Atradius
Managing risk, enabling trade

November 2018

market monitor

Focus on machines/engineering performance and outlook

Disclaimer

In this issue...

On the following pages we indicate the general outlook for each sector featured using these symbols:

Excellent
The credit risk situation in the sector is strong / business performance in the sector is strong compared to its long-term trend

Good
The credit risk situation in the sector is benign / business performance in the sector is above its long-term trend

Fair
The credit risk situation in the sector is average / business performance in the sector is stable

Poor
The credit risk in the sector is relatively high / business performance in the sector is below its long-term trend

Bleak
The credit risk in the sector is poor / business performance in the sector is weak compared to its long-term trend

Challenges and opportunities

The short-term outlook for the machines/engineering industry in most countries covered by this Market Monitor issue remains 'Good' or 'Fair' for the time being. Machinery businesses related to manufacturing benefit from increased investments, and demand from the construction industry is stable in many markets. However, many machinery businesses related to the oil and gas sector remain affected by the sluggish rebound of investment in the energy industry.

As a cyclical and capital-intensive industry, machines/engineering is highly sensitive to changes in the priorities and budgets of end-market customers. The sector is highly exposed to geopolitical uncertainty and volatility in worldwide economic conditions, including the threat of rising protectionism and higher trade barriers.

The need to adapt to new technologies increasingly create opportunities for the global machinery/engineering industry. However there are also challenges, especially for businesses that lack the skills/expertise and/or the financial means to climb up the value chain. Additive manufacturing (also known as 3D printing) technologies are increasingly being adopted in commercial engineering environments. Robotics and plant automation are becoming both increasingly advanced and widely adopted. The increasing spread of the Internet of Things (IoT) is likely to have a major impact on the engineering production process. With the IoT, factories will be able to internetwork devices and equipment, increasing productivity and efficiency considerably.

China

- Positive developments in 2017 and 2018, but challenges ahead
- Average payment duration of 90-150 days
- Financial troubles for smaller businesses as banks are reluctant to lend

Overview

Credit risk assessment	significantly improving	improving	stable	deteriorating	significantly deteriorating
Trend in non-payments over the last 6 months			✔		
Development of non-payments over the coming 6 months			✔		
Trend in insolvencies over the last 6 months			✔		
Development of insolvencies over the coming 6 months			✔		
Financing conditions	**very high**	**high**	**average**	**low**	**very low**
Dependence on bank finance		✔			
Overall indebtedness of the sector		✔			
Willingness of banks to provide credit to this sector			✔		
Business conditions	**significantly improving**	**improving**	**stable**	**deteriorating**	**significantly deteriorating**
Profit margins: general trend over the last 12 months				✔	
General demand situation (sales)			✔		

Source: Atradius

China's machinery sector expanded steadily in 2017, driven largely by accelerated industrial upgrading and economic growth. Revenues increased 9.5%, up to CNY 24.54 trillion (EUR 3 trillion). Machinery imports increased 12% to USD 306 billion (EUR 258 billion) while exports grew 8.3% to USD 406 billion (EUR 343 billion). Investment in the machinery sector increased 2.6% to CNY 5.14 trillion (EUR 648 billion) in 2017, marking the end of a deceleration seen in the previous five years. In 2018 production and revenue growth continued, albeit at a slower pace. Added value grew 8.4% in H1 of 2018).

More than 70% of the sector's major subsectors recorded output increases in 2017, especially products related to China's infrastructure development (production of digging machines surged 70% as urbanisation picked up in pace), consumer market and logistics service. That said, agricultural machinery (tractors, harvesters) and power generation equipment output decreased and demand from traditional downstream industries (metallurgy and coal) declined. The Chinese government has recently launched a series of favourable policies to promote the development of its manufacturing industry, which will also benefit the machinery sector. The strategic "Made in China 2025" program encourages enterprises to use high-end machine tools (still there is an oversupply of low-end machinery products but short supply of high-end ones). The government's implementation of comprehensive tax cuts for productive enterprises also provides support for machinery manufacturers.

However, there are substantial challenges ahead. Profit margins of machinery businesses decreased in 2017 and in H1 of 2018 due to sharply increased input costs (up 10% in 2017 and H1 of 2018) for raw materials, labour, transport and financing, while sales prices remained stable. Interest expenses of machinery businesses increased 15.4% in H1 of 2018, exceeding the 6.7% growth in profit ratios. Both large investments in fixed assets and large accounts receivables are the main reasons for high

China: Engineering

	2017	2018f	2019f
GDP growth (%)	6.9	6.5	6.1
Sector value added growth (%)	11.0	8.3	3.8

Average sector growth over the past 3 years (%)	6.8
Average sector growth over the past 5 years (%)	7.6
Degree of export orientation	medium
Degree of competition	high

Sources: Macrobond, Oxford Economics, Atradius

debt ratios in the industry. In H1 of 2018 accounts receivables of machinery businesses increased 12% year-on-year, to CNY 4.67 trillion (EUR 589 billion), accounting for one third of total accounts receivables of all Chinese industries. At the same time, Chinese banks are increasingly reluctant to lend, due to a large amount of non-performing loans accumulated in recent years and the economic slowdown. This less favourable lending policy mainly affects privately-owned small and medium-sized businesses. If bank loans are provided, additional security is usually required, such as fixed assets and personal property guarantees.

