CBI
Ministry of Foreign Affairs

CBI Product Factsheet: Agricultural Axles and Axle Parts in EU5

'Practical market insights for your product'

Agricultural axles are and will likely continue to be a growing market in the EU5. Germany, France and the UK are the biggest import markets with a relatively low share of imports from the DCs, creating an opportunity for the export of good quality and competitively priced products. There are opportunities both in the OEM market due to these countries' product output, and in the aftermarket, where parts such as brake drums, suspension parts, drive shafts, yokes and axle rims are in demand. The best way of accessing the market for developing country producers would be through OEM/OES subcontracting or selling through pan-European or national wholesaler networks.

Product definition

Axles and their parts are grouped under "Drive Axles with Differential" (HS codes 87085010, 87085020, 87085035, 87085055, 87085090, 87085091 and 87085099). This Product Factsheet analyses the role of axles and their parts as used in the agricultural machinery for EU5 countries (Germany, France, the UK, Italy and Spain), i.e. the biggest Western European economies.

Product specifications

Quality: Compliance with international standards and the European standards on safety is required, as well as conformity to existing EU and national legislation and practices. The ISO/TS 16949 standard is considered to be the highest level of quality. This standard is important for the European automotive industry as it outlines the best practices when designing, developing, manufacturing, installing or servicing automotive products.

The quality, reliability and durability of axles used in agricultural machinery in Europe is very high because the machines are used for extended periods of time daily and do not always have extensive maintenance schedules. This means that the parts supplied to the market have to be carefully manufactured and inspected as defective parts may be returned.

Materials: Traditional agricultural axles are made of forged steel or for extremely heavy applications of tempered seamless steel or modular cast iron. Axles are typically comprised of the following parts and component materials:

- Nuts, washers and lockwashers, bearing cups, cones and rollers, oil seals and slingers, spindles, filler plugs, knuckles and arms, shims and shim packs, pivot pins, capscrews, joint yokes, axle shafts and shaft guides, axle housing and housing cover, ring gears and pinions, differential gears, bolts, lock straps, steering tie rods, gaskets.

Considerations for action

- For more information on requirements for exporting casting and forgings to the EU, please refer to the CBI Buyer Requirements database for more information on Labels and Standards: Sustainability in Casting and Forging

Packaging & Labelling*:* Axles are typically packaged in cardboard and/or wooden boxes to protect them from being damaged. They are labelled with a description of the technical parameters, such as model type, basic load capacity (in kilograms or pounds), gearing size or series, manufacturing location, housing wall and brake type.

In general, packaging is dependent on the buyer, either OEM or end-user consumer (aftermarket). For aftermarket applications, the packaging is typically one-way packaging, in which the packaging is discarded after a single use. Returnable packaging is the most often used by OEM suppliers, in order to reduce cost and improve efficiency of the packaging operations. Returnable packaging is not thrown away after use. The empty packaging is circulated by the OEM or a designated packaging operator. If you want to export to the EU, you must ensure that the packaging you use for your products meets all EU requirements. To reduce the harmful impact of packaging on the environment, the EU has specified legislation concerning the management of packaging and packaging waste.

Considerations for action

- For more information on requirements for packaging and packaging waste, please refer to the European Commission

Design*:* The design of axles depends on the make and the model of the machine they need to fit and will also depend on their expected load rating and necessary dimensions. The manufacturers should anticipate that there is an increasing trend towards greater speed capability in agricultural machinery (up to 65 km/hour), which may affect the axle construction. In Europe, most tractors and other relevant agricultural machinery have a front and a rear axle, although there are also single and multiple-axle tractors/trailers. The most typical axle configurations include 4x4, 4x2, 6x4 and 6x6 (the first number indicating the quantity of axle ends and the second indicating how many of them are driven by the engine). Axles are rated according to the weight they can carry; front axles will typically range from 4.5 to 10.5 tonnes while rear axles may range from 9.5 to 21 tonnes and can be differentiated by the engine power (HP/torque) usage: light class – 20-75 kW, middle class 75-150 kW, and heavy class >150 kW.

