



Data Science High Frequency Indicators

TomTom congestion data show impact of global lockdowns

Using TomTom Traffic data, we observe the new baseline in a lockdown world:

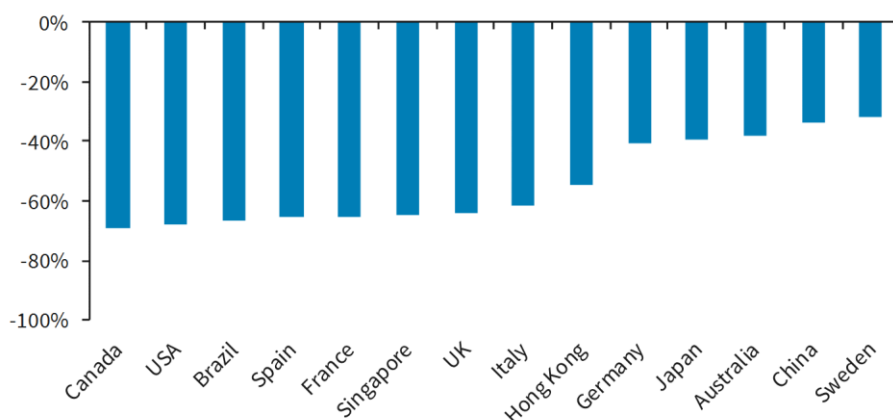
TomTom provides congestion data for 416 global cities as well as historical averages. We believe traffic is a useful proxy for economic activity and personal travel. Comparing live congestion since 21 March to 2019 averages for the same hour of the week, we see major falls in most regions.

As lockdowns ease, is traffic returning in Chinese hotspots? With China beginning to lift the heavy restrictions in movement in its most affected cities, we aim to analyse how the public will react to loosening the lockdowns. We have only just begun to see early signs of an increasing pattern as of Tuesday, 7 April.

Sweden provides a clear contrast: Sweden's light touch approach to lockdowns has been highlighted as a contrast to its neighbours. Indeed, we observe congestion down only 30-45% in Stockholm, with an increasing trend over the past week, in opposition to most European capitals.

FIGURE 1

Average fall in weekday congestion for selected countries worldwide since 21 March compared to the same day of the week in 2019. Note that this is a linear mean of city values which does not weight for population



Source: TomTom International BV, Barclays Research

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INDUSTRY UPDATE

Investment Sciences

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TomTom provides mapping and GPS hardware and software to external parties, including a large proportion of automotive OEMs. As a feature of GPS navigation, routing takes into account traffic patterns versus historical averages. Ultimately TomTom has ‘free flow’ times to pass a section of road, measuring congestion by the additional traversal time versus freeflow.

We utilise TomTom’s traffic congestion indexes for 414 cities in 57 countries. The data consists of a congestion percentage, which we compare to 2019 averages for the same day of the week and hour. We have collected live data since 21 March.

The Traffic index data provides 15-minute live data aggregated on citywide basis. Additionally, for every hour-day-city combination, TomTom provides a calendar year average congestion level. For example, 3pm on Mondays in London (UK) had average congestion of 45% in 2019.

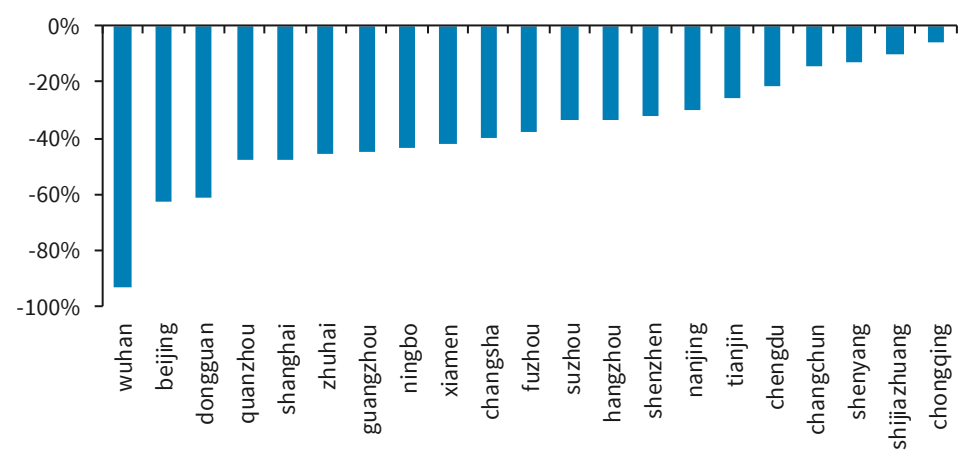
For time series we look at weekdays between 7am and 7pm

To compare to historical data, we compare weekday hourly congestion to the corresponding 2019 value, taking an average between 7am and 7pm local time. A drawback of this approach is that in cities where ‘normal’ congestion is low, the potential for large percentage falls is lower.