China's infrastructure development, as a key driver for China's construction-related machinery segment, could be negatively affected by tighter supervision of public-private partnership (PPP) projects. At the same time, the ongoing Sino-US trade dispute has increased economic uncertainty. Chinese machinery deliveries to the US amounted to USD 110 billion (EUR 93 billion) in 2017, accounting for 27% of total Chinese machinery exports. However, the direct impact of US punitive tariffs on the industry should be limited, as the amount of exports to the US accounts for just 3% of total Chinese machinery revenues, of which only 50% would be affected by additional tariffs. Despite this, a further escalation of the trade dispute could adversely affect major domestic buyer industries of machines.

Taking into account both opportunities and challenges, we expect machinery production and revenue to grow at about 7% in 2018. The average payment duration in the Chinese machinery industry is between 90-150 days. As credit conditions have been tightened some smaller and/or privately owned machinery businesses could face liquidity issues, leading to slower payments and even payment defaults. However, no major increase in payment delays or insolvencies in the machinery sector is expected in the coming 12 months.

Our underwriting stance is generally neutral, but differs according to the performance of buyer industries, i.e. we are open for automotive-related machinery, neutral on electric-, construction-, and agriculture-related machinery, and restrictive on oil/gas- and mining-related machinery segments.

Performance forecast along subsectors

Machinery related to manufacturing	Machinery related to construction	Machinery related to oil/gas
		

Source: Atradius

Chinese machinery sector

Strengths	Steady expansion of China's machinery sector in 2017 and H1 of 2018
	Government policies promote the development of machinery production
Weaknesses	Sluggish demand has not fully recovered in some traditional downstream industries
	Squeezed margins due to sharply increased input cost
	Bank financing is expensive and difficult to obtain, especially for SMEs

Source: Atradius

France

- Solid growth in most segments
- Payments take 60-70 days on average
- Difficulty hiring skilled staff is an issue

Overview

Credit risk assessment	significantly improving	improving	stable	deteriorating	significantly deteriorating
Trend in non-payments over the last 6 months			✔		
Development of non-payments over the coming 6 months			✔		
Trend in insolvencies over the last 6 months		✔			
Development of insolvencies over the coming 6 months			✔		
Financing conditions	**very high**	**high**	**average**	**low**	**very low**
Dependence on bank finance		✔			
Overall indebtedness of the sector		✔			
Willingness of banks to provide credit to this sector		✔			
Business conditions	**significantly improving**	**improving**	**stable**	**deteriorating**	**significantly deteriorating**
Profit margins: general trend over the last 12 months			✔		
General demand situation (sales)		✔			

Source: Atradius

After good performance in 2016, French machinery sales grew 2.3% in 2017 mainly due to growth in exports, with Germany as the main destination. In H1 of 2018 machinery sales (domestic and export) increased 8.6%. The outlook for H2 of 2018 and 2019 remains positive, as both production and demand continue to grow.

The manufacturing-related machinery segment is driven by increased investment by automotive, aircraft and chemical businesses, both domestic and abroad. Domestic demand remains dynamic, with more investment by the manufacturing sector in modernising production sites ("Industry 4.0"). Sales of industrial robots increased 29% year-on-year in 2017. Order books of the manufacturing-related machinery segment are well filled (more than three months).

The construction related machinery segment recorded 11% growth in activity last year, driven by the lifting and handling equipment segment (up 13.6%). The outlook for the coming months remains stable for the time being; however, there are indications that the rebound in construction activity has already reached its peak.

Machinery businesses related to agriculture/farming showed a modest rebound in 2017 after decreasing sales in 2016. However, sales growth is forecast to pick up in 2018 (up 8%) and margins are about to increase, due to higher demand from farmers and higher prices.

The boiling and piping equipment machinery segment, which is highly dependent on the oil and gas industry, is still suffering from low demand coupled with higher raw material prices.

In the capital-intensive machinery industry financing needs are high. As a result, businesses in this sector can incur large debts that weaken their financial structure and overall solvency, put-

France: Engineering

	2017	2018f	2019f
GDP growth (%)	2.3	1.6	1.7
Sector value added growth (%)	1.1	2.4	1.2

Average sector growth over the past 3 years (%)	0.0
Average sector growth over the past 5 years (%)	0.2
Degree of export orientation	high
Degree of competition	high

Sources: Macrobond, Oxford Economics, Atradius

ting undue stress on liquidity. However, in many cases advance payments, along with increased use of factoring contracts, can improve suppliers' cash situations. Additionally, banks are willing to lend to the machinery sector for investment through leasing or long-term loans. In the current situation many machinery producers are under pressure to either expand/grow (which requires additional investment) or refuse orders. Current difficulties hiring skilled staff is a real issue, impacting further business expansion.

Profit margins of machinery businesses have increased over the last 12 months due to the benign business environment, but could decrease slightly in the coming months due to higher prices of metals and energy and because capacity issues have led to increased use of subcontractors.