Figure 1: Agricultural axles and axle parts

Source: Fotolia/Internet

Buyer Requirements

Legislative Requirements: The most important requirement for automotive components is that they comply with the technical standards set by EU legislation in order to guarantee vehicle and environmental safety.

Type-approval is a certification for various types of motor vehicles and their components which includes agricultural and forestry tractors. The type approval or certification is valid in all EU Member States and is required when selling any products in the EU. Many automotive components are not approved until the final assembly, in which case certification of individual components is not necessary, although these components will still have to comply with type-approval requirements.

The End of Life Vehicles (ELV) Directive aims to avoid environmental pollution during the scrapping process through reducing the hazardous materials used in vehicle production. Vehicles must be designed to facilitate proper dismantling and recycling (by coding the components), and the use of heavy metals such as lead, mercury, cadmium and hexavalent chromium is prohibited (with the exception of a few applications).

Considerations for action

- Check with your buyer, or with the approval authority of the country you want to export to, what the specific standards are for the parts you are manufacturing.
- Read more about type approval at the EU Export Helpdesk.

- Check if your buyer uses the International Material Data System (IMDS). This is a collective, computer-based data system developed by automotive OEMs to manage environmentally relevant aspects of the different parts used in vehicles. It has been adopted as the global standard for reporting on material content in the automotive industry.

Common buyer requirements: In addition to legislative approval, there are other common buyer requirements. While these are not obligatory in the legal sense, they are implemented by various competitors in the market and are thus necessary in order to compete effectively.

Quality Management: In order to apply for type-approval, production processes need to meet quality management criteria. ISO TS/16949 and ISO 9001 are accepted as standard requirements and EU buyers and manufacturers often insist on them.

Corporate social responsibility (CSR) and the extent to which buyers expect a certain level of social and environmental performance is becoming increasingly important. Bigger EU companies have developed their own CSR policies and require their suppliers (and their sub-suppliers) to conform to these. Signing a supplier code of conduct is often a prerequisite. These codes of conduct generally cover compliance with local laws, protection regarding workers' health and safety, respecting basic labour rights and also business ethics. The implementation of an environmental management system is often a requirement for core suppliers.

Considerations for action

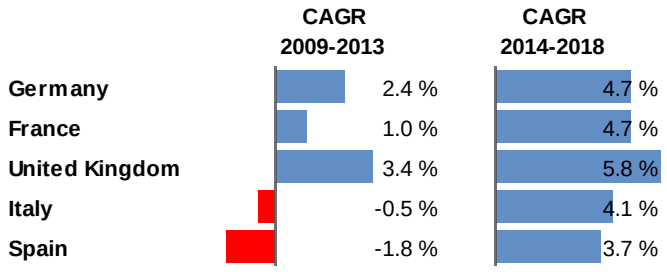
- Implement ISO 9001 and ISO TS/16949 as it is a standard requirement of EU buyers. Click here for more information on ISO TS/16949 at the ISO website

- Most big car brands publish their CSR policies and supplier code of conduct on their websites. An internet search for these may give valuable insight into assessing your company's performance by comparison.
- Implement an environmental management system, such as ISO 14001, as it is a common requirement.

Macroeconomic statistics

The GDPs of the EU5 countries have on average grown by only 1.3% between 2009 and 2013. However, the IMF predicts considerable GDP growth in all of the EU5 countries between 2014 and 2018. The estimated UK GDP CAGR for 2014-2018 is an impressive 5.8%, followed by solid increases in all other EU5 countries. Italy and Spain, in particular, have gone from negative growth during 2009-2013 to close to 4% estimated growth for 2014-2018.

