

The modal share of rail in inland transport and infrastructure investment

Abstract:

Using OECD rail and road transport data from the 2007 to 2021 period, it is evident that despite a general growth in the global rail market, its modal share in both freight and passenger transport, as well as infrastructure investment, has tended to steadily decrease year by year in favor of road transport in many countries.

1. Data used and definitions

Transport data from OECD <https://data.oecd.org/>

Freight transport (indicator) doi: 10.1787/708eda32-en

Definition: Freight transport refers to the total movement of goods using inland transport on a given network. Data are expressed in million tonne-kilometres, which represents the transport of one tonne over one kilometre. Components for road and rail are available.

Passenger transport (indicator) doi: 10.1787/463da4d1-en

Definition: Passenger transport refers to the total movement of passengers using inland transport on a given network. Data are expressed in million passenger-kilometres, which represents the transport of a passenger for one kilometre. Components for road and rail are available.

Infrastructure investment (indicator) doi: 10.1787/b06ce3ad-en

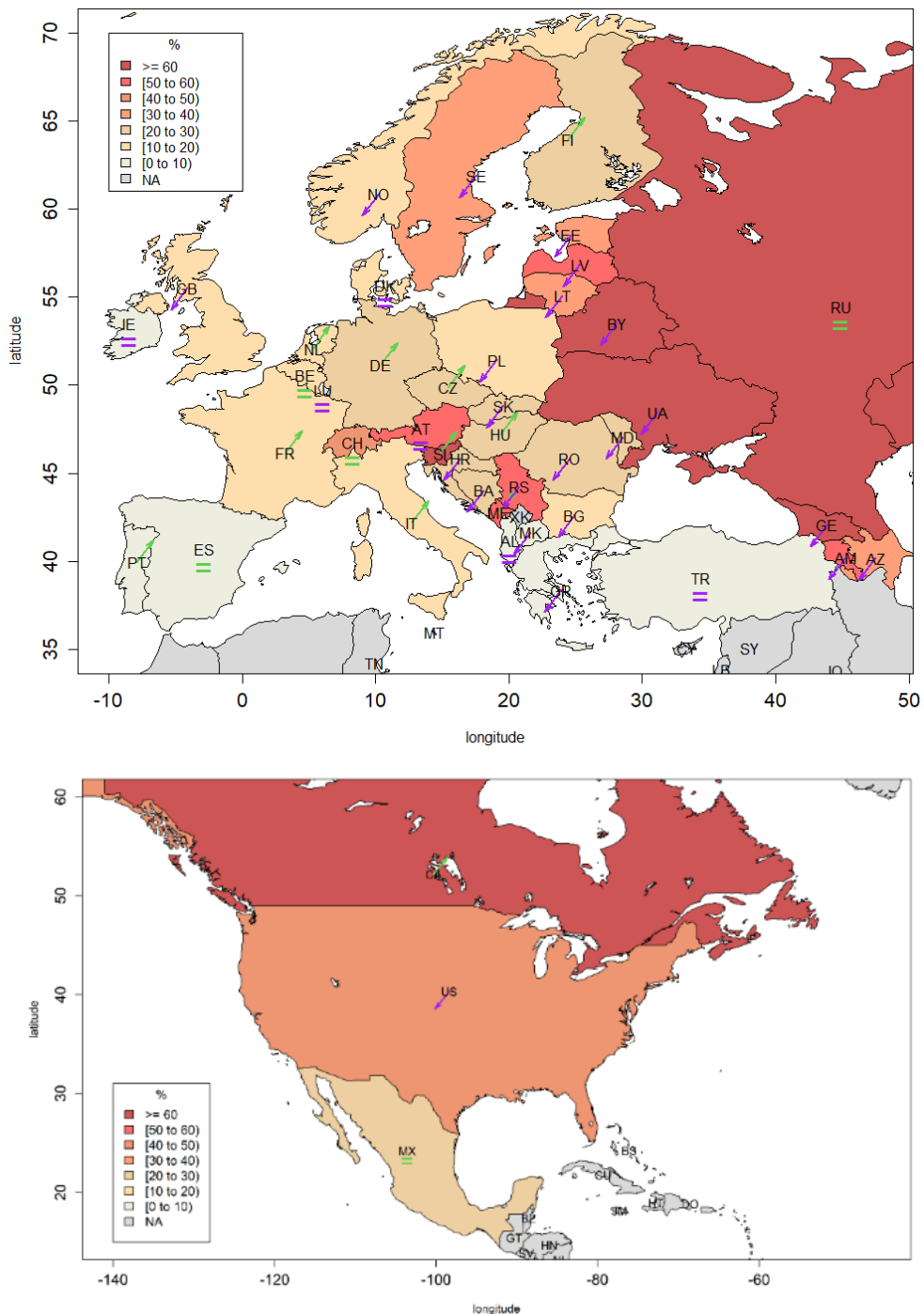
Definition: Infrastructure investment covers spending on new transport construction and the improvement of the existing network. Infrastructure investment is a key determinant of performance in the transport sector. Inland infrastructure includes road, rail, inland waterways, maritime ports and airports and takes account of all sources of financing. Efficient transport infrastructure provides economic and social benefits to both advanced and emerging economies by: improving market accessibility and productivity, ensuring balanced regional economic development, creating employment, promoting labour mobility and connecting communities. This indicator is measured as a share of GDP for total inland investment and in euros for the road, rail, air, inland waterways and sea components.

