

## THE MARKET OF THE FREIGHT TRANSPORTATION IN CONNECTION WITH THE EXISTING INDUSTRIAL PRODUCTION IN THE CZECH REPUBLIC

Dominika STOCH<sup>a</sup>, Milan STOCH<sup>a</sup>, Kamila JANOVSKÁ<sup>b</sup>, Šárka VILAMOVIČ<sup>a</sup>

<sup>a</sup> VSB - Technical University of Ostrava, Ostrava, Czech Republic, EU, [dominika.stoch@email.cz](mailto:dominika.stoch@email.cz),  
[milan.stoch@vsb.cz](mailto:milan.stoch@vsb.cz), [sarka.vilamova@vsb.cz](mailto:sarka.vilamova@vsb.cz)

<sup>b</sup> Business School Ostrava plc, Ostrava, Czech Republic, EU, [kamila.janovska@vsp.cz](mailto:kamila.janovska@vsp.cz)

### Abstract

The article outlines the current situation in the market development of the freight transportation, especially the road and railway transportation with respect to the current development and its interconnection to the subsequent logistics in relation to the current recession in the Czech Republic. Identifying new trends in the development of freight railway transportation and based on the present state of economics both in the Czech Republic and the article presents the full-scale set of reasons for decrease in the volume of transported goods in the context of its interconnection to the logistic chain.

