

An overview of the world rolling stock industry

The global rolling stock industry holds some secrets even from professionals in the field. Prisoners of “here and now” developments in the field, some miss the global trends, the developments of this industry. What are the dependencies of this industry on the other branches of the world economies? How heterogeneous is the industry? Where is the production of rolling stock located and what are the factors that influence it? Where is the demand for rolling stock located, what are the business models in the field? All these are questions to which a recent OECD study gives answers.

by Doru Cireasa

Since the proclamation of free trade as the source of global well-being, humanity is evolving towards a protectionism from which even the powerful Western economies do not escape. Humanity is in a period dominated by low customs tariffs which would encourage global trade in components of the rolling stock industry. However, this is not happening, because instead, the governments of the world, regulatory entities have put up barriers that are not so much commercial as they are technical in nature.

Trade tariffs applied to rolling stock and signalling equipment are generally low and therefore do not appear to be a major trade barrier. However, their absence is “made up for” by other requirements, originating from the complexity of the field or, perhaps, from the desire of developing countries to force technological transfer in the rolling stock industry. Public policies such as the imposition of joint ventures, prior licensing, requirements for standardisation or adaptation to local rules have become non-transparent and may have the effect of a preference for domestic companies or traditional operators in public procurement contracts and, thus, make up significant barriers to market access.

Often the explanation for this protectionism lies in the desire of less developed countries to protect and encourage their local industries. Rolling stock manufacturers were sometimes required to transfer their technology to local companies that were frequently state-owned, in order to enter foreign markets.



Rolling stock, one third of the railway industry

But what percentage of the railway industry, which also includes track works, signalling, automation, electrification, is represented by the production of rolling stock?

The European Rail Industry Association (UNIFE) estimated the global rail supply market at more than EUR 170 billion annually over the period between 2017 and 2019. The figures come from a study conducted by the Roland Berger GmbH consultancy company. Of this amount, rolling stock accounted for approximately one third, and rail services for another third. Infrastructure and rail traffic control had shares of 18% and 9% respectively. The rest of the market (a smaller segment) concerned the consultancy and works management companies.

Separating and delimiting business is often not an easy task. The same companies are often involved at different stages of a railway project or provide bundled offers of railway equipment and services. In its 2020 annual report, the Spanish company CAF noted that the supply of trains represented 44% of its total sales, while services (e.g. leasing and maintenance) represented 19%. Civil construction, signalling and engineering yielded the Spanish company another 11%. For the French company Alstom, rolling stock accounted for just over half of its total revenue three years ago. In terms of revenue generation, this was followed by the services provided (20%), railway signalling (18%) and turnkey offers, with a weight of 10%.

Specifics of the railway industry. Long useful life of the rolling stock

In addition to the complementarity of various segments of the railway industry, it also has other specifics. Rail transport hinges on large investments in long-lived infrastructure and equipment, which make its deployment slow and complex. Siting decisions can cause controversy between landowners and residents, and the laying of railway tracks cannot be achieved without extensive, complex engineering works such as the construction of

bridges or tunnels.

There are also issues that may seem contradictory at first glance. Companies typically use rolling stock for decades (for example, the average for French railways is 40 years) while technical specifications and standards for various components, signalling technologies and electrification and safety systems evolve rapidly. These latter elements prevent the extension of the useful life of railway equipment and impose constraints on future purchases of equipment that need to be compatible with the older, pre-existing infrastructure.

Industry location. The three basic regions

The study also provides information on the location of the railway and rolling stock industry in the world. These industries are concentrated in the Asia-Pacific region, North America and Western Europe. Of a length of 1.7 million km of railway track installed worldwide, almost three quarters are found in those three regions. The study by the German consultancy company Roland Berger showed that Asia-Pacific and North America each own a quarter of the world's network, but less than half of their network is electrified. These lines are mostly used for freight transport.

But when it comes to high-speed and very high-speed lines, the balance of the three regions shifts. China holds almost seven out of ten kilometres of high and very high-speed rail, while the total length of rail worldwide is about 56 thousand km. The explanation lies in the high level of investments made in the field by the Chinese government.