In this analytical memo, the modal share of rail in inland transport is assessed, focusing solely on rail and road data. Inland waterway and pipeline data have been excluded due to numerous missing values, as well as due to the lack of public pipeline data availability in many countries. In this context, “inland transport” refers to rail and road. Our trend analysis covers the period from 2007 to 2021.

2. Freight transport

In the EU-27, over the past 15 years, approximately 19% of inland freight transport has been carried out by rail (see Fig. 1). This proportion remained relatively stable from 2007 to 2016, hovering around 20%. However, in subsequent years, there was a slight decline, with rail transport accounting for 17% and 18% in 2020 and 2021, respectively.

On the other hand, in Russia, Belarus, Ukraine, and Georgia, rail freight transport constitutes more than 60% of inland tonne-kilometres (Tkm). However, the trend has been negative in all of these countries, except for in Russia, where the rail market share has remained stable at approximately 90%, which is substantial.



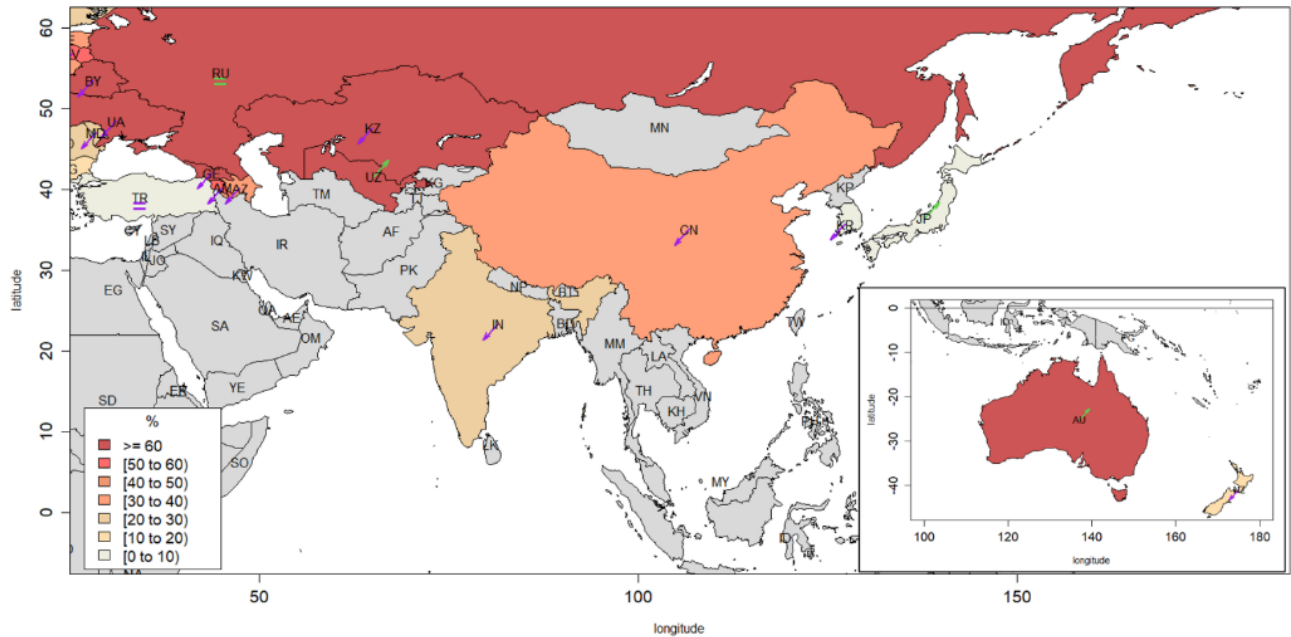


Fig.1: Proportion of inland freight transport carried by rail. Data source: OECD, Tkm.