French machines/engineering sector

Strengths
Leadership in some key products
Technical knowledge
Good worldwide position (France is the 6th largest player)

Weaknesses
High financial needs
Dependency on export markets
Still low level of robotics and 4.0 industry equipment
Lack of skilled staff

Source: Atradius

On average, payments in the French machinery sector take 60-70 days, and payment duration has been decreasing. The level of protracted payments has been low over recent years. In H1 of 2018 non-payment notifications remained stable at a rather low level, and no deterioration is expected in the coming six months. Insolvencies decreased about 8% in H1 of 2018, but we expect this trend to level off in H2 and in early 2019.

In view of the current performance and positive outlook, our underwriting stance remains open for most segments. However, we are still cautious with machinery businesses dependent on the oil and gas sector, which are still facing low demand and are often highly leveraged.

Performance forecast along subsectors

Machinery related to manufacturing	Machinery related to agriculture	Machinery related to oil/gas
		

Source: Atradius

Italy

- **Lower growth in 2018 and 2019 expected**
- **Payments take 110 days on average**
- **Still subdued performance in the construction-related segment**

Overview

Credit risk assessment	significantly improving	improving	stable	deteriorating	significantly deteriorating
Trend in non-payments over the last 6 months			✔		
Development of non-payments over the coming 6 months			✔		
Trend in insolvencies over the last 6 months			✔		
Development of insolvencies over the coming 6 months			✔		
Financing conditions	**very high**	**high**	**average**	**low**	**very low**
Dependence on bank finance			✔		
Overall indebtedness of the sector			✔		
Willingness of banks to provide credit to this sector			✔		
Business conditions	**significantly improving**	**improving**	**stable**	**deteriorating**	**significantly deteriorating**
Profit margins: general trend over the last 12 months		✔			
General demand situation (sales)		✔			

Source: Atradius

The Italian machines/engineering sector has proved to be relatively resilient during the downturn in Italy´s economic performance after 2008, due to its export orientation, high specialisation and added-value products in precision mechanics. Value added growth of the industry rose by about 5% in 2017, but the increase is expected to slow down in 2018 (up 2.7%) and 2019 (up 0.9%), in line with lower economic growth.

As in previous years, competition remains strong in the domestic market, especially among small and medium-sized machinery companies dependent on construction businesses. While domestic capital investment growth has picked up again since 2016, performance of the construction and road machinery segment is still hampered by the slow construction rebound in Italy. The earthmoving machinery segment is highly dependent on public works and therefore exposed to structurally slow payments by public entities. At the same time, demand for machinery related to the oil and gas sector remains subdued, as investments have declined during the period of low oil prices, and have not rebounded yet.

In contrast, the machinery segment dependent on the manufacturing sector continues to benefit from export growth and increased domestic market demand (especially from the automotive and food sectors). Larger and more diversified machinery companies and export-oriented SMEs are expected to improve performance and cash generation. Machinery businesses related to agriculture and food have performed well in 2018, but sales are expected to decrease slightly in 2019.

Overall profit margins of machinery businesses are rather high compared to other Italian industries, and are expected to improve further in the coming 12 months, at least in the growing subsectors. As in 2017, payment duration in the Italian machinery sector is still 110 days on average. Payment experience has been good over the past two years, and the level of protracted pay-

Italy: Engineering

	2017	2018f	2019f
GDP growth (%)	1.6	1.2	1.3
Sector value added growth (%)	4.9	2.7	0.9

Average sector growth over the past 3 years (%)	3.3
Average sector growth over the past 5 years (%)	1.1
Degree of export orientation	high
Degree of competition	high

Sources: Macrobond, Oxford Economics, Atradius

ments is low. Non-payment notifications have been stable over the last 12 months, and are expected to remain low in the coming months. The number of insolvencies in the machinery sector is relatively low, and expected to level off or even to decrease slightly in 2019.

Italian machines/engineering sector

Strengths	Significant specialisation and technological know-how
	Export orientation and good geographical diversification in end markets
	Large engineering corporates usually have sound financials
Weaknesses	Many small companies
	Low investments in the oil/gas market
	Low bargaining power of smaller businesses

Source: Atradius

Our underwriting approach remains generally open, especially for larger businesses and niche export-focused subsectors (e.g. high precision mechanical works). Those businesses usually show solid financials and a good liquidity profile. However, we are still more cautious about companies operating in still difficult end-sectors (e.g. construction) and which are dependent on public entities. We also closely monitor machinery businesses that produce components and plants for the oil and gas sector.

