This report is based on forecasts completed at the end of March, and hence does not reflect the further deterioration of economic conditions since then due to the spread of the coronavirus pandemic and significant restrictions on economic activity in many large economies. We will be publishing updated forecasts to the industry databank in early May 2020.
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• Page 3 - Global summary

• Page 4 - US construction machinery outlook

• Page 5 - High-frequency tracking indicators

• Page 6 - Put-in-place construction overview

• Page 7 - Key drivers of sectoral demand

• Page 8 - Key buyers of construction machinery

• Page 9 - Trade outlook

• Page 10 - Global macroeconomic risks

• Page 11 - Appendix

Note: Unless specified, all forecasts represent our baseline view


Forecast highlights

Machinery output to contract in 2020
• The global economic environment is changing rapidly as economies race to put in measures to stem the outbreak. Since this forecast was compiled at the end of March conditions have deteriorated further, especially in the US. Therefore, we expect the outlook for mining and construction machinery will turn out to be weaker than shown in the baseline forecast this report, more likely to be closer to the pandemic scenario on page 10.

• Global mining and construction machinery are set to weaken further in 2020, as growth contracts at an expected pace of 5.3%. Within the developed region, demand from the UK construction sector is down as all non-essential sites have been closed, weighing on an already slow market.

• Japanese demand is struggling on the back of poor prospects in the residential sector and export orders as the outbreak spreads to trading partners. In the US sentiment has dropped and construction activity has fallen, reducing the requirement for additional machinery.

• The emerging markets on the whole is set to be slightly better, with composite growth of -4.7% compared to -7.8% in the developed countries. China is the key drag on growth as the coronavirus cripples activity across most of the country.

• On a more positive note, we still consider an upside risk in terms of an EM upturn as trade wars fear which could renew demand for construction machinery exports. Also, the baseline forecast does feature a rebound in 2021 across both the developed and emerging regions, as pent-up demand and expected government support is implemented.

Growth drivers/constraints
✓ Rising population – raises demand for housing and social facilities and infrastructure, with some economies showing a larger supply and demand imbalance than others such as the UK.
Χ Persistent trade tensions – tariffs remain in place that have raised material costs and raised prices, any additional measures could magnify these adverse impacts.
Χ Coronavirus related disruptions - slow or no activity in the construction sector means they will not require additional machinery for the time being.
US Construction machinery outlook

Overview

• US construction machinery is set to contract -5.5% in 2020, following a 2.4% expansion last year. The construction sector is expected to remain subdued, but with residential the strongest segment as housing benefits from low interest rates. But commercial building is constrained by weak business investment.

• The coronavirus has led to an expectation that non-essential sites will remain closed until summer, reducing the need for capital machinery in all segments of construction. However, we expect some areas of infrastructure will fare a bit better, given that some projects can be classified as essential.

• In terms of the rebound expected in 2021, the sector is in a good position to take advantage of an expected recovery, which should in turn benefit construction machinery. There is a lot of technical work by support services that can be done behind the scenes to support a swift transition back to the construction yard. Furthermore, many private contractors also should be in a good position to resume work quickly, as they are more likely to work alone or in smaller groups.

• Another possibility is that the lockdown could actually help spur a rebound in residential construction in the form of home renovations, depending on how long the lockdown is in place.

• We expect that a lot of ‘mega projects’, especially in the private sector would have been postponed after the expected recession in the manufacturing sector. But a rebound in 2021 should see a good level of these being picked up as they left off, contributing to stronger growth in non-residential buildings.

Global drivers/constraints

✓ Rising number of ‘mega projects’ - ranging from airports, transport to energy related projects should help support a rebound next year as the virus fades away.

✗ Expected closures in construction – due to the coronavirus

✗ Labour shortages - the coronavirus is amplifying the existing labor shortages in construction as lockdowns in states rise.
• **Exchange rate** - a stronger dollar would reduce competitiveness for US produced construction machinery relative to international competitors.

• **Material and oil prices** - higher input prices will increase overall operating costs, negatively impacting profits.

• **Construction backlogs** - larger the backlog the greater the demand for machinery so the sector can fulfil orders, assuming credit-conditions are favorable.

• **Construction spending** - lower spending suggests weaker activity in the industry, reducing demand for related machinery.

