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Special Commentary

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737 MAX: Impact of Production Cuts & Delivery Stop

Executive Summary

Boeing's decision to halt deliveries and scale back production of its 737 MAX family of aircraft will be a large enough development to move the needle on various gauges of the U.S. economy. The net effect will be a drag on second quarter GDP growth of about two tenths of a percentage point. The major negatives will be slower equipment spending and export growth during the quarter. Those drags will be almost offset by an inventory boost as the undelivered aircraft test storage capacity at production facilities and unused airfields. These dynamics will unwind and potentially *boost* growth in the second half of the year, but that depends on the timing in which business resumes and the MAX is given the all-clear to fly. This report offers a framework for measuring the economic impact of the production cuts and delivery stop while highlighting what to be on the lookout for in coming months with the 737 MAX aircraft.

Production cuts stand to reduce Q2 GDP growth by 0.2 percentage point.

Measuring the Ripple Effects

Due to the long lead times, impact on supply chains and high dollar value of the end product, the aircraft industry can have a large impact on the economy. Recent production cuts and delivery suspensions of Boeing's best-selling aircraft after two fatal crashes are expected to ripple through different economic indicators and line items in the GDP report (Table 1).

Table 1

737 MAX Forecast Impact		
	Q2-2019	Q3-2019
Previous Real GDP Forecast (CAGR)	2.7%	2.2%
Equipment*	-0.1	0.2
Exports*	-0.4	0.5
Inventory*	0.3	-0.6
<i>Change in Real GDP</i>	-0.2	0.1
Adjusted Real GDP Forecast (CAGR)	2.5%	2.3%

*Percentage Point Change due to Production Cut & Delivery Stop

Source: U.S. Department of Commerce and Wells Fargo Securities

First by way of background, it is useful to keep in mind that most of our analysis here focusses on just the 737 MAX, the most recent generation of the world's best-selling aircraft. Since the first shipment in May 2017, Boeing has delivered just 376 of the aircraft in question, though the total number of orders booked is a little over 5,000. Boeing has a substantial backlog of orders as a result, and was previously planning to ramp up production of 737s from 52 to 57 aircraft per month by June of this year. In the wake of the crashes, however, Boeing now plans to cut production of 737s to 42 aircraft per month by mid-April. The company had already announced a suspension of deliveries for the 737 MAX in mid-March.

This report is available on wellsfargo.com/economics and on Bloomberg WFRE.

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The Straight-Forward: Impact to Production and Orders

The grounding and production cuts would first show up in the high-frequency indicators, like industrial production, durable goods orders and shipments. Aircraft and related parts account for only 2.7% of industrial production, but the 737 MAX made up roughly two-thirds of Boeing's deliveries in the past six months. The 20% production cut could therefore shave off 0.3-0.4 percentage point from industrial production growth in April.

Last year, aircraft orders made up almost 10% of all durable goods orders. From 2011 to 2015, orders for the 737 MAX aircraft comprised roughly a third of Boeing orders, though it has become more important since 2016, comprising just under half of all bookings (47% by our estimate).

Considering the 737 MAX aircraft comprised almost half of Boeing's orders in the past few years, the total negative impact on durable goods orders could be substantial if airlines delay new orders until safety concerns are addressed or book with a competitor instead. If Boeing offers steeper discounts on the list price of new contracts, that could also weigh on the total value of durable goods orders, which are measured in nominal terms. Of course, airlines could choose to put in orders for more established models of the 737, which would limit the hit to durable orders.

Cancellations, not just fewer new orders, would also reduce the total value of durable goods orders. The Commerce Department would subtract them from the headline figure in the month in which they occur for the durable goods report. Since the second fatal incident more than a month ago, only one airline has canceled an order, and we remain skeptical that we will see widespread cancellations. Cancellations tend to incur hefty penalties, and multi-year backlogs at Airbus leave airlines looking to expand or upgrade aging fleets few alternatives. A similar situation occurred after a battery problem linked to fires aboard Boeing's 787 Dreamliner caused a grounding of that aircraft from January to April of 2013. Orders still came in during the grounding period and the Dreamliner has subsequently seen steady sales volume.