China

Across China, we observe a large spread in falling congestion, reflecting how severe the virus’ impact was across the large country. Whilst Wuhan’s congestion has all but disappeared, some other cities saw much smaller effects. This may also reflect some cities with a low 2019 base congestion level.

FIGURE 2
Change in weekday (7am to 7pm) congestion since 21 March vs 2019 day of week average values for Chinese cities

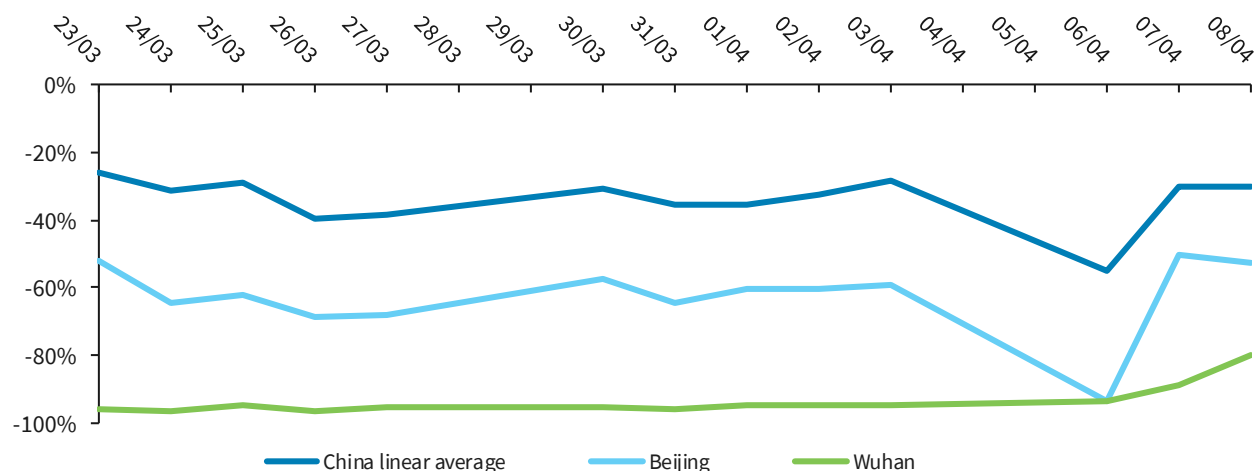


Source: TomTom International BV, Barclays Research

Considering a time series approach, we portray a linear Chinese average in Figure 3, which may overweight the smaller cities. We also show the times series for Beijing and Wuhan. As Wuhan and other Chinese cities begin to ease lockdowns, we look for the rate of recovery in congestion. However, we observe only two days of rises on 7 and 8 April and need more data to spot a sustained pattern. Notably this includes an increase in Wuhan.

FIGURE 3

Time series of weekday (7am to 7pm) congestion vs 2019 day of week average values for Chinese overall¹, Beijing and Wuhan



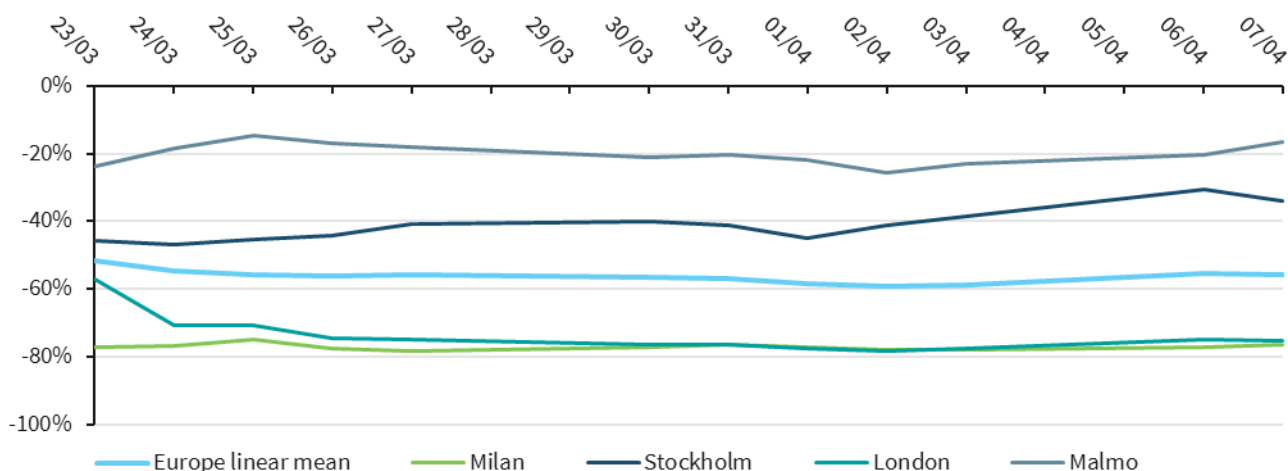
Source: TomTom International BV, Barclays Research