• **Stock market share price** - higher share prices indicates stronger confidence in the economy, improving financial ability and willingness to purchase machinery.

• **10-year treasury bond yield** - government issues these to raise capital for infrastructure projects, if demand for the bond is high, the yield will fall.

*If you have any questions, please send them to cparkins@oxfordeconomics.com and they will be addressed in the next webinar*
Put-in-place (PiP) construction - High level overview

**Residential continues to drag**

**Forecast highlights**

- The impact of the Coronavirus has driven our 2020 forecast sharply lower. At the end of March we forecasted negative growth for both Q2 and Q3 in 2020, though followed by strong growth in 2019Q4 and the start of 2020. We expect the effects of the coronavirus to gradually dissipate toward the end of the year, leading to renewed growth as pent-up demand starts to filter through.

- The impact to the construction sector is on both the demand and supply side. On the demand side, the loss of confidence will see new construction investment halt. Consumer demand for homes will reduce significantly as discretionary spending sees the sharpest fall on record. Meanwhile reductions in business spending will drive a curtailment in non-residential expenditures.

- More significantly however, is the disruption to the supply side. The construction sector, already experiencing a shortage of labour, will witness even greater shortfalls to potential labour supply. With restrictions on movements and social distancing becoming increasing practice across the country, the availability of workers for new construction projects will be reduced.

- Furthermore, disruptions within manufacturing sectors that supply material inputs to the construction sector, such as wood products and non-metallic minerals, will also cause delays to construction schedules.

**Growth drivers/constraints**

- Cyclical rebound – following multi-year stagnation in residential, pent-up demand for housing to support sector prospects.
- Ailing infrastructure – creates increased impetus for new investment, though funding constraints will cap growth.
- Supply constraints – labor shortages will restrict growth.
- Public budget deficits - to curtail public investment in infrastructure projects

**Risks/other important points**

- A more prolonged coronavirus outbreak would likely trigger a far more long-lasting recession. If this occurs, we should expect a permanent loss to construction activity as a generalized loss of consumption and investment sees construction demand slashed.

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**US: Put in Place (PiP) data**

<table>
<thead>
<tr>
<th></th>
<th>2019 levels*</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024-28</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total PiP construction**</td>
<td>1,306,806</td>
<td>-0.1</td>
<td>0.7</td>
<td>5.5</td>
<td>5.0</td>
<td>4.5</td>
<td>3.6</td>
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<tr>
<td>Private PiP construction</td>
<td>977,736</td>
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<td>6.5</td>
<td>5.6</td>
<td>4.9</td>
<td>3.8</td>
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<tr>
<td>State &amp; local PiP construction</td>
<td>305,255</td>
<td>6.9</td>
<td>0.8</td>
<td>2.6</td>
<td>3.5</td>
<td>3.3</td>
<td>2.8</td>
</tr>
<tr>
<td>Federal PiP construction</td>
<td>23,815</td>
<td>11.8</td>
<td>8.8</td>
<td>1.9</td>
<td>0.3</td>
<td>-0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Population (mns)</td>
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<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.4</td>
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<tr>
<td>30 year mortgage rate (%)</td>
<td>6.0</td>
<td>3.9</td>
<td>3.9</td>
<td>3.3</td>
<td>3.6</td>
<td>3.9</td>
<td>2.6</td>
</tr>
</tbody>
</table>

*Levels in US$mns, nominal - current prices
**Sum of private and public PiP construction

---

**US: Residential put-in-place**

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<td>Private PiP</td>
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<td>7.2</td>
<td>7.1</td>
<td>7.0</td>
<td>6.9</td>
<td>6.8</td>
<td>7.2</td>
<td>7.1</td>
<td>7.0</td>
<td>6.9</td>
<td>6.8</td>
<td>7.2</td>
<td>6.9</td>
<td>7.1</td>
<td>7.0</td>
<td>6.9</td>
<td>6.8</td>
<td>7.2</td>
</tr>
<tr>
<td>State and local PiP</td>
<td>9.8</td>
<td>9.5</td>
<td>9.6</td>
<td>9.9</td>
<td>9.8</td>
<td>9.7</td>
<td>9.6</td>
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<td>9.6</td>
<td>9.8</td>
<td>9.7</td>
<td>9.6</td>
<td>9.5</td>
<td>9.9</td>
</tr>
</tbody>
</table>