Performance forecast along subsectors

Machinery related to manufacturing	Machinery related to construction	Machinery related to agriculture
		

Source: Atradius

United Kingdom

- **Payment duration is about 90 days on average**
- **A modest increase in insolvencies expected in 2019**
- **The true implications of Brexit remain to be seen**

Overview

Credit risk assessment	significantly improving	improving	stable	deteriorating	significantly deteriorating
Trend in non-payments over the last 6 months			✔		
Development of non-payments over the coming 6 months			✔		
Trend in insolvencies over the last 6 months			✔		
Development of insolvencies over the coming 6 months				✔	
Financing conditions	**very high**	**high**	**average**	**low**	**very low**
Dependence on bank finance	✔				
Overall indebtedness of the sector	✔				
Willingness of banks to provide credit to this sector		✔			
Business conditions	**significantly improving**	**improving**	**stable**	**deteriorating**	**significantly deteriorating**
Profit margins: general trend over the last 12 months				✔	
General demand situation (sales)			✔		

Source: Atradius

The British machinery/engineering sector has performed quite well in 2017 and in early 2018, mainly driven by domestic demand. Higher orders have led to increased work backlogs, and buyers from the manufacturing sector have expanded capacity, leading to an improved capital spending environment. Export-oriented British machinery businesses have benefitted from the weakness of the GBP following the Brexit decision in June 2016, recording higher demand and activity. However, at the same time price pressures have remained elevated due to increased import costs for commodities.

UK economic growth has started to slow down in H1 of 2018, as Brexit uncertainty continues to weigh on business investment. Additionally a tighter fiscal stance and higher interest rates will drag on growth. It is expected that the bulk of British machinery businesses, whose revenue is generated mainly in the domestic market, will be impacted by slower economic growth and lower capital investments in 2019. UK engineering value added growth is forecast to slow down to 0.7% next year.

In the machinery for manufacturing segment the economic uncertainty caused by Brexit should not have too much of an impact. The domestic market is reasonably stable and should remain so over the next 12 to 18 months.

Construction-related machinery businesses benefit from continued stable performance of the building industry, with increases in activity in the repair and maintenance markets as consumers refurbish their own property. However, lower business confidence and fewer investments could affect the building industry, while the collapse of the large construction company Carillion earlier this year has already translated into more construction business insolvencies.

UK: Engineering

	2017	2018f	2019f
GDP growth (%)	1.7	1.3	1.4
Sector value added growth (%)	8.2	8.4	0.7

Average sector growth over the past 3 years (%)	-1.7
Average sector growth over the past 5 years (%)	-2.7
Degree of export orientation	medium
Degree of competition	high

Sources: Macrobond, Oxford Economics, Atradius

Many machinery businesses exposed to the oil and gas industry reported losses in 2016 and 2017 and have subsequently restructured or downsized in order to offset falling activity and investment. However, with the recovery of oil prices machinery investment has increased again, albeit slowly, having a positive impact on the supply chain for the time being.

Whether there is a soft or hard Brexit will determine the effect on agriculture and food sectors and ultimately on the agricultural machinery segment (the agricultural sector is currently strongly subsidized by EU-funds).

Ultimately, the profitability of individual machinery businesses depends very much on their engineering expertise, efficient production and access to funding. Furthermore, it is heavily influenced by the activity and health of the end markets they supply, such as retail, food and agriculture, construction, oil and gas exploration and power generation. Overall profit margins have remained fairly stable in H1 of 2018. However, in line with the more sluggish sector growth outlook we expect that profit margins of machinery businesses will decrease over the coming 12 months. That said, while access to funding is certainly key for this capital-intensive sector, obtaining bank loans and tapping into the capital market is currently not an issue for the majority of machinery companies.

British machines sector

Strengths	A lower pound helps machinery exports
	Engineering excellence
Weaknesses	Increased business uncertainty after the Brexit decision
	Skills shortage

Source: Atradius

Payments in the British machinery sector take about 90 days on average. Payment experience has been good over the past two years, and payment delays are not expected to increase sharply in the coming months. However, as UK business insolvencies are forecast to increase 3% in 2019 the machinery sector is expected to follow this trend, with businesses related to oil and gas exploration, construction and agricultural markets mainly exposed.

For the time being, our underwriting stance remains generally open to neutral for the machinery sector. Given the many different players, manufacturing a diverse range of products for a variety of end sectors, our underwriting approach is very much on a case-by case-basis.

We closely monitor the ongoing Brexit negotiation process and the consequences for the British economy, as the machinery sector is heavily reliant on the domestic market. While the true implications of Brexit still remains to be seen, any sharp increase in economic uncertainty, accompanied by deteriorating fixed capital investment and tighter access to funding, would severely affect the industry.

On those segments more affected by Brexit (like agriculture-related machinery) we will seek additional information and discuss with buyers their plans for coping with leaving the European Union in 2019.

Performance forecast along subsectors

Machinery related to manufacturing	Machinery related to construction	Machinery related to oil/gas
		

Source: Atradius

Market performance at a glance

Belgium

- The demand situation for Belgian machines and engineering businesses is generally positive, but still affected by difficulties in some major buyer industries (e.g. construction and transport). While competition is strong, high quality producers usually enjoy a competitive edge. Brexit and looming trade disputes are potential downside risks for export-oriented subsectors.
- In general, the profit margins of Belgian machinery/engineering businesses have remained stable over the past 12 months as companies were able to reduce their cost base. In the coming months margins are expected to remain stable or to deteriorate slightly, depending on the level of activity and the future development of raw material and energy prices. Labour costs continue to weigh on profit margins.
- Gearing continues to be high in the machinery sector due to required investments. Businesses that do not have access to financing cannot perform in a sustainable and innovative way. In general, banks are neutral to moderately restrictive in granting loans.
- On average, payments in the Belgian machinery/engineering sector take around 60 days. Payment experience is average, and the level of protracted payments has been low over the past couple of years. The number of non-payment cases has slightly decreased over the past six months. The number of insolvencies in the industry is at a low to medium level compared to other Belgian sectors, and expected to remain stable in the coming months.
- Our underwriting stance on the sector is generally neutral for machinery businesses related to manufacturing, electronic machinery, and agriculture/food-related segments. However, we are restrictive in underwriting engineering businesses depending on construction, due the subdued performance and rising insolvencies in the Belgian building industry. Non-payment cases remain at an elevated level in the construction-related engineering segment. The energy sector-related machinery segment is currently troubled by a low level of order books. However, the solar, wind, and heating pumps machinery segments are in a positive trend.

