Economic Commission for Europe
Inland Transport Committee
Working Party on Rail Transport
Group of Experts on Permanent Identification of Railway Rolling Stock
First session
Geneva, 2–4 September 2020
Item 3 of the provisional agenda
Background to the Group

Luxembourg Rail Protocol: estimated impact on rolling stock financing cost in Europe

Submitted by Rail Working Group
Luxembourg Rail Protocol: estimated impact on rolling stock financing cost in Europe

Prepared for

[Logo: Rail Working Group]
Objectives

1. Develop a solid evidence base with 20 countries across Europe
2. Develop a robust assessment of economic benefits, based on the evidence
3. Help RWG, UNIDROIT and their members to consider the country and market impact of the Protocol
4. Help governments consider the effect of the Protocol before its adoption
5. Complement the legal analysis supporting implementation / adoption of the Protocol
Summary

Direct micro-benefits from 20 countries assessed at €19.4bn

Many additional micro and macro benefits expected in addition
Global market volume of the rail industry of €159bn per annum, including €54bn in rolling stock.

Total market for rail supply is set to continue its growth of recent years at 2.6% per year.

Growth in the rail market is currently constrained by the availability of funding.

Luxembourg Rail Protocol improves availability of funds.

Contents

1. Benefits from the Luxembourg Rail Protocol
2. Assessing direct financing cost reductions: methodology
3. Country case studies
Benefits from the Luxembourg Rail Protocol (LRP)
The Luxembourg Rail Protocol (LRP)

Financing the rail industry

- **Investors**
  - Interest / Dividend
  - Loan / Equity

- **Legal owner / Lender**
  - Finance payment
  - Right to use asset
  - Title

- **Train operator / Lessee**
  - Services

- **Consumers (passengers / businesses)**

Issue with bringing in private capital due to:
- uncertainty around the repossession of collateral for creditors
- limited legal infrastructure and tracking of assets
- cross border risks, no international registry
- no common system for identifying railway equipment worldwide

Solution: Luxembourg Rail Protocol
New global legal systems for the recognition and prioritisation of security interests held by creditors

**Debtors covered**
- all debtors in ratifying state

**Vehicles covered**
- all vehicles running on tracks or above, on, or under a guideway

**Financing covered**
- Secured credit agreements
- Conditional sales contract
- Leases
Features of LRP deliver both micro- and macro- benefits

**Single central global registry**
- Facilitates local recording, international interests and universal numbering system
- Establishes clear priority among creditors
- Provides for real time monitoring – creditors can check rival claims to related rail equipment
- Eliminates unnecessary restructuring of security interests as transactions change

**Clear legal framework and enforcement**
- Covers contracting states and all debtors therein without differentiating across the type of financing structures
- Provides for clear creditor rights on termination, default, and insolvency
- Recognises and regulates the security interests of financiers and other parties
- Opens the way to secured finance with recourse only to the assets

**DIRECT MICRO-BENEFITS**

**INDIRECT MICRO-BENEFITS**

**MACRO-BENEFITS**

Not quantified

Not quantified
LRP will reduce costs and help growth in rail transport

**Macro trends**
- Population growth
- Environmental regulation
- Technological progress

**Financing process**
- Budget constraints lead to under-investment
- Public investment
- Lightly capitalised operators
- Increased procurement needs

**Outcome**
- Economy suffering from market failure
- Easing of budget constraint
- Access to new financial resources at lower costs:
  - Private investment
  - Inward investment
  - Asset class financing
- Increase in rail transportation, at lower unit cost

**DIRECT MICRO BENEFITS**
- Reduced risks and costs

**INDIRECT MICRO BENEFITS**
- Increased commercial participation in financing

**MACRO BENEFITS**
- Reduction in carbon emissions
- Lower unemployment
- Increased productivity and GDP
- Increased transport safety
This study focuses on the direct micro-level benefits

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**Luxembourg Rail Protocol**

- Easier repossession of collateral on default
- Improved and standardized legal and operational frameworks across borders

**Direct micro-level benefits**

- Reduced risk for creditors
- Reduced transaction costs
- Reduced financial costs for train operator

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**Indirect micro-level benefits**

- Facilitates operating leases
  - Opens up the market to new competition
  - Drives standardisation of equipment and economies of scale in manufacturing
- Potentially cuts Export Credit Agency finance premia following the Aircraft Protocol
- Enables unique global identifier enabling tracking and leading to insurance, maintenance, and many other cost savings
- Registration of creditor claims provides cross-border creditor protection even if no ratification in the state