Europe

Across Europe we observe congestion has continued to fall since 21 March, as shown in Figure 4. Variation does occur across cities. Milan, a northern Italian city in which lockdown has been in place since 9 March, has broadly flat congestion. London's congestion was already c55% down before its official lockdown, but has since fallen to 75% under 2019 values.

FIGURE 4

Time series of Weekday (7am to 7pm) congestion vs 2019 day of week average values for four European cities and a linear mean of all European cities monitored by TomTom¹



Source: TomTom International BV, Barclays Research

We contrast these sharp falls with Sweden, which has approached the pandemic with a very light touch so far; it has had no formal lockdown, allowing restaurants and schools to remain open. We observe Malmö's congestion fell by only 10-25%. Stockholm had the most cases in the country and congestion appeared to be rising in the past working week. We

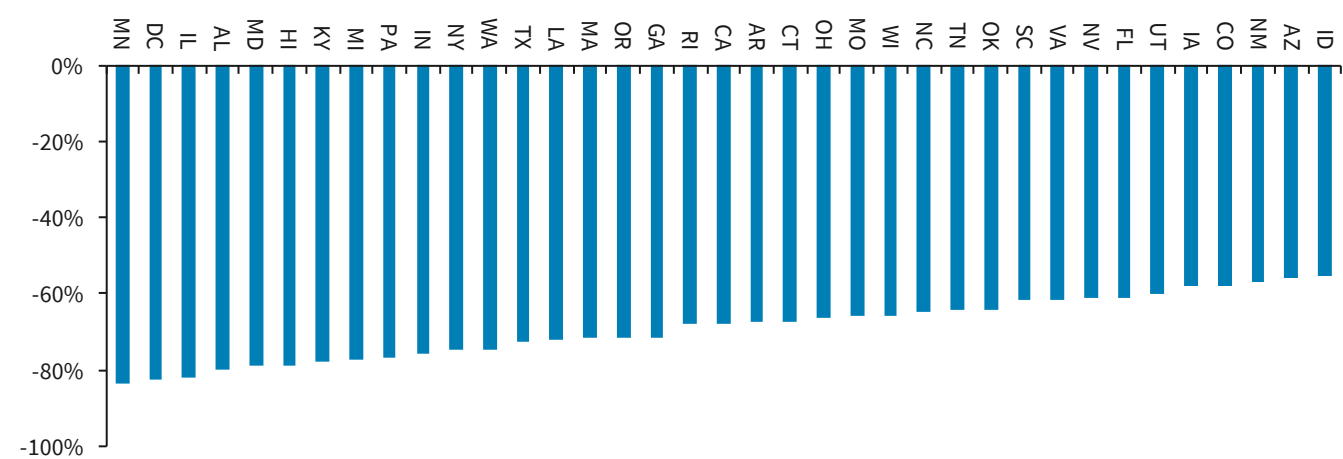
¹ Note that this is a linear mean of city values, which is not weighted for population

note that congestion in Stockholm is low for a large capital city, rated at 27% in the index and ranking 169th of 416 cities. Hence, congestion has a lower base from which to fall.

US by state

Finally, we observe US congestion. The pattern overall looks similar to Europe with a slight delay. Variation occurs across the states, as one would expect with the differing infection levels and responses from state governments. However, even the smallest falls in congestion are approaching 50%. We also note the highest congestion falls are in concentrated, dense cities, where essential travel for groceries can be done locally. The smallest falling areas are less densely packed, which may require more driving for essential travel.

FIGURE 5
State by State Weekday (7am to 7pm) congestion for trailing week vs 2019 day of week average values, grouped by US state¹
Note for IA we omit 3 March due to data issues



Source: TomTom International BV, Barclays Research

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