Belgium: Engineering

	2017	2018f	2019f
GDP growth (%)	1.7	1.4	1.5
Sector value added growth (%)	1.4	4.9	1.6

Average sector growth over the past 3 years (%)	0.4
Average sector growth over the past 5 years (%)	2.4
Degree of export orientation	high
Degree of competition	high

Sources: Macrobond, Oxford Economics, Atradius

Performance forecast along subsectors

Machinery related to manufacturing	Machinery related to construction	Machinery related to agriculture

Source: Atradius

TABLE OF CONTENS
FULL REPORTS
MARKET PERFORMANCE AT A GLANCE
OVERVIEW CHART
INDUSTRY PERFORMANCE

Denmark

- In 2017 and early 2018 the performance of the export-oriented Danish machines/engineering sector was mixed. Growth was driven by exports of energy optimisation products used in areas such as heating, cooling and water treatment. The same accounts for producers of machines used for automatistion in the manufacturing process. However, there was stagnation in some major segments, negatively affecting profit margins of businesses.
- The wind turbine industry and its subsectors are an important segment of the Danish engineering sector. Globally the long-term growth outlook for wind energy is still positive, but dynamics have changed as sales prices of power generated by wind energy are decreasing. This has put pressure on the profits of turbine manufacturers and their suppliers along the value chain, and further consolidation in the segment seems to be likely. In the coming years rising liquidity issues or even an increasing number of defaults of suppliers are expected.
- Machinery businesses dependent on the offshore oil and gas industry performed rather weakly in 2016 and 2017, as developers have not substantially increased demand. A comprehensive rebound in this segment would require further increase in oil and gas prices.
- Producers of agricultural machines have been affected by lower investments made by the European farming sector, while the dry summer in 2018 is expected to have an additional negative effect on farmers´ financial strength. Despite this, several export-oriented agricultural machinery producers have been successful in diversifying by increasing their share of sales in overseas markets.
- Payments in the Danish machinery sector take 90 days on average and up to 125 days in the wind-turbine segment. Payment experience has been good over the past two years. However, the number of payment delays, defaults and insolvencies is expected to increase in the coming months and in 2019, especially in the wind-turbine and oil- and gas-related segments.
- Insolvencies in the machinery sector mainly affect smaller players who are overly dependent on a few, large customers, coupled with high production costs and and where restrictive access to bank financing has put pressure on liquidity. Therefore, we continue to monitor smaller players more closely. Our underwriting stance on the sector is generally neutral, but more restrictive for businesses in the troubled subsectors.

Denmark: Engineering

	2017	2018f	2019f
GDP growth (%)	2.3	1.6	1.9
Sector value added growth (%)	-5.3	2.7	2.6

Average sector growth over the past 3 years (%)	3.5
Average sector growth over the past 5 years (%)	3.0
Degree of export orientation	high
Degree of competition	high

Sources: Macrobond, Oxford Economics, Atradius

Performance forecast along subsectors

Machinery related to manufacturing	Machinery related to agriculture	Machinery related to oil/gas

Source: Atradius

Germany

- The machines/engineering sector remains one of the main drivers of the German economy, accounting for 3% of GDP. Annual production is forecast to grow about 5% in 2018, according to the German engineering association VDMA.
- German machinery exports increased 4.3% year-on-year in H1 of 2018, with China and the USA being the largest export destinations. Due to its high export ratio of more than 72%, the industry is highly susceptible to certain risks (deterioration of the global economy, rising geopolitical risks, exchange rate volatility and rising protectionism). According to VDMA, increased uncertainty around Brexit and international trade disputes will slow down machinery production growth in 2019, to 2%.
- The industry is characterised by high investment (IT and equipment) and increased labour costs. The equity ratios of machinery businesses are higher than the average of the German industrial sector overall, as necessary investments can often be financed internally (cash flow, shareholder and/or mezzanine loans). Due to this, many machinery businesses are not excessively reliant on bank finance, and bank indebtedness is rather low.
- Margins are relatively high, especially in niche segments. However, margins have come increasingly under pressure in recent years due to rising competition, especially from China.
- Payment duration in the industry is 60 days to 90 days on average. Compared to other German industries, the machinery/engineering sector's payment behaviour and default/insolvency rate is good. The number of non-payment notifications and business failures is expected to remain low in 2018 and 2019.
- Given the general financial strength of Germany's machinery businesses, our underwriting approach remains, by and large, relaxed. However, as in 2017, we remain more cautious with machinery businesses involved in the paper/print subsector, as the shift to digital has resulted in shrinking profit margins, and many companies are still restructuring to adjust their production to customers' needs. Another segment with difficulties is textile machinery, but this subsector represents only a minor share of the German machinery industry.

