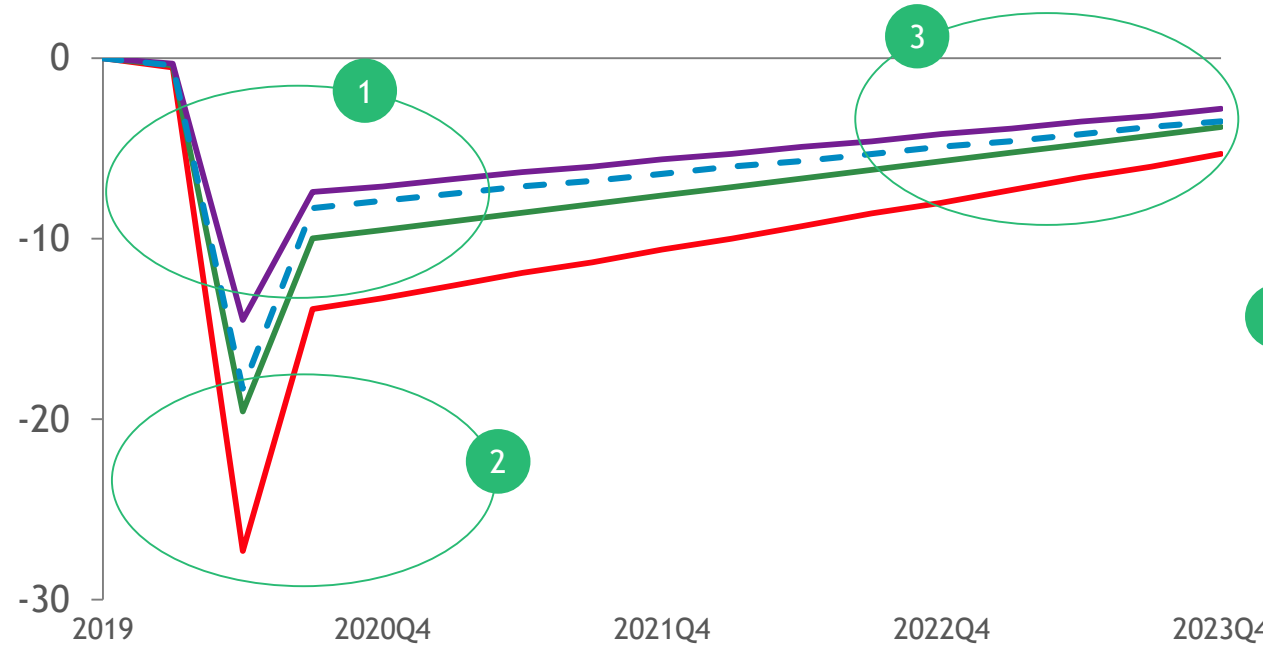
1. Incremental UI claims filed during 3/16-4/19/20 vs same period in 2019
Source: Credit card sales data by Earnest Research. BCG analysis.



Retail expected to see a partial, quick recovery immediately after lockdown, followed by a slower one due to social distancing

- 1
- Essential retailers (food & drugs) are less impacted but total consumption has decreased
 - Non-essential retailers are heavily impacted and take longer time to recover
 - Non-store retailers (online shopping) present the advantage during lockdown

- 2
- Non-essential retailers take longer time to recover, many expected to go out of business
 - Non-store retailers (online) expected to continue growing their market shares post lockdown
 - Essential retailers relatively unaffected by lockdown and subsequent recovery



- 2
- NYC Retailers impacted substantially more due to higher incidence of the epidemic

- 3
- Retail expected to see full recovery over the long-term (2025), mainly driven by boost from non-store retailers, digitalization and recovery of other sectors

— Retail (NYC) — Retail (Rest of NY)
— Retail (Greater NYC) - - - All industries (NYS)

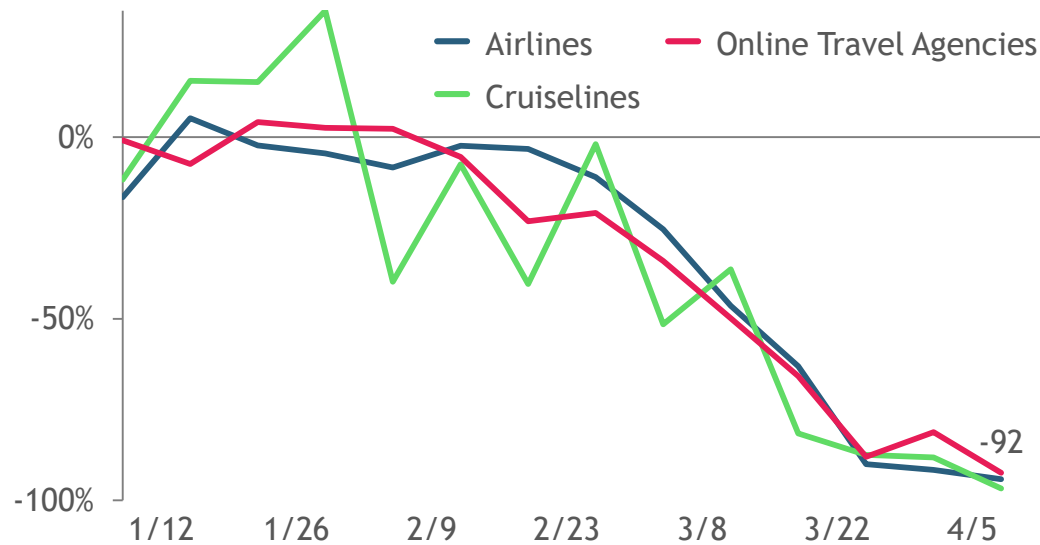


Transportation: Near term impact on revenue and employment followed by slower than average recovery due to social distancing and behavioral changes