Source: Oxford Economics/Haver Analytics
### Core component | NAICS code | Examples
--- | --- | ---
Construction machinery | 33312 | Bulldozers, chippers, cranes, excavators, surface mining machinery, tractors, tree harvesting equipment

### Key macro drivers
- **Construction machinery output demand is primarily driven by investment spending in capital intensive industries** such as construction, also mining, especially minerals and stone. Also, several areas of business services, such as retail & wholesale distribution and equipment leasing.
- **Demand is cyclical**, reflecting the volatility of investment (one of the most volatile components of GDP), also the volatility in the construction industry itself.
- Construction, and in turn in demand for construction machinery, is also driven by credit conditions, public investment in infrastructure, and population demographics.
- Construction machinery is trade-intensive, and so **demand is typically correlated with exports**, highlighting the importance of exchange rates in determining competitiveness.
Key buyers of construction machinery

Overview

- Output from construction machinery manufacturers is typically purchased from businesses in the form of their operating expenditures (OpEx) or investment spending (CapEx). Other demand comes from governments, also exports abroad and stock building. Supply is supplemented by imports from other countries.
- In 2017, demand featured:
  - Exports: $13,283mn
  - Imports: $17,815mn
  - Investment (CapEx):
    - Tractors for Construction: $6,814mn
    - Machinery for Construction: $37,429mn
  - Purchases of inputs and supplies (OpEx): $4bn

US: Real gross output for "OpEx buyers" of construction machinery

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<tr>
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</thead>
<tbody>
<tr>
<td>Oil and gas extraction</td>
<td>211</td>
<td>457.0</td>
<td>15.6</td>
<td>10.2</td>
<td>-0.4</td>
<td>1.7</td>
<td>1.2</td>
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<tr>
<td>Other residential structures</td>
<td>2332B</td>
<td>222.4</td>
<td>1.3</td>
<td>6.9</td>
<td>3.1</td>
<td>1.5</td>
<td>-0.3</td>
</tr>
<tr>
<td>Support activities for mining</td>
<td>213</td>
<td>84.9</td>
<td>17.0</td>
<td>-10.3</td>
<td>-16.2</td>
<td>0.3</td>
<td>-0.1</td>
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<tr>
<td>Coal mining</td>
<td>2121</td>
<td>37.3</td>
<td>-6.0</td>
<td>-5.6</td>
<td>-9.8</td>
<td>-3.2</td>
<td>-2.4</td>
</tr>
<tr>
<td>Mineral, stone &amp; other mining</td>
<td>2123</td>
<td>37.7</td>
<td>8.2</td>
<td>4.2</td>
<td>-0.9</td>
<td>1.3</td>
<td>1.3</td>
</tr>
<tr>
<td>Metal ore mining</td>
<td>2222</td>
<td>34.3</td>
<td>-5.5</td>
<td>0.0</td>
<td>-2.5</td>
<td>1.4</td>
<td>1.2</td>
</tr>
</tbody>
</table>

*Levels in US$bn, 2012 prices, real, inflation adjusted basis

US: Real gross output for "CapEx buyers" of construction machinery

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Retail &amp; wholesale distribution</td>
<td>42</td>
<td>1830.5</td>
<td>3.3</td>
<td>-0.2</td>
<td>-1.4</td>
<td>4.9</td>
<td>1.4</td>
</tr>
<tr>
<td>Construction</td>
<td>23</td>
<td>1357.2</td>
<td>-0.4</td>
<td>-0.1</td>
<td>0.5</td>
<td>3.6</td>
<td>2.0</td>
</tr>
<tr>
<td>Admin and support services</td>
<td>561</td>
<td>843.2</td>
<td>6.5</td>
<td>2.0</td>
<td>1.4</td>
<td>4.9</td>
<td>2.0</td>
</tr>
<tr>
<td>Rental and leasing services</td>
<td>532, 533</td>
<td>324.3</td>
<td>1.0</td>
<td>2.4</td>
<td>0.6</td>
<td>3.4</td>
<td>1.5</td>
</tr>
<tr>
<td>Non metallic minerals</td>
<td>327</td>
<td>112.0</td>
<td>-0.1</td>
<td>2.0</td>
<td>-0.6</td>
<td>4.5</td>
<td>-1.3</td>
</tr>
<tr>
<td>Extraction excluding oil</td>
<td>212</td>
<td>110.4</td>
<td>-0.2</td>
<td>-0.2</td>
<td>-4.1</td>
<td>0.0</td>
<td>0.2</td>
</tr>
</tbody>
</table>