Germany: Engineering

	2017	2018f	2019f
GDP growth (%)	2.5	1.9	1.7
Sector value added growth (%)	4.6	4.9	3.4

Average sector growth over the past 3 years (%)	1.9
Average sector growth over the past 5 years (%)	1.9
Degree of export orientation	very high
Degree of competition	medium

Sources: Macrobond, Oxford Economics, Atradius

Performance forecast along subsectors

Machinery related to manufacturing	Machinery related to agriculture	Machinery related to construction

Source: Atradius

TABLE OF CONTENS
FULL REPORTS
MARKET PERFORMANCE AT A GLANCE
OVERVIEW CHART
INDUSTRY PERFORMANCE

Singapore

- Growth of Singapore´s machinery and engineering sector is driven by demand for semiconductor and industrial process control equipment as well as refrigeration/cooling systems. Further expansion in 2018 and 2019 will be sustained by robust industrial production growth (8% and 4% respectively). However, business performance and profit margins of machinery traders could be negatively affected by the ongoing trade dispute between China and the US.
- The gearing of machinery businesses is rather low, as most machinery manufacturers in Singapore are parts of global groups, supported by intercompany loans. Banks are not restrictive in lending to the industry.
- Payments in the machinery sector take between 90 days and 100 days on average. Payment experience has been rather good over the past two years, and the insolvency level is low compared to other sectors. No increase in payment delays or insolvencies is expeced in the coming 12 months.
- Our underwriting stance remains generally open to neutral for the industry. We are mainly open for machinery businesses delivering to manufacturing sectors, as this segment benefits from persistent growth in semiconductor and electronic manufacturing activities. The same accounts for food-related machinery, which benefits from persistently growing demand.
- That said, we take a neutral approach to construction-related machinery businesses, as the Singaporean government has taken measures to cool down the property market in order to avoid price hikes. This will slow down growth in the construction sector and demand for related machinery equipment.

Singapore: Engineering

	2017	2018f	2019f
GDP growth (%)	3.6	3.0	2.4
Sector value added growth (%)	7.4	2.5	4.0

Average sector growth over the past 3 years (%)	4.9
Average sector growth over the past 5 years (%)	1.6
Degree of export orientation	average
Degree of competition	average

Sources: Macrobond, Oxford Economics, Atradius

Performance forecast along subsectors

Machinery related to manufacturing	Machinery related to construction	Machinery related to oil/gas

Source: Atradius

Spain

- The Spanish machinery sector has been growing both in turnover and margins over the past five years, and this favorable evolution has significantly contributed to the rebound of the Spanish economy. Machines/engineering is one of Spain´s major export sectors, delivering 70% of its production to markets abroad.
- In the machinery for manufacturing/machine tools segment Spain is the third-largest producer in the EU and the ninth-largest in the world. The main buyer sector is the automotive industry - one of the main sectors of the Spanish economy, with a high volume of investment.
- The EU is by far the main destination for Spanish machinery exports. Quality and price are key in this very competitive market with many active players, both of which are putting pressure on businesses margins. Many Spanish machinery businesses compete in technology segments with lower added value.
- Machinery output is expected to increase 3%-3.5% in 2018 because the flexibility of the production processes facilitates adapting to changing market demands. However, due to its high export ratio the industry is very susceptible to external risks (deterioration in the Eurozone, Brexit impact, oil price volatility, rising protectionism).
- Profit margins are expected to remain stable in the short-term, while access to bank loans is generally open. Payments in the machinery sector take between 60 days and 90 days on average. Payment experience has been rather good over the past two years. No increase in payment delays or insolvencies is expected in the coming 12 months, due to order backlogs and further economic growth in Spain and the EU.
- Our underwriting stance is generally open for the manufacturing-related machinery segment, due to steady revenue growth and a benign outlook. The same accounts for agricultural/food machinery, which benefits from the robust performance of the large Spanish agriculture and food industry.
- Our underwriting stance remains neutral for construction-related machinery. This segment has benefited from construction growth in Spain (construction output increased 3.2% in 2017), but remains susceptible to a potential reversal of the still wobbly recovery of the building industry. We are also more neutral when underwriting businesses dependent on the oil/gas industry, as machinery investments are highly susceptible to commodity price volatility.