Note: due to missing values, the mean proportion allocated to rail and the linear positive/negative trends (green/purple arrows, "=" signifies a variation < |1%|) have been assessed over the last 15 years (2007-2021).

In North America, the modal share of rail freight has varied from year to year at around 46%. Nevertheless, since 2016, a drop has been recorded with a share of approximately 42% in 2020 and 2021. The trends in Canada and the US differ significantly, with a slight increase for Canada (+1.5 percentage points over the period) and a significant drop for the US (-6 percentage points over the period). In China and India, the modal share of rail freight has witnessed a substantial decrease over the past 15 years, declining from 68% in 2007 to 34% in 2021 in China, and from 36% to 21% in India. In contrast, in Australia, rail's share has experienced significant growth, rising from 54% to 66% over the same period.

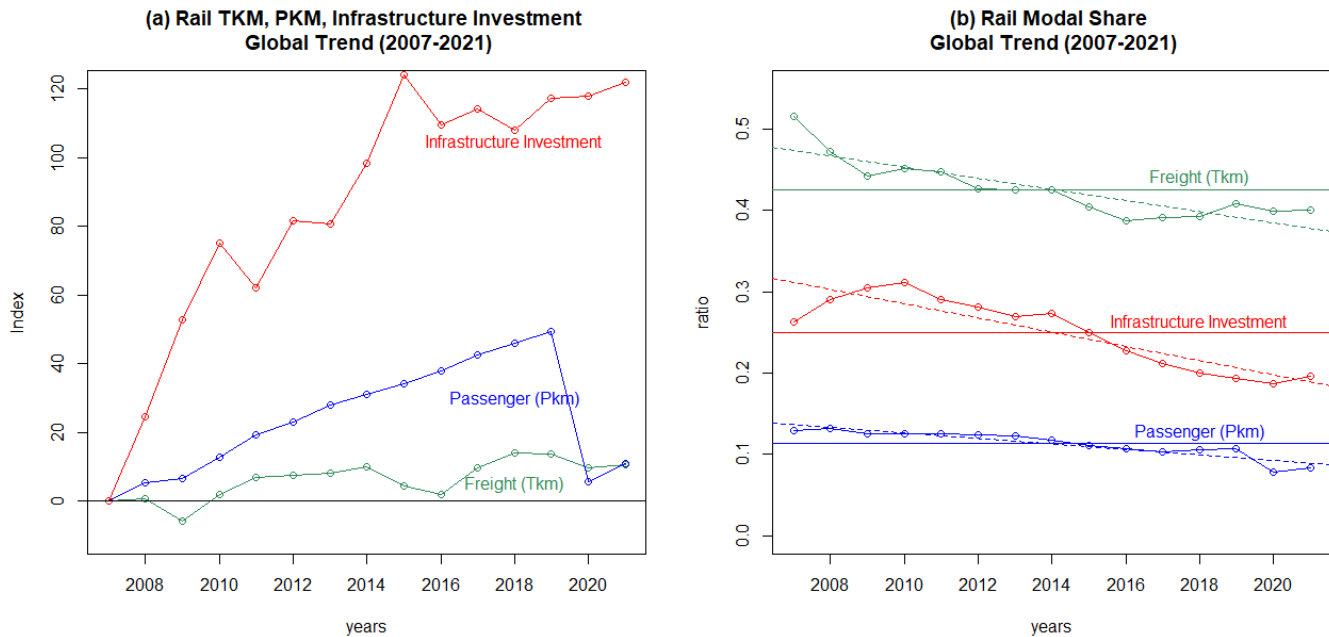
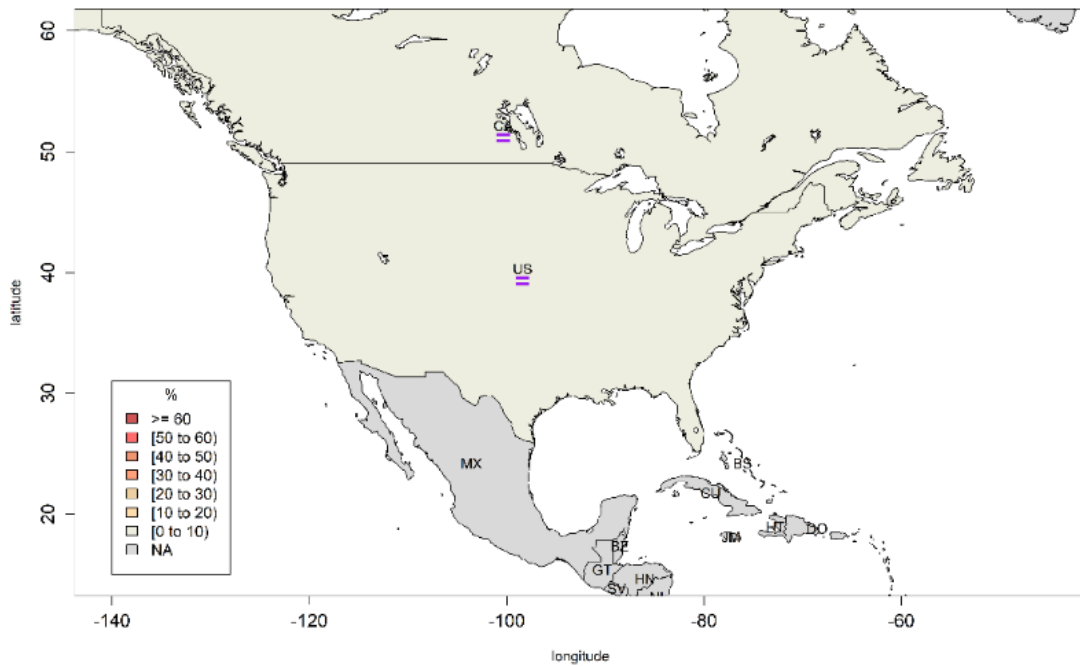
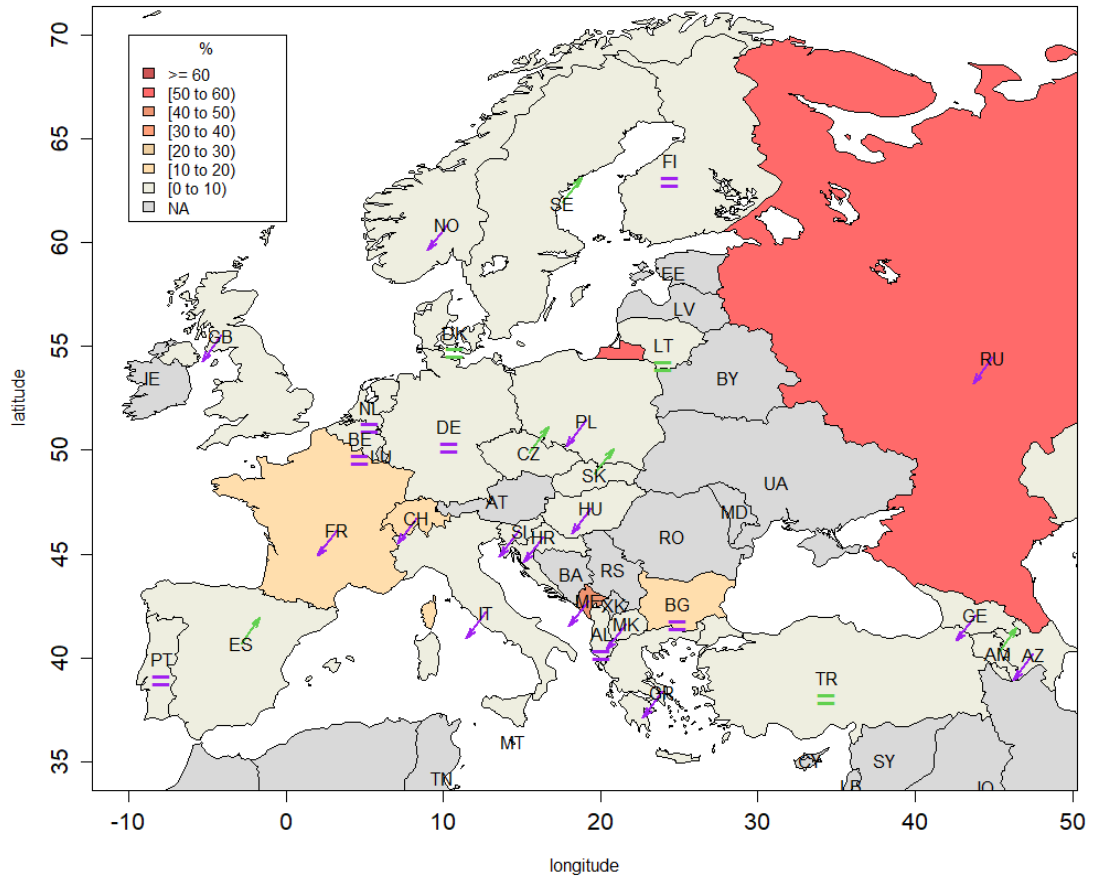


Fig.2: (a) Global trends in rail Tkm, Pkm and infrastructure investment expressed as indexes with the base reference (100) for 2007; (b) Global trends in rail the modal share of inland transport for freight (TKm) and passenger (Pkm) transport and infrastructure investment (ratio).