Figure 2: GDP Compound (current prices) Annual Growth Rate (CAGR) for 2009-2013 and 2014-2018 in EU5



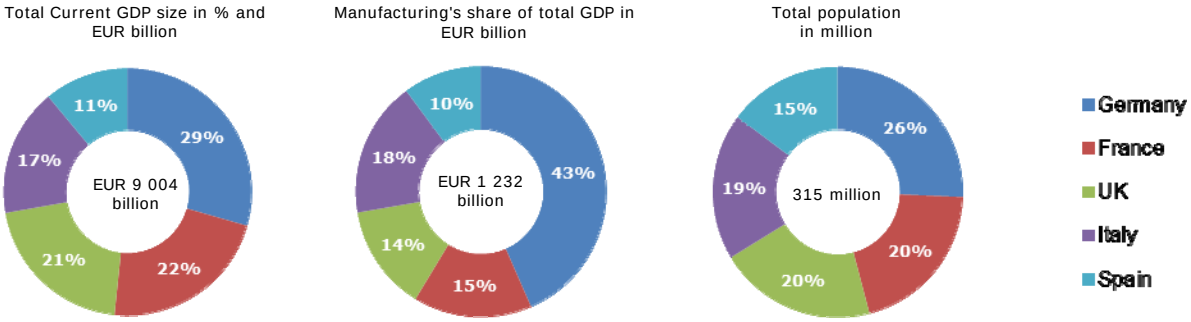
Data source: IMF 2014, World Economic Outlook Database

The total GDP value for the EU5 countries was estimated at more than €9 trillion in 2013. Germany is the largest market in the EU5 with a GDP of €2.65 trillion accounting for almost one third of the total GDP and with by far the strongest manufacturing base of all EU5 countries (€535 billion in 2013). Germany is followed by France and the UK, each of which represent roughly one fifth of the GDP value and 15% of the total manufacturing value for the five countries. With the 2013 GDP close to €1 trillion and the manufacturing value of €125 billion, Spain is the smallest of the five economies.

In 2013, the EU agricultural machinery market was estimated to be worth €24.8 billion – equivalent to 30% of the global sales. The EU is also the biggest

manufacturer of agricultural machinery, withsales of more than €26 billion in 2011. Although the European agricultural machinery industry is in a solid economic position with many markets in high demand, over the short/medium term it is expected to stagnate.

Figure 3: Key 2013 macroeconomic indicators for EU5, in € billions (population in millions)



Data source: IMF and OECD 2014

Trade Statistics

Imports and exports

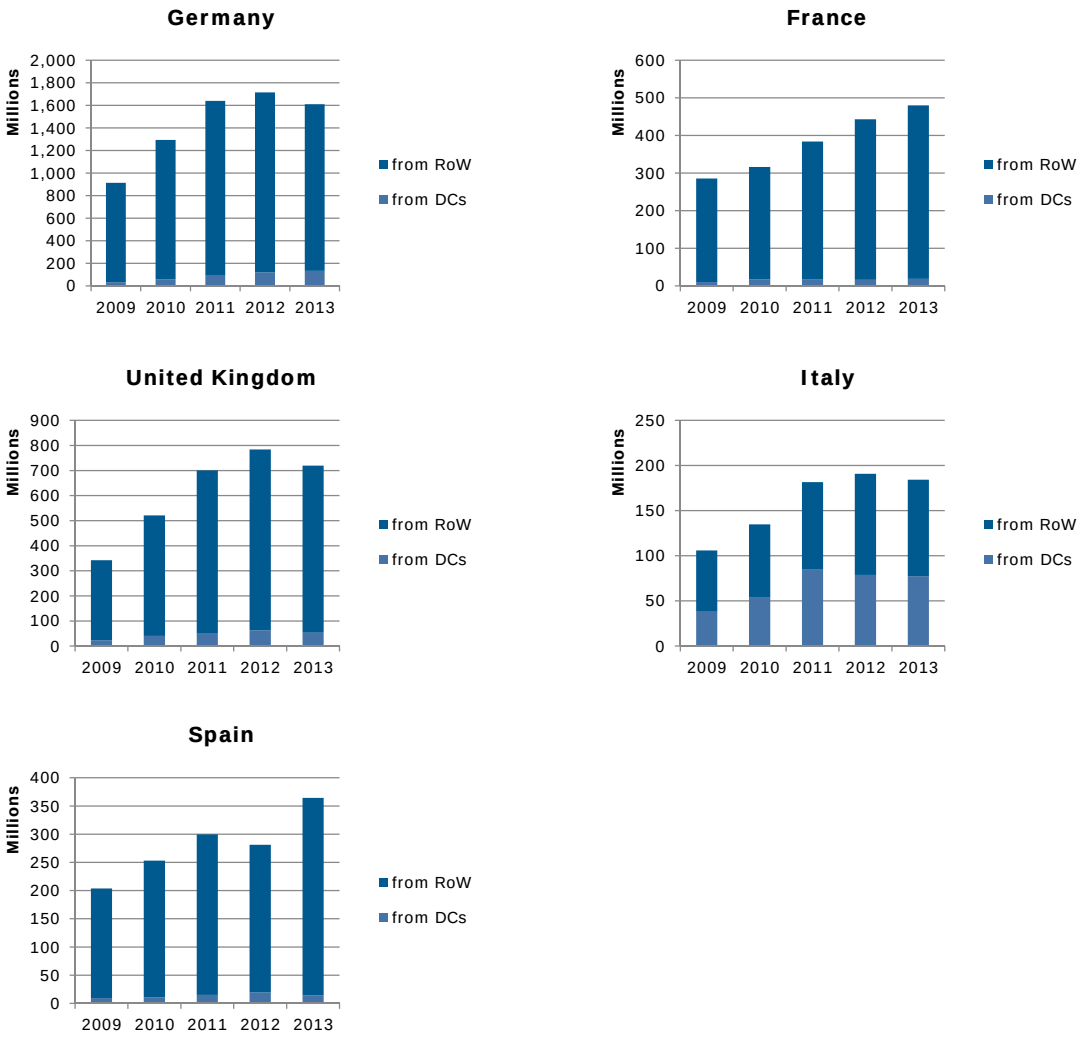
EU5 imports roughly €3.4 billion worth of axles and axle parts each year. Germany alone represents close to 50% of the imports with an import value of €1.6 billion in 2013. It is followed by the UK with €720 million and France with €480 million. The imported axles and axle parts are mainly shipped from Western and Eastern Europe as well as from other developed countries such as Japan, the United States and Korea.

