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

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

Prepared for

oxera
compelling economics
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 in addition
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

Rolling stock manufacturer

Train operator / Lessee
- Finance payment
- Right to use asset

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**
- [Text]

**INDIRECT MICRO-BENEFITS**
- [Text]

**MACRO-BENEFITS**
- [Text] 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
- Easing of budget constraint
- Increased commercial participation in financing

**Outcome**
- Lightly capitalised operators
- Economy suffering from market failure

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

**INDIRECT MICRO BENEFITS**
- Access to new financial resources at lower costs:
  - Private investment
  - Inward investment
  - Asset class 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

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

Indirect micro-level benefits

- 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
- 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

Macro benefits

- Better value for money for customers

Not quantified
Assessing direct financing cost reductions: methodology
Methodological approach

**Financial benefits from reduced risk**

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

**Step 1**
- Investment

**Step 2**
- Pre-LRP cost of capital

**Step 3**
- Post-LRP cost of capital

**Step 4**
- Cost savings

**Risk reduction**

**Better value for money**

**Consumers (passengers / businesses)**

**Train operator / Lessee**

**Investors**

Interest & dividends
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.

### Financing using LRP

**Freight**

**Passenger**

### Data (sources)

<table>
<thead>
<tr>
<th></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

Countries with older fleets¹

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

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

\[
\text{Cost of equity: } \frac{E}{D+E} \times \text{Beta based on the European railroad transportation industry} + \text{Equity risk premium for a mature equity market} + \text{Domestic sovereign yield adjusted for inflation}
\]

\[
\text{Cost of debt: } \frac{D}{D+E} + \text{Sovereign yield adjusted for inflation} + \text{Loan margin}
\]

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

Post-LRP cost of capital

Cost of debt

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

Risk reduction
(not quantified)

Risk reduction
(quantified)

Margin reductions for higher collateralisation

OECD country risk classification for export credits

- High-income OECD country
- Grade 3
- Grade 4
- Grade 7

Reduction in margin from low to high collateralisation (in bp)

- 40
- 145
- 300
- 600

Lower transaction costs (quantified)

assumption -10bp

Cost of capital savings (in bp)

- minimum
- average
- maximum

- 40
- 230
- 450

Investment to finance
Pre-LRP cost of capital
Post-LRP cost of capital
Financial benefits
**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** = 

Present value of financial benefits over the period

### 2048 onwards

- **Financial benefits in 2047 for investment in new rolling stock**
  - growing in perpetuity
  - discounting

- **Terminal value of financial benefits from 2048 onwards in present value terms**
  - growth rate: inflation
  - pre-LRP WACC

**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
- KZ: 0.8
- GE: <0.1
- AZ: 0.3
- LT: <0.1
- BY: 0.2
- UA: 0.9
- LV: <0.1
Country case studies 1/3

Present value of total savings
€255m
€26 per

Present value of total savings
€4m
€3 per

Present value of total savings
€186m
€69m

Present value of total savings
€132m
€56m
Country case studies 2/3

**Present value of total savings**

**GE**
- €33m
- €9 per

<table>
<thead>
<tr>
<th>Passengers</th>
<th>Freight</th>
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<tr>
<td>€21m</td>
<td>€13m</td>
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**LT**
- €16m
- €6 per

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<tr>
<td>€12m</td>
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**Present value of total savings**

**LV**
- €33m
- €17 per

<table>
<thead>
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<th>Passengers</th>
<th>Freight</th>
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<tbody>
<tr>
<td>€26m</td>
<td>€8m</td>
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Country case studies 3/3

RU

Present value of total savings
€11,606m
€80 per

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<th>Passengers</th>
<th>Freight</th>
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<td>€363m</td>
<td>€483m</td>
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UA

Present value of total savings
€934m
€21 per

<table>
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<th>Passengers</th>
<th>Freight</th>
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<tbody>
<tr>
<td>€413m</td>
<td>€521m</td>
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</table>

KZ

Present value of total savings
€846m
€48 per

<table>
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<th>Passengers</th>
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