Luxembourg Rail Protocol: estimated impact on rolling stock financing cost in countries using the 1520 gauge

Prepared for

RAIL WORKING GROUP
Objectives

1. Develop a solid evidence base with 9 countries using the 1520 gauge
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 9 countries assessed at €13.9bn

Many additional micro and macro benefits expected
Context

1. Global market volume of the rail industry of €159bn per annum, including €54bn in rolling stock.

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

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

4. 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**
  - Payment
  - Title
- **Train operator / Lessee**
  - Finance payment
  - Right to use asset
- **Consumers (passengers / businesses)**
  - Services

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

Financing covered
- Secured credit agreements
- Conditional sales contract
- Leases

Vehicles covered
- all vehicles running on tracks or above, on, or under a guideway
## Features of LRP deliver both micro- and macro- benefits

<table>
<thead>
<tr>
<th>Single central global registry</th>
<th>Clear legal framework and enforcement</th>
</tr>
</thead>
<tbody>
<tr>
<td>• <strong>Facilitates</strong> local <em>recording</em>, international interests and universal numbering system</td>
<td>• <strong>Covers contracting states and all debtors therein</strong> without differentiating across the type of financing structures</td>
</tr>
<tr>
<td>• Establishes <strong>clear priority</strong> among <em>creditors</em></td>
<td>• Provides for <strong>clear creditor rights</strong> on termination, default, and insolvency</td>
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<tr>
<td>• Provides for <strong>real time monitoring</strong> – creditors can check rival claims to related rail equipment</td>
<td>• Recognises and regulates the <strong>security interests</strong> of financiers and other parties</td>
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</table>
| • **Eliminates unnecessary restructuring** of security interests as transactions change | • Opens the way to **secured finance** with recourse only to the *assets*

**DIRECT MICRO-BENEFITS**

**INDIRECT MICRO-BENEFITS**

**MACRO-BENEFITS**

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

<table>
<thead>
<tr>
<th>Macro trends</th>
<th>Financing process</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population growth</td>
<td>Budget constraints lead to under-investment</td>
<td>Economy suffering from market failure</td>
</tr>
<tr>
<td>Environmental regulation</td>
<td>Technological progress</td>
<td></td>
</tr>
<tr>
<td>Increased procurement needs</td>
<td>Public investment</td>
<td>Lightly capitalised operators</td>
</tr>
<tr>
<td>DIRECT MICRO BENEFITS</td>
<td>Easing of budget constraint</td>
<td></td>
</tr>
<tr>
<td>Reduced risks and costs</td>
<td>Access to new financial resources at lower costs:</td>
<td>Increase in rail transportation, at lower unit cost</td>
</tr>
<tr>
<td>INDIRECT MICRO BENEFITS</td>
<td>• Private investment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Inward investment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Asset class financing</td>
<td></td>
</tr>
<tr>
<td>MACRO BENEFITS</td>
<td>Increased commercial participation in financing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Reduction in carbon emissions</td>
<td></td>
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<tr>
<td></td>
<td>• Lower unemployment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Increased productivity and GDP</td>
<td></td>
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<tr>
<td></td>
<td>• Increased transport safety</td>
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</tbody>
</table>
This study focuses on the direct micro-level benefits

**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
- Better value for money for customers

**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

**Macro benefits**
- Not quantified
Assessing direct financing cost reductions: methodology
Methodological approach

Investors

Risk reduction

Financial benefits from reduced risk

Cost savings = Investment \times (Pre-LRP cost of capital - Post-LRP cost of capital)

Step 4

Step 1

Step 2

Step 3

Train operator / Lessee

Services

Consumers (passengers / businesses)

Better value for money

Step 1

Step 2

Step 3
**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>Period</th>
<th>2018-2022</th>
<th>2023-2032</th>
<th>2033-2047</th>
<th>2048 onwards</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Investment</strong></td>
<td>Average annual market value of deliveries by type of RS by country (SCI Verkehr data)</td>
<td>Theoretical CAGR over a 10-year-period to account for catch-up when average fleet age &gt; 20 years (assumption)</td>
<td>Steady state with annual market value growing with inflation in the EU (2%) (assumption)</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
Rationale 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

