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

Prepared for

RAIL WORKING GROUP

oxera compelling economics
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
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)**

**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

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**DIRECT MICRO-BENEFITS**

**INDIRECT MICRO-BENEFITS**

**MACRO-BENEFITS**

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

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

**Financing process**
- Increased procurement needs
- Budget constraints lead to under-investment
- Public investment
- Lightly capitalised operators
- Access to new financial resources at lower costs:
  - Private investment
  - Inward investment
  - Asset class financing
- Easing of budget constraint
- Increased commercial participation in financing

**Outcome**
- Economy suffering from market failure
- Increase in rail transportation, at lower unit cost
- 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
- Better value for money for customers
- Macro benefits

**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
Assessing direct financing cost reductions: methodology
Methodological approach

Investors

Risk reduction

Financial benefits from reduced risk

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

Step 1: Investment
Step 2: Pre-LRP cost of capital
Step 3: Post-LRP cost of capital
Step 4: Cost savings

Train operator / Lessee

Services

Consumers (passengers / businesses)

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></th>
<th>2018-2022</th>
<th>2023-2032</th>
<th>2033-2047</th>
<th>2048 onwards</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>
<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

Rational and methodology

- Assets older than 40 years assumed to be gradually retired
- Average fleet age therefore gradually reduces to 20 years

<table>
<thead>
<tr>
<th>Countries with younger fleets</th>
<th>Countries with older fleets</th>
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<tbody>
<tr>
<td>🇫🇮 🇳🇴 🇸🇪 🇫🇷</td>
<td>🇧🇪 🇷🇺 🇸🇮 🇶🇦 🇺🇦 🇦🇪 🇪🇸 🇮🇹 🇫🇷</td>
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<tr>
<th>Luxembourg Rail Protocol</th>
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<tbody>
<tr>
<td>Increase in access to private financing for all operators</td>
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</tbody>
</table>

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: 5.9%
- Hungary: 5.5%
- Bulgaria: 3.9%
- Poland: 3.5%
- Slovakia: 3.1%
- Spain: 2.9%
- Italy: 2.3%
- France: 1.5%
- Ukraine: 1.4%
- Finland: 1.2%
- Germany: 1.0%
- Czech Republic: 0.8%
- Denmark: 0.4%
- Turkey: 0.1%
- United Kingdom: 0.1%
- Sweden: 0%
- Netherlands: 0%
- Austria: 0%
- Belgium: 0%
- Switzerland: 0%

Countries with youngest fleets: no catch-up
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

**Levered beta**
Beta based on the European railroad transportation industry

**Equity risk premium**
Equity risk premium for a mature equity market

**Domestic sovereign yield adjusted for inflation**
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

**Cost of equity**

weight: \( \frac{E}{D+E} \)

**Cost of debt**

weight: \( \frac{D}{D+E} \)

**Loan margin**
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

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 assumption
- Effective cost of capital savings (in bp)

**Margin reductions for higher collateralisation**

- OECD country risk classification for export credits
- Reduction in margin from low to high collateralisation (in bp)

- High-income OECD country
  - Grade 3: 40
  - Grade 4: 145
  - Grade 7: 300
  - Maximum: 600

- Lower transaction costs assumption: -10bp
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

discounting

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

20 countries
€19.4bn total benefits

Financial savings by country in billions of Euros

Refinancing 16%
Freight 12%
New deliveries 84%
Passengers 88%
Country case studies 1/5

Present value of total savings

**UK**
- €3,546m
- €54 per

**FR**
- €2,738m
- €41 per

**ES**
- €3,501m
- €45 per

**IT**
- €2,526m
- €213 per

- €1,243m
- €21 per

- €1,191m
- €52m
Country case studies 2/5

<table>
<thead>
<tr>
<th>Country</th>
<th>Present value of total savings</th>
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<td>€289m</td>
<td>€3,866m</td>
<td>€1,518 m</td>
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<td>€25 per</td>
<td>€47 per</td>
<td>€181 per</td>
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<tr>
<td>BE</td>
<td>€283m</td>
<td>€3,272m</td>
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<td></td>
<td>€6m</td>
<td>€595m</td>
<td>€194m</td>
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<tr>
<td>NL</td>
<td>€833m</td>
<td>€1,324m</td>
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<tr>
<td></td>
<td>€49 per</td>
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<tr>
<td>CH</td>
<td>€812m</td>
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<tr>
<td></td>
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<td>€1,324m</td>
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</tbody>
</table>
Country case studies 3/5

Present value of total savings
€429m
€41 per

CZ

Passengers Freight
Present value of total savings
€347m €82m

Present value of total savings
€561m
€64 per

AT

Passengers Freight
Present value of total savings
€463m €98m

Present value of total savings
€231 m
€43 per

SK

Passengers Freight
Present value of total savings
€207m €24m

Present value of total savings
€135 m
€14 per

HU

Passengers Freight
Present value of total savings
€128m €7m
Country case studies 4/5

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

Present value of total savings:
- €517m for PL
- €553m for SE
- €113m for DK
- €230m for FI

Passengers:
- €188m for FI

Freight:
- €42m for FI

€20 per passenger in DK
€42 per passenger in FI
Country case studies 5/5

Present value of total savings

- **UA**: €934m, €21 per
  - Passengers
  - Freight
- **RO**: €251m, €13 per
  - Passengers
  - Freight
- **TR**: €853m, €11 per
  - Passengers
  - Freight
- **BU**: €247m, €35 per
  - Passengers
  - Freight

Present value of total savings

- **UA**: €413m
- **RO**: €223m
- **TR**: €571m
- **BU**: €223m

Passengers: People
Freight: Cargo