**Keywords:** economic recession, combined transport, logistics, transport services, competitive ability

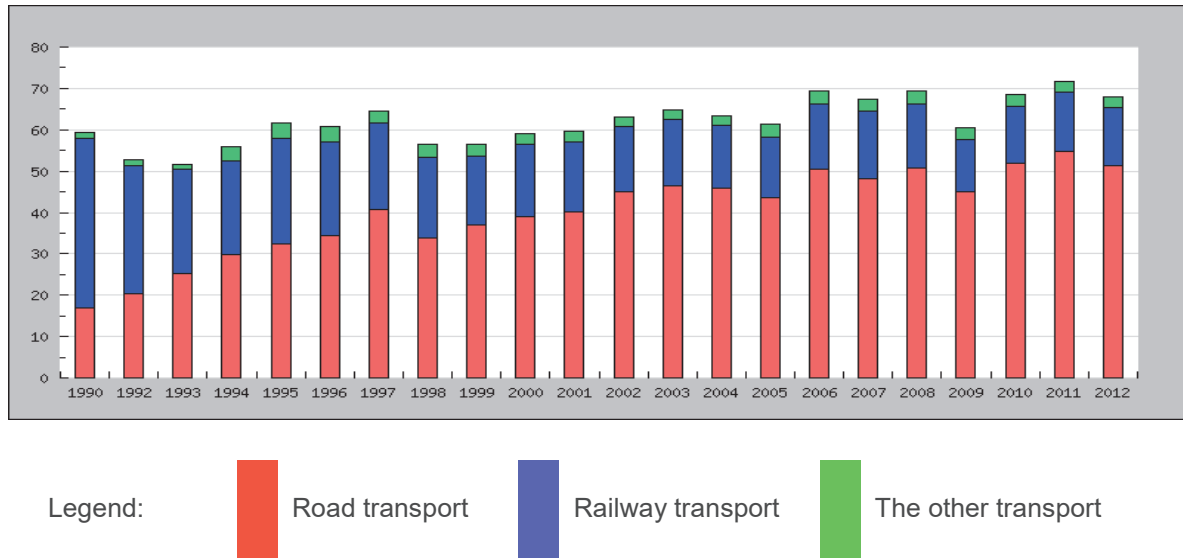
### 1. INTRODUCTION

In general it is known that after the revolution there was a drop in the railway transport services due to the changes in the structure of economics and decline in the heavy industry, which resulted in the increase in the road transport. Even in the following period this trend continued (in case of the railway transport it has been a lasting decline, the road transport is marked with a fluctuating trend and a considerable decrease has been quoted in all types of transportation, especially in connection with the economic recession in 2009). Also the other transforming economies tackled similar problems, mainly in the years 1995 - 2004. Various analyses and surveys show that the road transport is predetermined for transportation up to the distance of 150 km. Transport significantly affects the development of economy, its competitiveness in an environment of worldwide globalization, the level of quality of transport represents a significant decision-making factor for investors, and the quality of transport is one of the indicators of quality of life of people. Globalization does not leave railways unaffected. With regard to the growth of industrial production in the Czech Republic, in particular the dominance of the automotive industry, the demands on logistics and its branch - freight transport have been increasing.

### 2. THE DEVELOPMENT OF THE FREIGHT TRANSPORT MARKET IN THE CZECH REPUBLIC

Since 2000 the transportation services of the freight transport in the Czech Republic have been fluctuating in accordance with the development of economics and industrial production (see **Fig. 1**). The transportation services were 12% higher in 2012 compared to 2000. Between 2011 and 2012 they decreased by 5.5% to 68.1 billion tkm. The freight road transport with a 75.2% proportion, whose transportation services decreased by 6.6% to 51.2 billion tkm in 2012, significantly predominates in the structure of transportation services of the freight transport. The freight transport structure is not environment-friendly. Pollution arising from the freight road transport has been considerably reduced due to the modifications and changes in the vehicle fleet. The overall transportation services in the passenger transport in the Czech Republic have been stagnating. [14] The proportion of public transport in transportation services for the passenger transport is about 40% and it is above average in the European context. In 2012 the railway transportation services increased by 8.3%. The

use of railway services in integrated city transport systems has been going up. [1] **Fig. 1** shows a falling tendency in the transportation services in general.

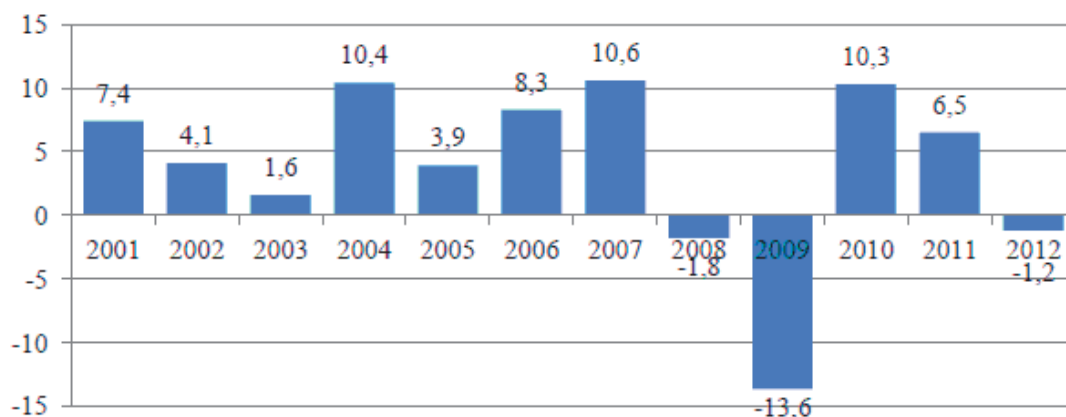


**Fig. 1** Transportation services of the freight transport according to the individual types of freight transport in the Czech Republic (billion tkm) [2]

### 2.1 The impacts of economic recession on railway freight transportation

According to the data published by the Czech Statistical Office industrial production in the Czech Republic in December 2013 reached interannual growth of 9% and construction production increased by 1.4%. Industry is a significant part of Czech economy (see **Fig. 2**). Over 40% economically active inhabitants are employed in industry. The main fields of industry consist of chemical, engineering, food and metallurgical industries. Other important fields are power, construction and consumer goods industries. Industry represents 35% of Czech economy. [9] We have not yet emerged from the European encumbrance crisis, American pick-up in the market may get jammed, not speaking of the situation in China. As the US economy in 2010 and 2011 profited from the Chinese growth, now this may turn. This will most probably not suffice to increase the growth of China by more than 7% which is not sufficient for significant improvement of the state of mining and power industries. These fields have been suffering great difficulties and the prospects of financial markets are still not favorable. The price of commodities, such as coal or iron ore keep being pressed down by the excess supply and the prospects are not improving. The good news for industry is the fact that the price of energy will stagnate (not only due to low price of coal, but also due to the breakdown in trade with emission permits in the EU.) [7]