For a general overview, when considering all countries with available data in Europe, North America, Asia, and Oceania, the average share of rail in inland freight transport was approximately 43%. However, there has been an 11-percentage-point decrease between 2007 and 2021 (from around 51% to 40%, as the green line in Fig. 2b depicts), despite the overall growth in rail tonne-kilometres (as the green line in Fig. 2a shows). This decline can primarily be attributed to the comparatively more rapid growth of goods transported by road compared to rail, especially in China and India.

3. Passenger transport



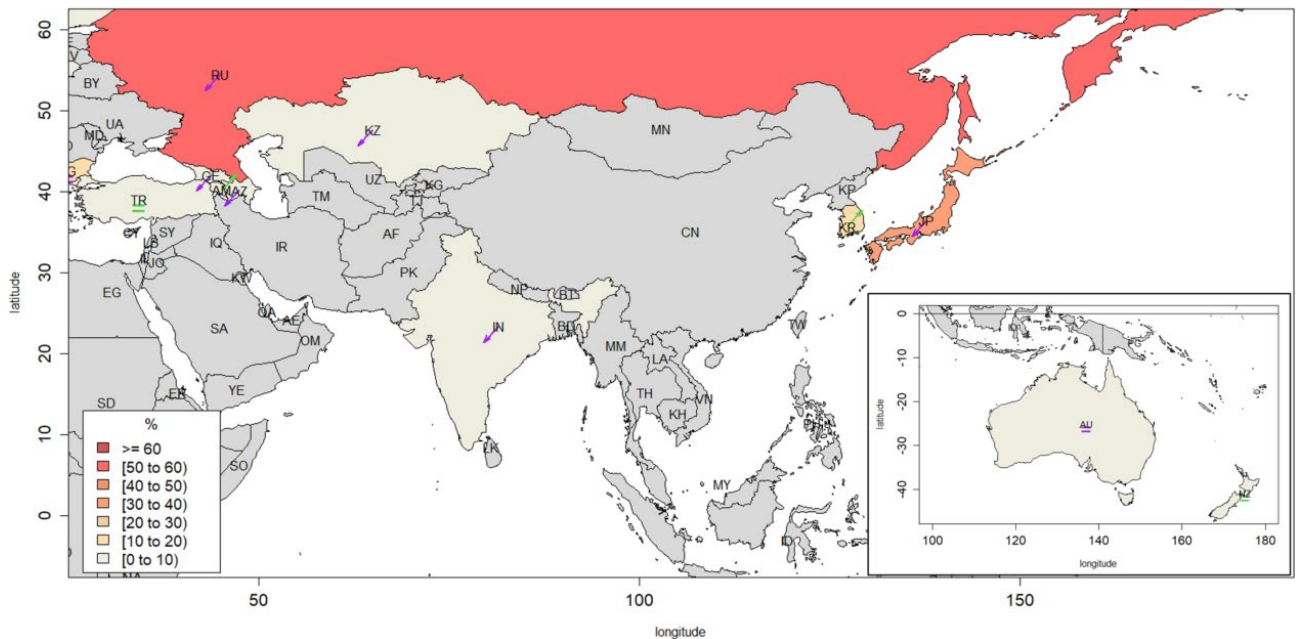


Fig.3: Proportion of inland passenger transport carried by rail. Data source: OECD, PKM. Same note as for Fig. 1.

In the EU-27, the passenger transport modal share for rail accounts for approximately 8% of total inland passenger transport (see Fig. 3), with this proportion remaining relatively stable until 2019. However, the COVID-19 pandemic significantly impacted rail passenger transport, resulting in an estimated reduced share of approximately 6% in 2020 and 2021.

In Eastern Europe, data is missing for several countries, primarily due to the absence of road passenger-kilometres (Pkm) data, as observed in Ukraine and Belarus. In Russia, rail passenger traffic experienced a downward trend over the period, along with a decreasing modal share in inland transport.