*Levels in US$bn, 2012 prices, real, inflation adjusted basis
Outlook headline

- The US produced an estimated $34.9bn (in nominal terms) worth of construction machinery in 2019 and exported one-third of this output. The majority of these were sent to Canada, Australia and Mexico.

- Demand for construction equipment is now expected to be poor this year, as value-added and investment in the sector declines. As of the end of March, construction sites in some regions, but not others. But on the whole, activity levels are likely to remain below the level that would require additional investment in machinery, either produced domestically or imported from the US, given the negative investor sentiment associated with recessions.

- Prospects in Australia are similarly weak with construction investment falling by nearly 4% so far this year. The coronavirus pandemic has led to weaker prospects across industries and with business investment already subdued going into 2020, the virus outbreak will put a further drag on capital expenditure in the economy and within construction.

- A double-digit contraction in Mexican construction investment does not bode well for demand for US agricultural machinery. Coronavirus related industry lockdowns and falling consumer spending will weigh on private sector investor sentiment. But a lot of the recovery will be dependent on prospects in the US and the impact of domestic relief packages.
Global macroeconomic risks

<table>
<thead>
<tr>
<th>Scenario and assumptions</th>
<th>Probability</th>
<th>Impact on growth*</th>
<th>Transmission</th>
<th>Impact on construction machinery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coronavirus pandemic - impact on labour supply, expenditure and financial markets occurs in the first six months. Production, tourism, discretionary spending and investment are set to weaken further.</td>
<td>N/A - special scenario</td>
<td>Baseline: 2020: -5.3%, 2021: 6%</td>
<td>Production levels in key industries drop, supply and demand disruptions occur and capital expenditure plans get scaled back of postponed.</td>
<td>Closures of construction sites and supply chain disruptions to building materials will weigh on activity this year. So existing capital machinery will largely be sufficient for what necessary construction is still going ahead, therefore demand and output of relevant machinery is set to drop.</td>
</tr>
<tr>
<td>EM growth falters - the slowdown takes hold as confidence worsens in coronavirus-hit China, at the same time as structural deficiencies hinder productivity gains in vulnerable EM markets.</td>
<td>10%**</td>
<td>Baseline: 2020: -5.3%, 2021: 6%</td>
<td>Investment decisions are postponed on the back of weaker confidence and weaker Chinese demand reduces import demand from trading partners.</td>
<td>Weaker investment in China will weigh further on demand for US construction equipment as projects get delayed or cancelled in an environment where the country is trying to move away from heavy industry.</td>
</tr>
<tr>
<td>Global recession - further weakness in industry spills over to services against a backdrop of coronavirus-related disruption, falling confidence, deteriorating labour market conditions and marked commodity and asset price falls.</td>
<td>25%**</td>
<td>Baseline: 2020: -5.3%, 2021: 6%</td>
<td>Weaker confidence weighs on capex and as sentiment deteriorates, borrowing rates become higher. A stronger dollar makes US exports less competitive relative to Europe.</td>
<td>A slowdown in GDP and manufacturing across the world will reduce overall activity in the construction sector. But, it will be largely concentrated in non-residential buildings as companies face higher borrowing costs and lower demand so expansion plans will be put on hold or cancelled.</td>
</tr>
<tr>
<td>Global trade war - the apparent improvement in trade relations proving fleeting, President Trump implements major new trade policy measures against China, Mexico and all other major trading partners.</td>
<td>5%**</td>
<td>Baseline: 2020: -5.3%, 2021: 6%</td>
<td>Higher tariffs directly hit exports and investment expenditure. A fall in confidence weighs on investment decisions and a stronger dollar weighs on US competitiveness.</td>
<td>US and global investment decisions will be postponed or cancelled on the back of weaker private sector confidence, so construction activity is likely to drop, reducing demand for related US machinery. In the US, demand from residential will be disproportionately hit compared to others</td>
</tr>
<tr>
<td>Weaker corporate profits tips US into recession - the late-cycle US economy weakens markedly against the backdrop of falling corporate profits, falling confidence and substantial asset price falls.</td>
<td>20%**</td>
<td>Baseline: 2020: -5.3%, 2021: 6%</td>
<td>Corporate profits fall further as weaker business confidence exacerbates the slowdown in demand. Higher risk premia raises the cost of credit-driven capex.</td>
<td>Despite an initial drop in US interest rates, firms are likely to postpone or cancel large construction projects as the risk of making a return drops. For instance, if the high-rise non-residential building is completed, under these circumstances it is unlikely to be fully occupied.</td>
</tr>
<tr>
<td>EM upturn as trade war fears fade - EM's benefit from a further loosening of policy in China, swift roll-back of past tariff hikes and a supportive monetary policy among advanced economies.</td>
<td>15%**</td>
<td>Baseline: 2020: -5.3%, 2021: 6%</td>
<td>Lower tariffs directly boost exports and investment expenditure by lowering the price of imported capital goods and raising the return on investment.</td>
<td>Stronger demand in emerging markets such as China will have a positive effect on exports of US construction machinery. Construction projects are likely to be brought forward on the back of stronger confidence, this could cause a surge in machinery demand, depending on the volume of projects, positively affecting output growth.</td>
</tr>
</tbody>
</table>