But if we look at the length of the high-speed networks relative to the land size, more precisely, if we talk about the density of the lines, the ranking changes, with China being outranked by Spain, South Korea and Japan. The data, valid for 2020, places China in eighth position after the mentioned countries, but also after other European countries, such as Belgium, France, Germany and Switzerland.

Geography of railway developments

The study also shows the importance of the geographical features of a territory or country in the development of rail transport networks. Mountain ranges and rivers can pose significant obstacles to the expansion of networks, forcing the choice of expensive technological solutions. An alternative in such cases is the creation of bypass routes that lead to an increase in transport prices. As for the rolling stock industry, its development depends on the type of railway transport. Thus, high-speed rolling stock is less produced in North America and more in Asia Pacific or Europe because ultra-fast rail transport is not an important part of the landscape in the former region. Recent projects carried out in the Arab world (Saudi Arabia, Morocco) will make it surpass North America, from this point of view, according to a study by the consultancy company Roland Berger. From the point of view of train composition solutions, Multiple Units (MU) are mainly found also in Europe and the Asia-Pacific area. According to figures in some studies, over 60% of all MUs are in operation in France, Germany, Italy and the United

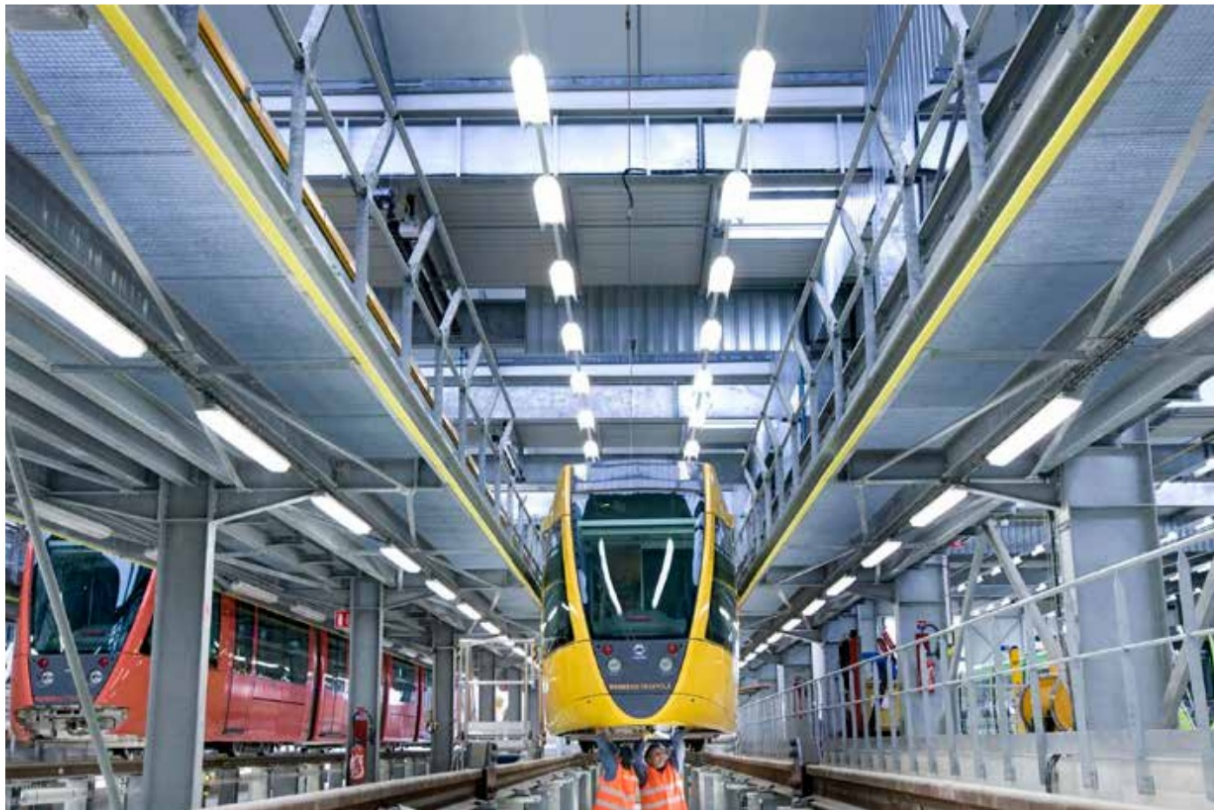


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Kingdom. But when it comes to rail freight, it seems more established in North America, Eastern Europe and Central Asia, along with the Asia-Pacific area. This component of rail transport is very important because the rolling stock used by it accounts for as much as 90% of the global installed base of all rolling stock. Long supply chains, such as mining and processing facilities for products such as iron ore, bauxite, coal, fertilisers, chemicals and even crude oil can only be properly operated by rail in regions in Canada, Australia, Brazil, Russia or the States United. Likewise, grain is best transported by rail, as are mining products. More than 80% of the difference between the European Union and the United States in the share of freight carried by railways could be ascribed to natural geographical differences such as obstacles to cross, shipment distances and commodity mix.

The rest up to 100% of the difference is explained by the economic policy and regulatory factors, such as the lack of cross-border interoperability across parts of Europe and the priority given to passenger service. The absence of access to sea transport routes combined with long transport distances in areas with low population density have led to the development of large fleets of usually diesel locomotives as the electrification of these regions requires significant funding. Asia-Pacific, North America, Russia and Central Asia have the largest installed base of locomotives worldwide, according to UNIFE and Roland Berger GmbH data of 2020.