Imports of axles and their parts from the Developing Countries (DCs) to EU5 represented almost €300 million (8.8% of total) in 2013 and grew at a CAGR of 27% between 2009 and 2013. Germany and Italy combined represent over 70% of DC axle imports to the EU5 with €134 and €77 million, respectively. Italy, in particular, imports over 40% of its axles from the developing countries.

The biggest DC exporters of axles and axle parts to EU5 are Turkey (€99 million), India (€59 million) and China (€56 million), together accounting for over 70% of axle imports from DCs to EU5. The axle imports from India and China have more than tripled in the last five years, while the imports from Turkey have more than doubled.

Since the EU5 nations are important consumers and manufacturers of axles, it is expected that their axle imports will grow over the next few years. The share of axle imports from the DCs has been on the increase since 2009 and is expected to grow further, thanks to their competitive pricing.

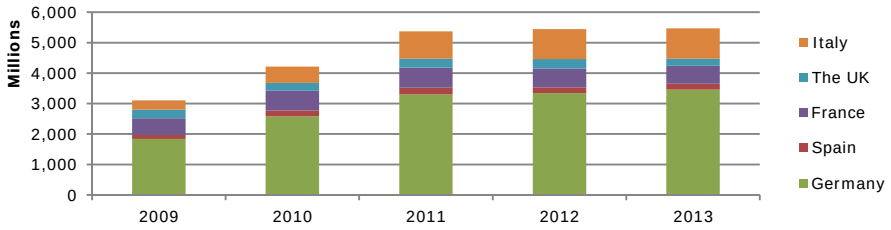
Figure 5: Imports of axles and axle parts in the EU5, € million (the range of the y-axes varies by country due to different import levels)



RoW: Rest of the world
Data source: Eurostat 2014

EU5 is a net exporter of automotive axles and axle parts. In 2013, it exported close to €5.5 billion worth of these. Germany is by far the largest exporter of axles and axle parts among the EU5 countries, with close to €3.5 billion in exports (comprising a 63% share of all EU5 axle exports). It is followed by Italy with €1 billion (18% share of the total). EU5 axle exports have been quite resistant against economic disruptions. The export market is subject to European demand, as nearly 65% of the exports end up sold in Western and Eastern Europe. However, it must be noted that the exports to DCs have more than doubled, growing from €473 million to €1.04 billion between 2009 and 2013.