Luxembourg Rail Protocol

Increase in access to private financing for all operators

Countries with older fleets

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

1 For Ukraine, over the assumed period of ten years, the catch-up effect resulting from the fleet's age is an additional fleet replacement of 1.4% per year.
Step 2: pre-LRP cost of capital

Pre-LRP cost of capital

Cost of equity

Levered beta × Equity risk premium + Domestic sovereign yield adjusted for inflation

Cost of debt

Sovereign yield adjusted for inflation + Loan margin

Beta based on the European railroad transportation industry

Equity risk premium for a mature equity market

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

Loan margins by credit rating for low collateralisation used by the EC in State aid cases

1 Due to data availability, the sovereign yield of Slovakia was used for the Baltic countries, and the yield of Turkey was used for Azerbaijan, Belarus, Georgia, and Kazakhstan. National inflation forecasts were used to adjust for inflation.
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

Risk reduction (not quantified)

Cost of debt

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

Risk reduction (quantified)

Post-LRP cost of capital

Lower transaction costs (quantified)

- assumption -10bp

Cost of capital savings (in bp)

- minimum 40
- average 230
- maximum 450

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>
Step 4: Financial benefits

2018-2047

Cost of financing pre-LRP
Cost of capital pre-LRP x invested capital

Cost of financing post-LRP
Cost of capital post-LRP x invested capital

Annual financial benefits

2048 onwards

Financial benefits in 2047 for investment in new rolling stock

- growing in perpetuity
  - growth rate: inflation
  - pre-LRP WACC

Present value of financial benefits over the period

Terminal value of financial benefits from 2048 onwards in present value terms

- discounting

Investment to finance | Pre-LRP cost of capital | Post-LRP cost of capital | Financial benefits
Country case studies
FINANCIAL BENEFITS

9 countries

€13.9bn total benefits

Refinancing 24%

New deliveries 76%

Freight 51%

Passengers 49%

Financial savings by country in billions of Euros

- RU 11.6
- UA 0.9
- GE <0.1
- AZ <0.1
- KZ 0.8
- LT <0.1
- BY 0.2
- EE <0.1

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Benefits will build up over time

Cumulated discounted benefits from the LRP in the 9 countries (€bn)

Sources: Oxera analysis, based on data from SCI Verkehr.
Country case studies 1/3

Present value of total savings
€255m
€26 per

Present value of total savings
€186m
€69m

Present value of total savings
€188m
€20 per

Present value of total savings
€132m
€56m

Passengers
Freight

Passengers
Freight

Passengers
Freight
Country case studies 2/3

Present value of total savings

**GE**
- €33m
- €6 per

- **Passengers**
  - Present value of total savings
  - €21m
- **Freight**
  - Present value of total savings
  - €13m

**LT**
- €16m
- €6 per

- **Passengers**
  - Present value of total savings
  - €12m
- **Freight**
  - Present value of total savings
  - €4m

**LV**
- €33m
- €17 per

- **Passengers**
  - Present value of total savings
  - €26m
- **Freight**
  - Present value of total savings
  - €8m
Country case studies 3/3

**KZ**

<table>
<thead>
<tr>
<th></th>
<th>Present value of total savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passengers</td>
<td>€363m</td>
</tr>
<tr>
<td>Freight</td>
<td>€483m</td>
</tr>
</tbody>
</table>

**UA**

<table>
<thead>
<tr>
<th></th>
<th>Present value of total savings</th>
</tr>
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<tbody>
<tr>
<td>Passengers</td>
<td>€413m</td>
</tr>
<tr>
<td>Freight</td>
<td>€521m</td>
</tr>
</tbody>
</table>

**RU**

<table>
<thead>
<tr>
<th></th>
<th>Present value of total savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passengers</td>
<td>€5,659m</td>
</tr>
<tr>
<td>Freight</td>
<td>€5,947m</td>
</tr>
</tbody>
</table>

Present value of total savings:
- KZ: €846m (€48 per)
- UA: €934m (€21 per)
- RU: €11,606m (€80 per)