From the point of view of the spread of rolling stock for urban transport, Europe and China shared the main segments of rolling stock dedicated to this transport, namely, metros, trams and monorail systems.

China has the largest installed base of metro vehicles, while Europe leads in light rail systems such as trams.

Demand for rolling stock

The global rolling stock market in 2020 is estimated at around USD 70-75 billion, dominated largely by the Asia-Pacific, Europe, and North America. The demand is again influenced by the specifics of this industry in the sense that the long useful life of railway vehicles forces the rolling stock manufacturers to present their offer to international markets, thus making the rolling stock market eminently



international. Companies end up competing globally to win large contracts. Therefore, market access is crucial and the demand for rolling stock is directly dependent on the demand for rail transport.

The latter, in turn, depends on a complex set of interrelated factors, including intermodal competition in the broader transport market. Competition from other modes of transport is a major factor affecting the demand for rail transport, but there are limits to the possibility of substituting one type of transport for another. The OECD's International Transport Forum (ITF) states: "mode shift is difficult to achieve at scale because rail services can only replace air travel on high demand routes and over a limited distance". In the freight market segment, "a significant share of road freight trips simply cannot shift to rail, not to mention intercontinental trade, which relies on sea transport and to a lesser degree on airfreight." Other drivers impacting the demand for railway vehicles are urbanisation, environmental considerations such as air pollution and climate change, and public and private investment in transport infrastructure.

Given that many railway companies remain in the hands of governments, a large part of the passenger rolling stock market involves bidding for public contracts issued by public entities. In certain cases, state-owned railway companies have a complete domestic monopoly; this is the case, for example, of China Railway, which accounts for virtually all purchases of passenger rolling stock in mainland China, except for urban transit.

COVID pandemic

Global developments have been heavily influenced by the COVID 19 pandemic of the past years. It has disproportionately affected rail passenger transport, and the packages of measures adopted by states to support the recovery have also included financial aid for the rail sector. In North America, the US Federal Government has made more than USD 1.69 billion available to Amtrak to provide relief from the impacts of the coronavirus epidemic.

Another, much more significant, funding, of USD 66 billion was made available under a package of legislative measures on infrastructure investment and jobs that became law at the end of 2021. In Europe, the European Commission approved in the summer 2021, EUR 550 million in state aid to compensate Deutsche Bahn. Its subsidiary DB Fernverkehr AG received the money as compensation for the decline in revenue caused by the pandemic. The national plans submitted by EU Member States under the EU's Recovery and Resilience Facility are expected to include some support for the rail sector.