In North America, rail constitutes less than 1% of inland passenger transport.

In India, there has been a long-term decline in the share of rail passenger transport, dropping from 17% to less than 6%. In Japan, South Korea, and Australia, the rail share trend remained slightly positive until 2019, when the COVID-19 pandemic had a relatively strong impact. Unfortunately, data for road passenger-kilometres is missing in China and many other Asian countries.

Considering all countries with available data across all regions, the modal share allocated to rail accounts for about 8% of inland passenger-kilometres, with a slight negative trend being observed over the period. This was accentuated in 2020 and 2021, with a modal share of around 6% (the blue line in Fig. 2 depicts).

4. Inland transport infrastructure investment

On a global level, rail infrastructure investment increased until 2010 (as shown by the red lines in Fig. 2a and Fig. 4). The trend then subsequently continued until 2015, albeit at a slower pace. Afterwards, there was a period of stagnation, with investments holding steady at around 200 billion euros per year. In contrast, investment growth in road infrastructure experienced a more substantial and rapid increase, especially from 2015 onwards (as indicated in Fig. 4).

This observed trend aligns with a general decrease in the modal share of rail infrastructure investment over the period (as shown by the red line in Fig. 2b). In more detail, there was a slight modal share increase, from 26% in 2007 to 31% in 2010. However, this was followed by a gradual decline until 2020, and a subsequent stabilisation at approximately 19% in 2021.