Spain: Engineering

	2017	2018f	2019f
GDP growth (%)	3.0	2.7	2.3
Sector value added growth (%)	10.6	5.9	2.9

Average sector growth over the past 3 years (%)	6.7
Average sector growth over the past 5 years (%)	2.6
Degree of export orientation	high
Degree of competition	high

Sources: Macrobond, Oxford Economics, Atradius

Performance forecast along subsectors

Machinery related to manufacturing	Machinery related to construction	Machinery related to agriculture

Source: Atradius

United States

- Revenues of the US engineering industry have rebounded since 2015 after some years of decrease, as greater liquidity in financial markets helped to boost spending on new construction. Businesses' profit margins have increased over the last 12 months, and are expected to remain stable in H2 of 2018 and H1 of 2019. The US machines/engineering sector is forecast to record value added growth of 7.2% in 2018 and 4.5% in 2018.
- Construction-related machinery businesses continue to benefit from elevated US economic growth and the continued robust performance of the domestic construction sector. Quality engineering products will remain in very high demand throughout most industrial segments in 2018 and 2019.
- While the machinery businesses related to the oil/gas or the mining segments had been affected by lower capital spending on purchasing machinery and equipment in 2016 and 2017, higher oil and gas prices have led to a modest rebound in investment since the end of last year.
- In general the dependency on bank financing of this capital-intensive industry is high, and US banks are principally willing to provide loans to the sector. The average payment duration in the US machinery industry is 30 days, however, payment terms can be longer as capital equipment can carry a higher price tag. Payment experience over the last two years has been good, with a rather low number of non-payment cases expected to decrease further in the coming six months.
- Compared to other US industries the number of insolvencies is low in the machinery sector. Business failures have decreased in H1 of 2018 and are expected to level off in the coming 12 months, in line with the overall US business insolvency development.
- Due to the rather moderate credit risk, our underwriting stance for the US machinery sector is generally open. However, some caution is still advised on machinery businesses dependent on the oil/gas and the mining industry, due to the potential impacts of energy price volatility and of the increased importance of environmentally friendly and sustainable energy sources.

USA: Engineering

	2017	2018f	2019f
GDP growth (%)	2.2	2.8	2.2
Sector value added growth (%)	7.2	7.2	4.5

Average sector growth over the past 3 years (%)	2.5
Average sector growth over the past 5 years (%)	-2.1
Degree of export orientation	medium
Degree of competition	high

Sources: Macrobond, Oxford Economics, Atradius

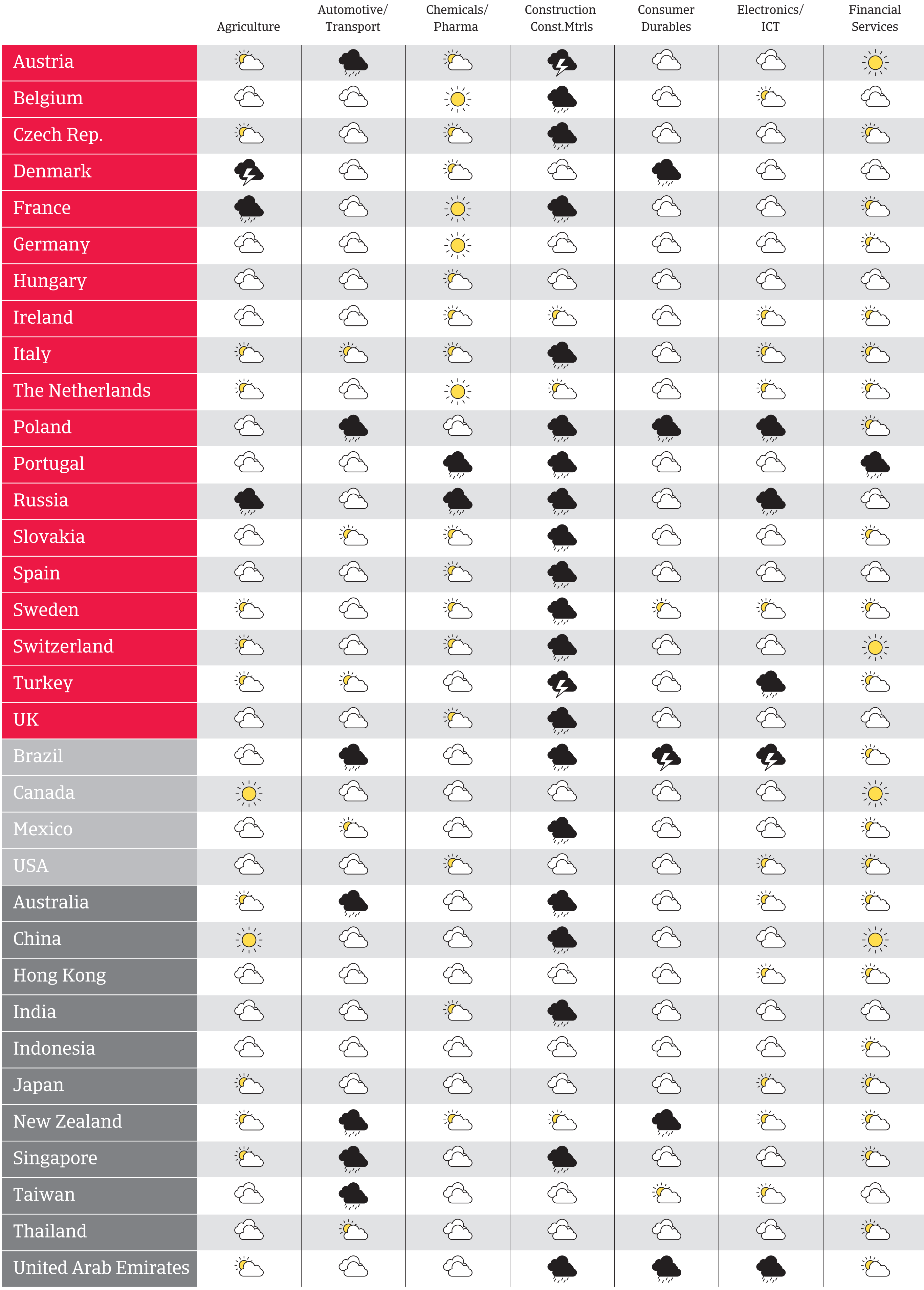
Performance forecast along subsectors

Machinery related to manufacturing	Machinery related to construction	Machinery related to oil/gas
		