Figure 6: Exports of axles and axle parts, in € million

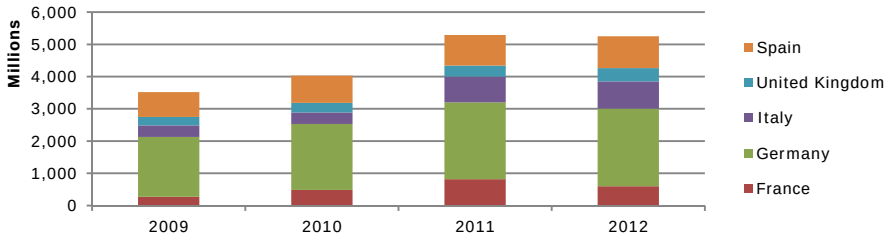


Data source: Eurostat 2014

Production and consumption

Total axles and axle parts production in EU5 was estimated at €5.25 billion in 2012. Germany is the biggest producer with a 2012 production value of €2.4 billion, representing close to 46% of the total EU5 axles and axle parts production. It is followed by Spain with €987 million and Italy with €844 million. These three countries represent over 80% of the total axle production in the region. The production has shown a strong 14% CAGR between 2009 and 2011, before levelling off in 2012.

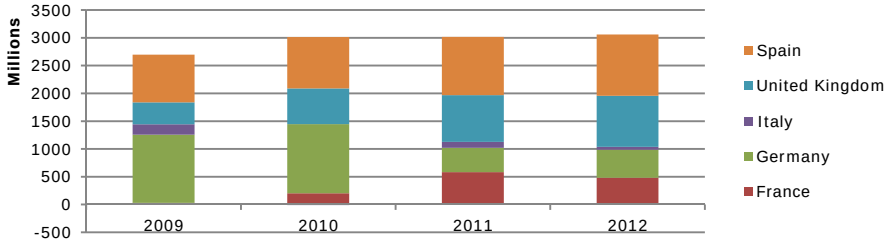
Figure 7: Apparent production of axles and axle parts in the EU5, in € million



Data source: Eurostat (Prodcom) 2014

France and the United Kingdom represent the biggest growth in axle consumption in the past four years. This coincides with their increasing import of axles, which includes the imports from DCs. This means that these markets are increasingly open to sourcing parts from developing countries, creating an opportune trend for DC manufacturers. The apparent level of consumption of axles and their parts in the EU5 has grown sharply from €2.7 billion to €3 billion (up 11.4%) between 2009 and 2010, but has remained very stable thereafter growing only 1% per year through 2012. The United Kingdom and Spain represent roughly 66% of the total EU5 consumption.

Figure 8: Apparent consumption* of axles and their parts in the EU5, in € million



*Apparent Consumption = Production + Imports – Exports
Data source: Eurostat (Prodcom) 2014

For more information on automotive trade statistics, please refer to CBI Market Trade Statistics

Market trends and opportunities

There are major opportunities to be explored in all the EU5 nations in the OEM market as well as in the aftermarket sector (including new spare parts and remanufactured components).

Although the OEM market is experiencing a slowdown in the EU5 nations, with new orders stagnating or declining, there are still opportunities for axles and axle parts manufacturers. Despite the recent decline, EU5 economies remain very sizable markets and the slowdown in demand means that they will need cheaper production alternatives. The easiest way to market these alternatives would be to arrange meetings with local agricultural parts wholesalers or the OEMs and/or component/systems suppliers and approach them with a subcontracting offer. When dealing with larger OEMs, certain criteria for manufacturing specifics will need to be in line with each individual OEM's requirements.

In respect of the aftermarket sector, the greatest opportunities lie in subcontracting the production of axle parts such as brake drums, suspension parts, drive shafts, yokes for drive shafts and rims for axles. Exporters targeting the aftermarket sector may find it advantageous to enter the sector through the independent distributor channel, as distributors tend to carry a larger variety of parts in their inventory rather than focusing on a few selected suppliers.