Global Investment in Rail and Road Infrastructure

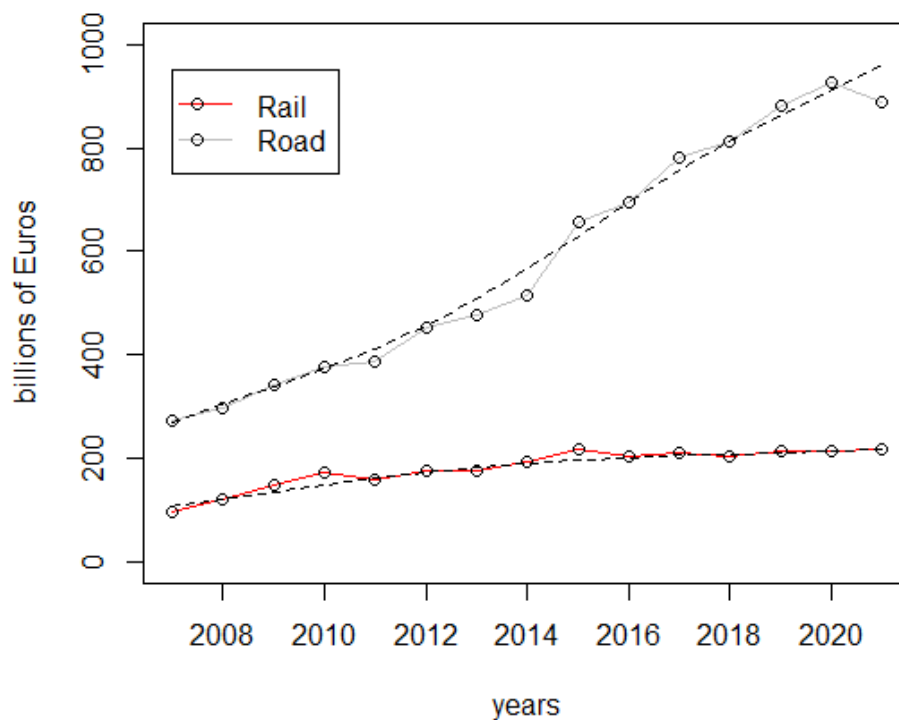
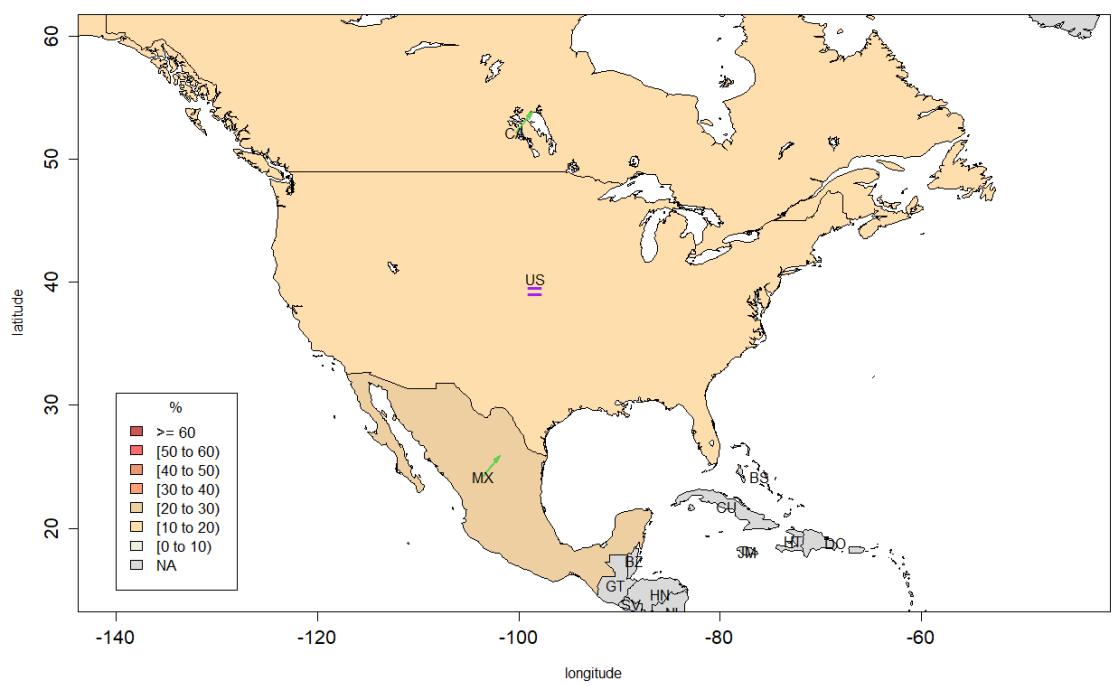
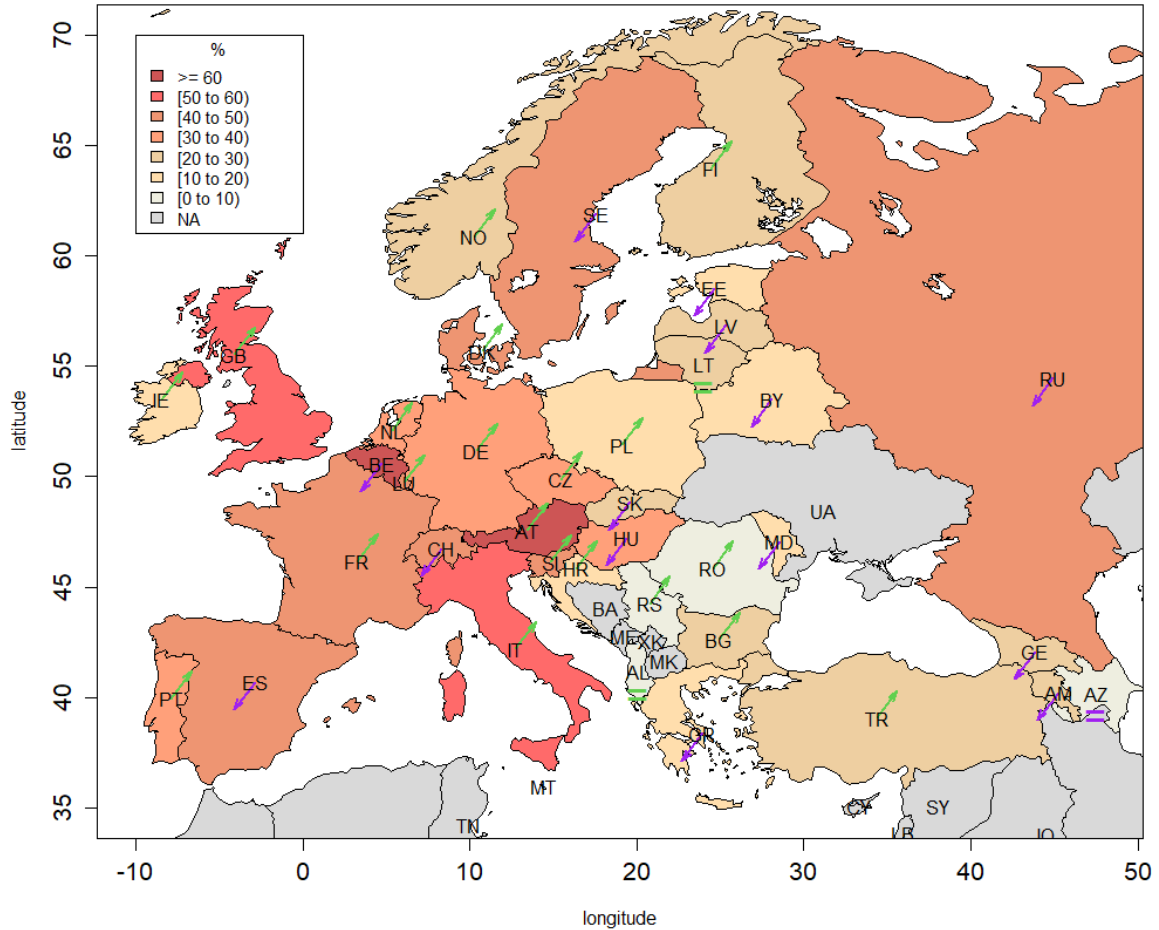