Short term impact

- ~90% decline in air travel, 65-80% decline in NY mass transit ridership, 80% decline in rideshare
- +2,201% spike in unemployment claims¹

Credit card sales change YoY in NY State (% , 2019-2020)

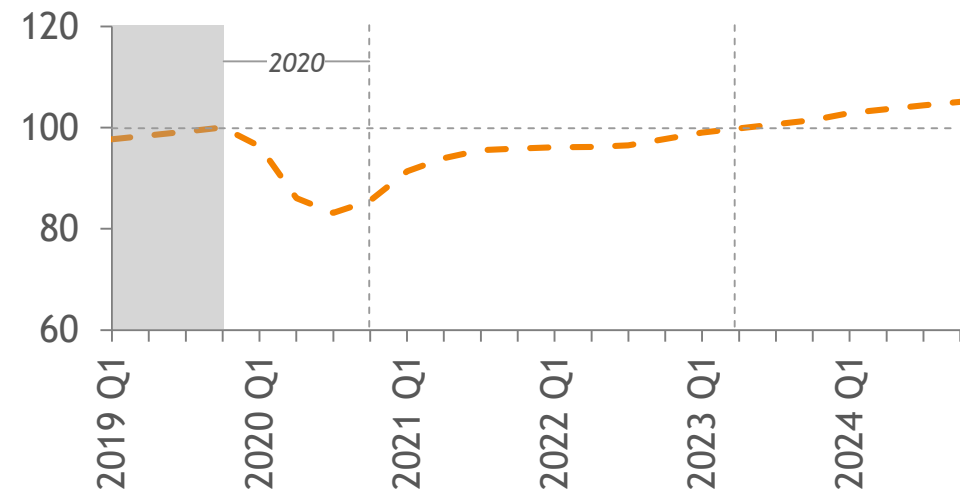


Recovery path

- In recent recessions, recovery in line with avg
- For C-19, likely slower recovery as consumers shift to teleconference vs. in person, and avoid crowded planes / trains