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**Macro benefits**

- Better value for money for customers
Assessing direct financing cost reductions: methodology
Methodological approach

Investors

<table>
<thead>
<tr>
<th>Interest &amp; dividends</th>
</tr>
</thead>
<tbody>
<tr>
<td>Train operator / Lessee</td>
</tr>
</tbody>
</table>

Services

| Consumers (passengers / businesses) |

Financial benefits from reduced risk

\[
\text{Cost savings} = \text{Investment} \times (\text{Pre-LRP cost of capital} - \text{Post-LRP cost of capital})
\]

Step 1

Step 2

Step 3

Step 4

Better value for money
Step 1: Investment to finance

Key assumptions

- **Investment:** assume that both the financing of new rolling stock and the refinancing of the current fleet are affected by the ratification of the LRP. Refinancing occurs when the age of a RS unit reaches 10 years or 20 years.

- **Source of financing:** assume that (i) only private financing benefits from the LRP; (ii) the share of public financing will decrease by half by 2023 due to the catalyst effect of the LRP and then remain constant from 2023 onwards.

- **Periods:** forecast from 2018 to 2047 – terminal value calculated at 2047.

2018-2022: forecasts of new deliveries are assumed to offset retirements based on assumed asset life of 30 years.

2023-2032: model a catch-up period of higher deliveries for countries where average age of fleet exceeds 20 years, i.e. where the LRP will unlock new finance and deliveries to replace aging fleet.

**Investment**

Financing using LRP

Financing new rolling stock

Freight

Passenger

**Data (sources)**

<table>
<thead>
<tr>
<th>Year Interval</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-2022</td>
<td>Average annual market value of deliveries by type of RS by country (SCI Verkehr data)</td>
</tr>
<tr>
<td>2023-2032</td>
<td>Theoretical CAGR over a 10-year-period to account for catch-up when average fleet age &gt; 20 years (assumption)</td>
</tr>
<tr>
<td>2033-2047</td>
<td>Steady state with annual market value growing with inflation in the EU (2%) (assumption)</td>
</tr>
<tr>
<td>2048 onwards</td>
<td>Growing into perpetuity using inflation as growth rate, and discounted at the pre-LRP WACC (assumption)</td>
</tr>
</tbody>
</table>
Catch-up through reducing average age of fleet
Rational and methodology

Assets older than 40 years assumed to be gradually retired

Average fleet age therefore gradually reduces to 20 years

Countries with younger fleets

Countries with older fleets

Luxembourg Rail Protocol

Increase in access to private financing for all operators

Higher rate of investment in new fleet over a catch-up period of 10 years until the average fleet age is 20 years
Catch-up through reducing average age of fleet

**Catch-up effect**

Average fleet age assumed to be reduced to 20 years (i.e. based on 40 years asset life) over 10 years, which drives additional fleet replacement.

- **Countries with oldest fleets**: Romania, Hungary, Bulgaria, Poland, Slovakia, Spain, Italy, France, Ukraine, Finland, Germany, Czech Republic, Denmark, Turkey, United Kingdom.

- **Countries with youngest fleets**: no catch-up.
Step 2: pre-LRP cost of capital

Pre-LRP cost of capital

Cost of equity

Levered beta \times\text{ Equity risk premium} + \text{ Domestic sovereign yield adjusted for inflation}

\text{Cost of debt}

\text{Sovereign yield adjusted for inflation} + \text{ Loan margin}

\text{Beta based on the European railroad transportation industry}

\text{Equity risk premium for a mature equity market}

\text{Yield on domestic government bond, adjusted by:}
- difference between long-term forecast of domestic inflation and ECB target (to account for expected exchange rate depreciation / appreciation vs euro)
- country risk premium is implicit in the domestic sovereign yield

\text{Loan margins by credit rating for low collateralisation used by the EC in State aid cases}
Step 3: post-LRP cost of capital

Cost of equity

- Levered beta
- Equity risk premium
- Risk-free rate adjusted for inflation and country risk premium

Cost of debt

- Risk-free rate adjusted for inflation and country risk premium
- Loan margin

Margin reductions for higher collateralisation

<table>
<thead>
<tr>
<th>OECD country risk classification for export credits</th>
<th>Reduction in margin from low to high collateralisation (in bp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-income OECD country</td>
<td>40</td>
</tr>
<tr>
<td>Grade 3</td>
<td>145</td>
</tr>
<tr>
<td>Grade 4</td>
<td>300</td>
</tr>
<tr>
<td>Grade 7</td>
<td>600</td>
</tr>
</tbody>
</table>