The German market offers the best opportunities for axles and axle parts due to its overall size, its share of imports from the DCs, the growth of the agricultural machinery market, investments in local manufacturing and its stable business environment. The country imports €1.6 billion worth of axles and axle parts and in monetary terms imports the greatest amount of parts from the DCs -. €134 million in 2013. It is the only nation in the EU5 where domestic production capacity is actually increasing, making it the best target for imports.

The UK and France are equally promising markets for DC exporters due to the fact that they are the second and third biggest axle and axle parts importers in Europe, importing €719 million and €480 million worth of these products respectively. Additionally, France is the second largest agricultural machinery market in Europe and is currently the only nation in the EU5 agricultural machinery orders are on the rise. The UKmore than doubled their axle and axle parts imports between 2009 and 2013 and it is expected that axle imports for these two countries will continue to grow in the years to come. At present, both of these countries have a relatively low share of axle imports from the DCs (7% and 4% for the UK and France respectively) creating an opportunity for DC exporters to make headway in these markets.

Spain is the fourth largest axle and axle parts importer within the EU5, with imports valued at €364 million in 2013. Some 5% of the imports come from the DCs, creating an opportunity for DC exporters to gain ground in this country by providing good quality parts at a more competitive price. Axle and axle parts imports have grown by a factor of 1.8 between 2009 and 2013 and this growth is expected to continue.

Italy is the smallest market for axles and axle parts imports, with 2013 imports estimated at €184 million. It must be noted, however, that 42% of these imports currently come from developing countries, which demonstrates that the Italian industry is extremely open to cooperation with DC producers. The value of Italian imports has grown at a strong compounded rate of 15% annually between 2009 and 2013, despite the fact that the internal agricultural machinery market has experienced a slowdown. The fact that this growth in imports has been experienced during a stagnant period indicates that, as the market has bottomed out, that growth could accelerate and thus present further opportunities for DC producers.

For more information on automotive market trends, please refer to CBI Market Trends

Price

Apart from the distribution of new parts, the aftermarket for agricultural parts also encompasses a lively distribution of used or overhauled parts and components. Pricing depends on the supply chain positioning. The aftermarket, in particular, is very discount-driven and has varied mark-ups at each distribution step, and for different parts and components. Due to large variation in types and models of parts, it is difficult to provide a general overview of agricultural axle prices, but it is possible to provide some insight into margins imposed by different players in the supply chain. Based on the margin ranges, DC suppliers selling to the tier 3 supplier in the OEM supply chain could price their products at between 64% and 81% of the OEM delivery price. In order to better ascertain prices of specific products and models, you can search the internet to determine the appropriate range, or talk directly to wholesalers and/or retailers. The differences in price of branded spare parts will not be great among the various countries. Those players who are present in several European countries have largely harmonised their prices; any differences in pricing may occur because of different logistics and local costs.

OEM supply chain	Margin
Tier 1 supplier delivering to OEM	6-8%
Tier 2 supplier delivering to tier 1	6-15%
Tier 3 supplier delivering to tier 2	10-25%
Aftermarket OES supply chain	**Margin**
Tier 1 delivering to OEM for OES sales through approved service chain	10-30%
Tier 1 delivering to OEM for OES sales through independent outlets	10-25%
OEM delivering OES parts through its approved service chain	25-65%
OEM delivering OES parts through independent outlets	30-40%

Main sources

- European Commission's macroeconomic publications
- IMF – good source for macroeconomic information
- OECD – good source for macroeconomic and industry-specific information
- European Commission's Directives and Regulations pertaining to wheeled agricultural or forestry tractors
- CEMA – Agricultural Machinery in Europe
- Trade fairs are a good place to network, to meet buyers and to promote your company. The most prominent agricultural machinery trade fairs in EU5 are: Paris International Agri Business Show: SIMA-SIMAGEMA, German Agricultural Machinery and Equipment Fair: Agritechnica Hannover, Italian Agricultural Machinery Fair: EIMA

This survey was compiled for CBI by Global Intelligence Alliance