Fig.4: Global investment in rail and road infrastructure (2007-2021)

In Australia and Japan, the modal share of rail in inland transport infrastructure investment has increased, while it has significantly decreased in China, and to a lesser extent, in India.

In North America, rail accounts for approximately 12% on average of total inland transport infrastructure investment for the 2007-2021 period. However, there was a slight decrease (approximately 10%) observed in 2020.

A similar decrease was recorded in Eastern Europe, including countries such as Russia, Belarus, Moldova, and Georgia.



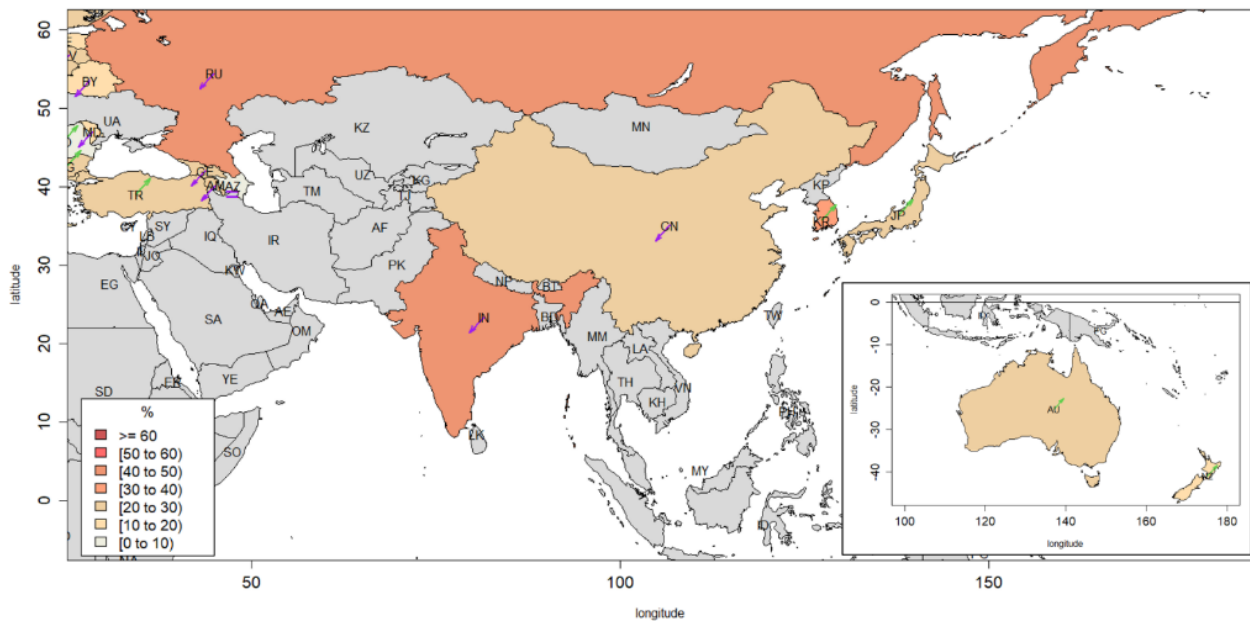


Fig.5: Proportion of inland transport infrastructure investment dedicated to rail. Data source: OECD, Euros. Same note as for Fig.1.

On the other hand, in the EU-27, the share of rail in inland transport infrastructure investment averaged 38% of the total, with a marked increase being observed over the period, reaching 46% in 2021. This increase was particularly significant in countries like Slovenia, Denmark, France, and Portugal, where there was a growth of more than 20 percentage points over the last 15 years.

Ref. see also: <https://www.itf-oecd.org/compare-transport-infrastructure-investment#05>