*Annual growth rates for baseline and scenario represent inflation adjusted output for the sector composite of equipment manufactured for construction and mining, quarrying

**Weights will be updated to fully account for the coronavirus pandemic in Q2

If you’d like to discuss a more bespoke forecast specific to your organization please contact: nickstavropoulos@oxfordeconomics.com
Appendix

Data overview

Construction put-in-place (PiP)

• Construction put-in-place measures the total spending on construction, including spending on intermediate goods e.g. money spent on cement, wood or ready-to-fit appliances. The data and forecasts are listed in nominal terms, consistent with the Census Bureau.

• It is calculated as the value of the work carried out on projects during the inquiry period plus the value of work done under the construction period, minus the value at the beginning of the period. Accounting for work done as a main contractor and sub-contractor.

• When it comes to reporting a construction project, if it were to start in 2019 and take 3 years to complete, the PiP data would divide up the project work over the 3-year lifespan of the project. So, all the construction activity that occurred on the housing complex in 2019 would be listed in the 2019 put-in-place data, ditto for 2020 and 2021. Unlike housing starts data which front-loads all construction spending at the period that construction begins.

Construction GVA

• GVA measures value-added by the construction sector. Unlike construction put-in-place, it removes any intermediate spending such as on building materials so it is consistent with GDP. So the sum of the economy’s GVA is equal to GDP (minus a very small correction for taxes and subsidies).

• In contrast to PiP, which is measured “nominal” terms (i.e. including the growth impact of price increases), GVA is presented as inflation-adjusted or “real” data (i.e. removing the growth impact due to price increases. It thus expresses changes in volume terms. Because prices are rising, growth forecasts for GVA will typically be lower than the forecasts for put-in-place construction, although definitional differences mean this will not always be the case.

• The construction data also has a nominal variant, which uses the real equivalent and a price deflator. This is more consistent with growth rates of the PiP data, although definitional differences will mean that the growth rates won’t necessarily be identical.

Construction gross output

• Gross output is a measure of sales or revenue from output in the construction sector, and is hence a good indicator of market size.

• It is typically presented in nominal terms, but can be converted to show a real equivalent by using a price deflator.

<table>
<thead>
<tr>
<th>US Construction (NAICS 23) - Forecast overview</th>
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<tbody>
<tr>
<td>Annual % change (unless specified)</td>
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<tr>
<td></td>
</tr>
<tr>
<td>Total PiP (nominal US$)</td>
</tr>
<tr>
<td>GVA (nominal US$)</td>
</tr>
<tr>
<td>Gross output (nominal US$)</td>
</tr>
<tr>
<td>GVA (real inflation-adjusted 2012 prices)</td>
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<tr>
<td>GVA price deflator (2012=1)</td>
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</table>

Contact: Chloe Parkins | Economist | cparkins@oxfordeconomics.com