Risk reduction (not quantified)

Risk reduction (quantified)

Lower transaction costs assumption -10bp

Cost of capital savings (in bp)

- Minimum: 40
- Average: 80
- Maximum: 450
Step 4: Financial benefits

2018-2047

Cost of financing pre-LRP
Cost of capital pre-LRP \times \text{invested capital}

- Cost of financing post-LRP
Cost of capital post-LRP \times \text{invested capital}

= Annual financial benefits

discounting

Present value of financial benefits over the period

2048 onwards

Financial benefits in 2047 for investment in new rolling stock
growing in perpetuity

growth rate: inflation
pre-LRP WACC

discounting

Terminal value of financial benefits from 2048 onwards in present value terms
Country case studies
FINANCIAL BENEFITS

20 countries
€19.4bn total benefits

Refinancing 16%
Freight 12%
New deliveries 84%
Passengers 88%

Financial savings by country in billions of Euros:
- UK 3.5
- FR 2.7
- DE 3.9
- NL 0.8
- AT 1.2
- CH 1.5
- ES 0.3
- IT 0.6
- SE 0.6
- FI 0.2
- PL 0.5
- RO 0.3
- SK 0.2
- HU 0.1
- CZ 0.5
- BU 0.2
- UA 0.9
- TR 0.9
- BE 0.3
- DK 0.1
- NL 0.4
Country case studies 1/5

Present value of total savings

UK

€3,546m
€54 per

ES

€336m
€7 per

IT

€2,738m
€41 per

€1,243m
€21 per

FR

€2,526m
€213m

Present value of total savings

Freight

Passengers

Present value of total savings

Freight

Passengers

Present value of total savings

Freight

Passengers

Present value of total savings

Freight

Passengers
Country case studies 2/5

Present value of total savings

**BE**
€289m
€25 per

**NL**
€833m
€49 per

**DE**
€3,866m
€47 per

**CH**
€1,518 m
€181 per
### Country case studies 3/5

<table>
<thead>
<tr>
<th>Country</th>
<th>Present value of total savings</th>
<th>Present value of total savings (per)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CZ</td>
<td>€429m</td>
<td>€41 per 1</td>
</tr>
<tr>
<td>SK</td>
<td>€231 m</td>
<td>€43 per 1</td>
</tr>
<tr>
<td>AT</td>
<td>€561m</td>
<td>€64 per 1</td>
</tr>
<tr>
<td>HU</td>
<td>€135 m</td>
<td>€14 per 1</td>
</tr>
</tbody>
</table>

#### Breakdown by Freight and Passengers

<table>
<thead>
<tr>
<th>Country</th>
<th>Freight</th>
<th>Passengers</th>
</tr>
</thead>
<tbody>
<tr>
<td>CZ</td>
<td>€347m</td>
<td>€82m</td>
</tr>
<tr>
<td>SK</td>
<td>€207m</td>
<td>€24m</td>
</tr>
<tr>
<td>AT</td>
<td>€463m</td>
<td>€98m</td>
</tr>
<tr>
<td>HU</td>
<td>€128m</td>
<td>€7m</td>
</tr>
</tbody>
</table>
Country case studies 4/5

<table>
<thead>
<tr>
<th>Country</th>
<th>Present value of total savings</th>
<th>€517m</th>
<th>€14 per</th>
</tr>
</thead>
<tbody>
<tr>
<td>PL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SE</td>
<td>Present value of total savings</td>
<td>€553m</td>
<td>€56 per</td>
</tr>
<tr>
<td>DK</td>
<td>Present value of total savings</td>
<td>€113m</td>
<td>€20 per</td>
</tr>
<tr>
<td>FI</td>
<td>Present value of total savings</td>
<td>€230m</td>
<td>€42 per</td>
</tr>
</tbody>
</table>

Present value of total savings:
- €517m
- €113m
- €230m

Freight: €80m
Passengers: €37m
Freight: €2m
Passengers: €42m
Country case studies 5/5

Present value of total savings
€934m
€21 per

Present value of total savings
€853m
€11 per

Present value of total savings
€251m
€13 per

Present value of total savings
€247m
€35 per

Passengers   Freight

UA

TR

RO

BU

Passengers   Freight

Present value of total savings
€413m  €521m

Present value of total savings
€571m  €283m

Present value of total savings
€223m  €28m

Present value of total savings
€223m  €23m