Evaluation of the European road freight market for longer & heavier vehicles on the long haul and conclusions to new vehicle concepts

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1. Motivation

**Energy and cost efficient transport system**

Aerodynamic and Flexible Trucks for Next Generation of Long Distance Road Transport
Here: Longer Heavier Vehicles (LHVs)

**How to enable a vehicle development in line with the market requirements?**

Quantifying the European road freight market!
1. Motivation

Quantifying the European road freight market for LHVs on the long haul...

... In Europe, ~80% (tkm) of all road freight transport is moved on distances longer than 150km (Eurostat 2018)

Important segments?
Loading unit?
Degree of loading?
Type of tour?
Agenda

- 2. Data description and method of analysis
- 3. Results of the analysis
- 4. Summary and conclusions
2. Data description and method of analysis

+EFTA

Vehicle 1

Tour 1

Tour 2

Good 1

Good 2

Submit quarterly*

+ sample weights

**Eurostat**

419,000 Vehicles

4,908,000 Tours

3,488,000 Goods

Anonymised Microdata (2014)

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*Note that Malta and Iceland do not submit data. Norway, Spain and France exclude some heavy vehicles from the survey.*
3.1 Results of the analysis: Type of goods

NST 2007 classification:

- **01** Products of agriculture, hunting, and forestry; fish and other fishing products
- **04** Food products, beverages and tobacco
- **06** Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products; printed matter and recorded media
- **08** Chemicals, chemical products, and man-made fibers; rubber and plastic products; nuclear fuel
- **09** Other non-metallic mineral products
- **10** Basic metals; fabricated metal products, except machinery and equipment
- **18** Grouped goods: a mixture of types of goods which are transported together

**Fig. 1** Transport volumes and tkm of all commodity groups (NST 2007) in percentage share, n= 603,215.
3.2 Results of the analysis: Transport distance

**NST 2007 classification:**

01  Products of agriculture, hunting, and forestry; fish and other fishing products

04  Food products, beverages and tobacco

06  Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products; printed matter and recorded media

08  Chemicals, chemical products, and man-made fibers; rubber and plastic products; nuclear fuel

09  Other non-metallic mineral products

10  Basic metals; fabricated metal products, except machinery and equipment

18  Grouped goods: a mixture of types of goods which are transported together

**Fig. 2** Boxplot of distances per transported goods in km in the selected commodity groups, n= 422,135.
3.3 Results of the analysis: The loading unit*

**NST 2007 classification:**

- 01 Products of agriculture, hunting, and forestry; fish and other fishing products
- 04 Food products, beverages and tobacco
- 06 Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products; printed matter and recorded media
- 08 Chemicals, chemical products, and man-made fibers; rubber and plastic products; nuclear fuel
- 09 Other non-metallic mineral products
- 10 Basic metals; fabricated metal products, except machinery and equipment
- 18 Grouped goods: a mixture of types of goods which are transported together

*Note that the variable is not covered by Denmark, Italy, United Kingdom.

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**Fig. 3** Percentage share (tkm) of type of cargo for tours between 150 km and 299 km, n= 201,443, and tours longer than 299 km, n=213,203.
3.4 Results of the analysis: The degree of loading*

**Fig. 4** Percentage share (tkm) of degree of loading for tours between 150 km and 299 km, n= 111,806, and tours longer than 299 km, n=130,689.

*Note that the variable is not covered by Czech Republic, Ireland, Italy, Luxembourg, Hungary, Switzerland.
3.5 Results of the analysis: Type of tour*

**NST 2007 classification:**

- **01** Products of agriculture, hunting, and forestry; fish and other fishing products
- **04** Food products, beverages and tobacco
- **06** Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products; printed matter and recorded media
- **08** Chemicals, chemical products, and man-made fibers; rubber and plastic products; nuclear fuel
- **09** Other non-metallic mineral products
- **10** Basic metals; fabricated metal products, except machinery and equipment
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**Fig. 5** Percentage share (tkm) of type of journey for journeys between 150 km and 299 km, n=206,593, and journeys longer than 299 km, n=215,542.

*Note that Germany only records the type of good with the uppermost weight.
4. Summary and conclusions

**Quantifying the European road freight market for LHVs on the long haul...**

- Vehicles with a load capacity of at least **23 tons**
- Tours with distances of at least **150 km**

Seven commodity groups have a percentage share of more than **5% (tkm)**.

**Loading units:**
Transports on pallets increase from ~**44% (tkm)** for 150km-300km to up to ~**58% (tkm)** for > 300km.

More pallet space? Smart loading units?
4. Summary and conclusions

Quantifying the European road freight market for LHVs on the long haul...

Degree of loading: 
~50% (tkm) of the analysed tours are fully loaded (in terms of max. volume or space).

Type of tour: 
One single transport operation tours have a percentage share of ~77% (tkm).

Intelligent load consolidation and smart loading units?
→ Economies of scale.

Smart loading units for fast un-/loading?
Combination of compatible loading units with different sizes?

Estimate choice models for the loading unit; the degree of loading; the type of cargo...
Thank you for your attention!

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Literature

- Eurostat (2014c). Methodologies used in surveys of road freight transport in Member States, EFTA and Candidate Countries.