Total impact: 21.7% of pre-recession industry GDP

- 2020 impact: 10.4%
- Longer term impact: 11.3%

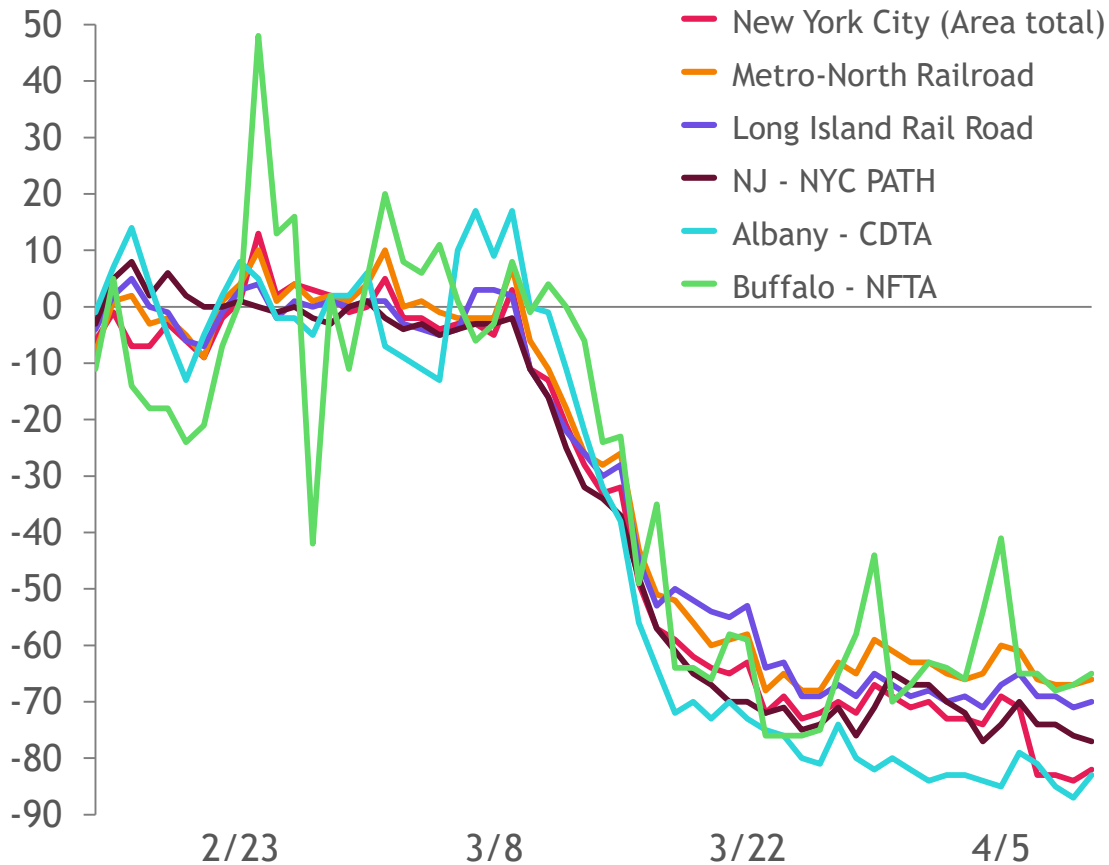


1. Incremental UI claims filed during 3/16-4/19/20 vs same period in 2019
 Source: Credit card sales data by Earnest Research. BCG analysis.

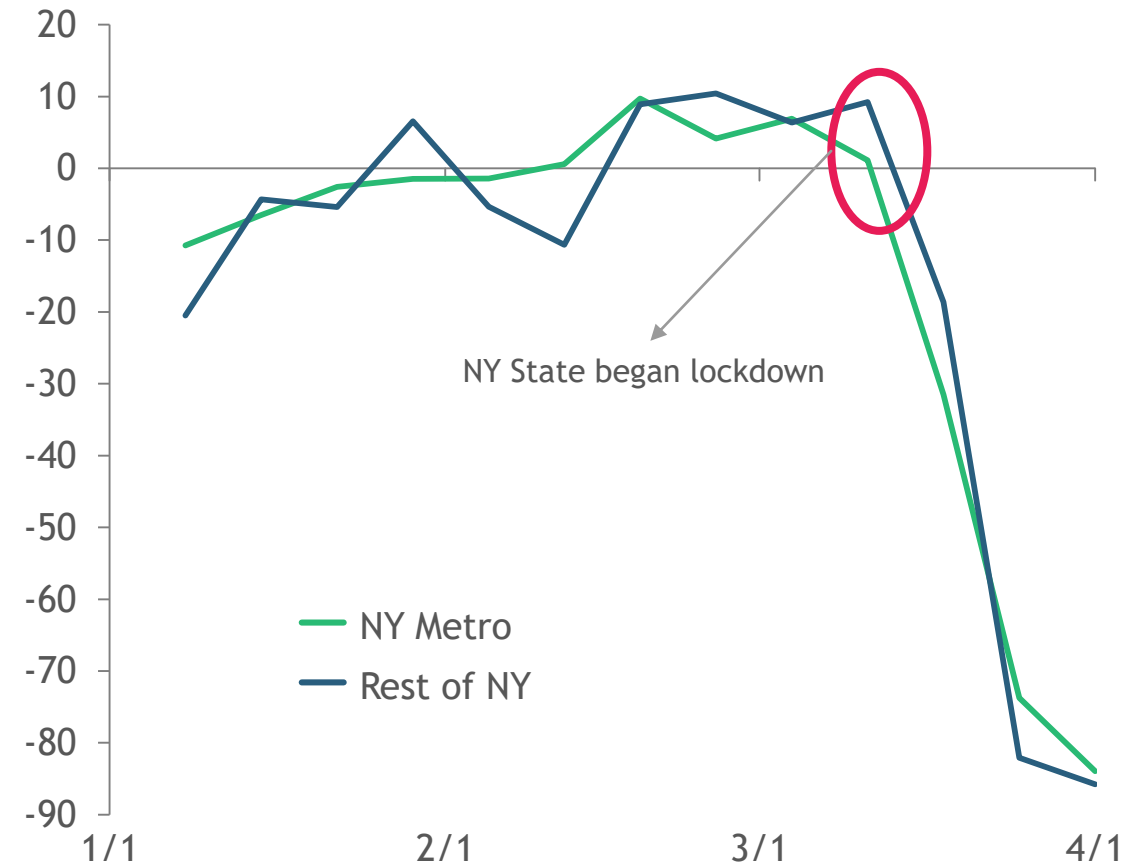


Transportation: Ridership for NY public transportation authorities has declined 65-80% YoY, while rideshare services dropped >80%

Daily ridership for main NY transportation authorities (% - YoY change)



NY rideshare service (% change relative to Mar 2019)



Notes: Ridership data is measured as usage of the "Transit" app, a proxy for demand. Rideshare service based on credit card data from Earnest Research and BCG Analytics.

This analysis represents preliminary findings from a point in time - actual impact could be even more severe

Key assumptions

Short-term impacts

The economy has been deteriorating rapidly, and the pace of deterioration could continue to exceed expectations

Timing of restart

Analysis assumes restart at the beginning of Q3 2020, but depends on continued success putting in place conditions to protect public health

Pace of restart

Significant uncertainty remains about how quickly certain industries, geographies and population segments will return to normal activity

Add'l epidemic waves

Add'l waves (or resurgence due to premature restart) could require new measures like social distancing which could interrupt recovery

Tax structure

Analysis assumes no change to current taxes.

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