Source: Atradius

Industries performance forecast per country

October 2018



Food	Machines/ Engineering	Metals	Paper	Services	Steel	Textiles
Good	Good	Fair	Fair	Good	Poor	Poor
Good	Fair	Fair	Poor	Poor	Good	Poor
Good	Good	Fair	Fair	Fair	Fair	Poor
Good	Fair	Fair	Bleak	Fair	Poor	Poor
Fair	Fair	Fair	Poor	Fair	Fair	Poor
Fair	Good	Fair	Poor	Good	Fair	Poor
Fair	Good	Poor	Fair	Good	Poor	Poor
Good	Fair	Fair	Bleak	Fair	Fair	Poor
Good	Excellent	Fair	Fair	Fair	Fair	Poor
Excellent	Good	Good	Fair	Good	Fair	Fair
Fair	Poor	Fair	Fair	Good	Fair	Fair
Fair	Fair	Poor	Poor	Good	Poor	Poor
Fair	Bleak	Fair	Fair	Poor	Fair	Fair
Good	Good	Fair	Fair	Fair	Fair	Poor
Good	Fair	Fair	Poor	Good	Fair	Poor
Good	Good	Poor	Fair	Fair	Poor	Poor
Good	Good	Fair	Fair	Good	Poor	Fair
Good	Fair	Bleak	Poor	Poor	Fair	Poor
Fair	Fair	Fair	Poor	Fair	Fair	Poor
Good	Poor	Poor	Fair	Fair	Poor	Poor
Good	Fair	Bleak	Poor	Good	Bleak	Bleak
Good	Fair	Poor	Good	Good	Poor	Poor
Good	Fair	Fair	Poor	Good	Fair	Fair
Good	Fair	Poor	Poor	Fair	Poor	Poor
Good	Fair	Bleak	Poor	Good	Bleak	Poor
Excellent	Fair	Poor	Fair	Good	Poor	Fair
Good	Fair	Poor	Good	Good	Poor	Fair
Good	Fair	Poor	Fair	Fair	Poor	Fair
Good	Fair	Fair	Fair	Good	Fair	Poor
Fair	Fair	Fair	Poor	Poor	Poor	Poor
Good	Fair	Fair	Fair	Good	Poor	Fair
Excellent	Fair	Poor	Fair	Good	Poor	Fair
Good	Fair	Fair	Fair	Fair	Poor	Bleak
Poor	Fair	Poor	Fair	Good	Poor	Poor

Excellent

Good

Fair

Poor

Bleak

Industry performance

Changes since September 2018

Europe

Belgium

Automotive/Transport

Down from Good to Fair

In the transport subsector, insolvencies have increased in the garage and the road transport segments.

Construction/Construction Materials

Down from Fair to Poor

Both business insolvency and the number of credit insurance claims have increased.

Czech Republic

Machines/Engineering

Up from Fair to Good

The machines/engineering industry increasingly benefits from rising revenues and a solid order situation.

France

Construction/Construction materials

Down from Fair to Poor

Cash difficulties in the sector are rising as businesses find it difficult to fund their increasing working capital requirements in the recovery that has followed several difficult years. Operating margins remain tight, while a significant amount of cash is required to fund increasing order books. Additionally there are indications that the rebound in construction activity has already reached its peak, with the first signs of slackening on the horizon.

Ireland

Construction

Up from Fair to Good

The industry has seen consistent growth for some time, and there is real demand to increase house building over the next 2-3 years.

Electronics/ICT

Up from Fair to Good

The sector´s growth performance is strong, and it benefits from a continuing inflow of foreign direct investment (FDI) from US multinationals..

Portugal

Paper

Down from Fair to Poor

The industry has been severely hit by a persistent price increase for pulp in international markets, coupled with a very competitive market environment. This has led to a deterioration of business margins while even some of the sector’s leading companies suffered substantial losses.

The Americas

United States

Automotive

Down from Good to Fair

Sales of new cars have been rather subdued in 2018 while uncertainty over the potential imposition of import tariffs for cars and car parts persists.

Metals

Up from Poor to Fair

Steel

Up from Poor to Fair

Adjusted pricing in the US market following the implementation of tariffs has led to increasing revenues and improved profitability for domestic steel and metals producers. However, depending on the level of international sourcing, smaller steel and metals service centres are being affected by cash flow pressure related to the working capital lag associated with higher raw materials pricing.

Textiles

Up from Poor to Fair

In line with the robust performance of the US economy, textiles/clothing sales have increased.

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