Freight transport offers a different picture, with the segment having, on the whole, withstood the pandemic better due to higher demand for key goods and commodities. A particular evolution was the one in the United States where, despite the consistent demand for freight transport, the number of rail freight carloads decreased after 2007, the explanation being the replacement of coal with gas in the energy mix of the country.

An industry of mergers and acquisitions

Perhaps more than many other industries, the rolling stock is one of acquisitions and mergers. The desire for technological transfer, the reduction of costs by producing equipment where it is required, the internationalisation of the businesses we talked about above and the increase in competitiveness are possible explanations for the high number of mergers and acquisitions.

Recent years have witnessed considerable consolidation and reorganisation through mergers and acquisitions in the rolling stock industry. The most recent move in the market is the acquisition of Bombardier Transportation - the rail activities of Canadian group Bombardier - by France's Alstom in January 2021. This follows French manufacturer Alstom's failed attempt to merge with Siemens Mobility. The operation was blocked by the European Commission on the grounds that the merger would have "harmed competition in markets for railway signalling systems and very high-speed trains."

Also of significance in recent years has been the sale by General Electric (GE) of its locomotive business to Wabtec (United States) in 2019 and its signalling business to Alstom earlier in 2015. Hitachi Japan has entered the European market through the acquisition in 2015 of two Italian companies, namely AnsaldoBreda, a rolling stock manufacturer, and Ansaldo STS, a signalling company.

Also in Asia we have the merger (2015) of the two Chinese rolling stock manufacturers CNR and CSR, resulting in the formation of the state giant CRRC. This can be considered the largest consolidation that has taken place in the rolling stock industry in the recent past. With consolidated revenues of USD 36 billion, CRRC became the world's largest manufacturer of rolling stock in 2020. The figures show that the Chinese company has 25% of the global market. China Railway Rolling Stock Corporation (CRRC) is a central state-owned company under the direct supervision of the State-owned Assets Supervision and Administration Commission (SASAC).

Manufacturer of the widest range of railway equipment, namely MUs, urban transit, light rail, high speed and very high speed, locomotives, coaches, signalling and control equipment, services, turnkey management and infrastructure, CRRC is living proof of the Chinese strategy, otherwise criticised by the West, of consolidating market actors with public aid. Moreover, CRRC itself has since engaged in further acquisitions, including the diesel locomotive manufacturing business of the German company Vossloh in 2020. The deal left the German company to focus its remaining activities on the provision of rail infrastructure and signalling activities in the area.

Large manufacturers tend to come from regions of the world that possess a relatively large installed base of train tracks and rolling stock. Spain, which has the densest HS network in Europe, has, for example, two major rolling stock manufacturers, namely CAF and Talgo. Both companies are mostly focused on passenger transport. Several manufacturers are based in Japan (e.g. Hitachi and Nippon Sharyo), home to the world's first HS line, while

others operate from France, Germany and South Korea.

Rolling stock manufacturers tend to be based in jurisdictions with a large domestic market, but most companies have a global scope and typically bid for contracts around the world. Their manufacturing operations are often globalised as well, with the view to serving distant markets from closer locations. Policies certainly play a role in driving location decisions, but transport costs are also an important factor. Similar to many industrial sectors, rolling stock manufacturing appears to be concentrated, with 20 companies accounting for nearly 80% of global annual sales. Industrial strategies are different and there is considerable heterogeneity in both size and degree of vertical and horizontal integration. Some are large industrial conglomerates for which rolling stock is a business sub-segment (e.g. Hitachi and Siemens), and others are large rail supply companies covering the whole spectrum of railway signalling and control, rolling stock manufacturing, services and turnkey management (e.g. Alstom and CRRC). In addition to rolling stock manufacturers, there are other major rail supply companies that specialise in the provision of train signalling and control. Here the main players in the market are China Railway Signal & Communication Co., Ltd. (CRSC), a central state-owned enterprise, and Thales, the French aerospace and defence conglomerate. It is 26% owned by Bpifrance (France's public investment bank) and generates one euro in ten from the rail industry. Other key players in the rail control market include large telecommunication network groups, such as Nokia and Huawei.



Photo: astratranscarpatic.ro

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