While orders may still roll in for the 737 MAX, deliveries have been suspended for the time being. As a result, we expect to see the value of durable goods *shipments* dragged down by aircraft as early as the March report (due April 25) until deliveries resume. Shipments receive less attention in the monthly durable goods report since they are less forward-looking than orders, but the spending recorded feeds into GDP, to which we now turn.

The Less Straight-Forward: GDP Lower on Production Cuts

As mentioned previously, Boeing's cut to production of the 737 line of aircraft is not an all-out stop but rather a scaling back by about 20% of its earlier production rate. Still, the high value of these aircraft suggests that even the reduced rate of production will be felt in the broader economy.

The precise impact to our GDP outlook over the remainder of this year depends on a number of factors, including how long Boeing produces at the lower rate, when aviation authorities around the world give airlines the all clear and how quickly Boeing can clear its backlog of shipments. For now, we assume that production of 737s falls from 52 to 42 aircraft per month beginning in mid-April, and then production rebounds to 52 aircraft per month in the third quarter. Based on our discussions with industry analysts about the value of each aircraft after discounts and our subsequent calculations, those cuts stand to reduce Q2 GDP growth by about 0.2 percentage point. While we pencil in a production rebound in the third quarter, the fact that Boeing is unlikely to ramp up production to 57 aircraft per month by the third quarter as was previously planned will keep GDP growth lower in the back half of the year than it otherwise would have been.

Bracing for Big Swings in Equipment, Exports and Inventories

Although topline GDP growth will only be minimally impacted by production cuts, the delivery suspensions are set to ripple through measures of business spending, U.S. exports, and inventories. The halt to shipments of the 737 MAX indicates equipment spending and exports in the second quarter are likely to take a significant hit. In 2018, nearly three-quarters of 737 MAXs were exported overseas, with the remaining purchased by U.S. airlines. We assume that ratio has remained unchanged and that deliveries will remain suspended through the second quarter, but shipments

Orders for the 737 MAX comprise just under half of all bookings.

Delivery suspensions are set to ripple through economic indicators.

will resume in the third quarter. Equipment spending is likely to contract in the second quarter as a result, while the total value of exports is set to plummet.

But with Boeing still producing 42 737s each month, some of which are MAX models, inventories will strain storage capacity at Boeing facilities and result in a bigger inventory build in the GDP accounts. We estimate total inventories could rise as much as \$114 billion annualized in the second quarter, which would provide a bit of an offset to the declines in equipment spending and exports by adding 0.3 percentage point to topline GDP growth. (Table 1).

Shipments will eventually resume once the 737 MAX is given the all-clear to fly again. As the stockpiled aircraft are eventually delivered, inventories will be drawn down, thus generating a drag on GDP growth during the quarter in which that drawdown occurs. The value of equipment and exports, however, would also rebound during that same period. If business were to return fully back to normal in the third quarter, equipment spending and exports would flip to become major positive contributors to GDP growth, while inventories would flip to becoming a significant drag (Table 1).

In reality, the timing of a resolution is unlikely to be so neat. Whether business normalizes in the third quarter, throughout the second half of the year or even beyond will mean the difference between the MAX's return lifting topline growth solely in the third quarter, or a more drawn out effect that does not significantly move the needle in any subsequent quarter. On that basis, the orders and shipments data will take on greater influence as harbingers of activity.

In sum, the delivery stoppage and production slowdown of the 737 MAX will be a drag on production and orders data in the near term, and may subtract as much as two tenths of a percentage point from second quarter GDP growth. When a fix is approved and deliveries resume, we would expect production to also increase and for new orders to pick up. We could see a slight boost to growth in the second half of the year, but the precise timing will depend on how quickly confidence can be restored in the 737 MAX.

The timing of a growth rebound will depend on how quickly confidence is restored.

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