The problems of railway in the area of freight transport are caused by the inability to increase its market share (see **Fig. 2**). These problems are related to reliability, current capacities, information management, average train speed and flexibility in particular. Although the competitiveness is increasing, but full interoperability has not been achieved by any means yet. Despite the fact that the revenues of freight transportation of České dráhy have been growing, the profit has been decreasing. As early as in 2008, the annual transport volume of ČD Cargo was reduced by 5.5 million tons of transported goods, i.e. to 86.2 million tons, compared to 2007, however the revenues fell just by one percent to 17.6 billion CZK (by a mere 1% less than in 2007). This reduced transport volume has already “foreshadowed” the economic crisis. The **Table 1** clearly shows that the development of railway freight transport in the individual years began to decline gradually.



**Fig. 2** Industrial production index (year-on-year changes in %) [4]

**Table 1** Railway freight transport: total transport of goods - development according to individual years [3]

Year/Quarter	Total transport of goods (thousands of tons)					
	Total	Inland	International			
			total	import	export	transit
2004	<b>88 843</b>	39 765	49 078	21 321	20 456	7 301
2005	<b>85 612</b>	39 506	46 106	18 907	20 523	6 676
2006	<b>97 491</b>	45 861	51 630	22 057	21 924	7 649
2007	<b>99 777</b>	46 959	52 818	22 759	22 139	7 919
2008	<b>95 074</b>	44 148	50 926	21 876	21 228	7 822
2009	<b>76 715</b>	36 859	39 857	15 808	18 049	6 000
2010	<b>82 900</b>	37 078	45 822	18 790	19 746	7 287
2011	<b>87 096</b>	40 203	46 893	19 391	19 401	8 101
2012	<b>82 968</b>	37 054	45 914	18 698	19 099	8 117

The gradual decline applies to both inland and international transport, with the exception of 2006-2008, when the economy recovered and the onset of economic recession. The spiral effect of recession on the current market with the individual commodities very significantly affects carriers as well. The mutual links are therefore apparent here as well. The current economic effect has been particularly visible in building and automotive industries. In terms of the individual groups of transport, the main affected commodities in ČD Cargo are iron and engineering products, which reflects the lower demand in the market (in 2012, the share of transport is 20.3%), bituminous coal and coke (the share of transport is 11%), wood (5.6%) and brown coal (18.7%). This fact is also reflected in the gradual reduction of combined transport, including the transport of containers and trailers, which currently makes up 12%. [5]

**Table 2** shows structure of freight transportation according to the individual types of freight transport in CR in the context EU in 2010.

**Table 2** Structure of freight transportation according to the individual types of freight transport in CR and EU 27 in 2010 (in %) [8]

Type of Transport	Transport capacity [billion tkm]	Capacity ratio [%]
<b>ČR</b>		
Road	51.8	75.62
Railway	13.8	20.15
Waterborne continental	0.7	1.02
Pipeline	2.2	3.21
<b>EU 27</b>		
Road	1 756	45.87
Railway	390	10.19
Waterborne - River	147	3.84
Waterborne - Sea (in EU27)	1 415	36.96
Pipeline	120	3.13

### 3. GLOBAL TRANSPORTATION PROPORTIONS

Carriage by sea globally predominates in the structure of transportation services of the freight transport (approximately three fifths of transport capacity). The proportion of road and railway freight transport is roughly even. Distinct predominance of road freight transportation as monitored in the EU is relatively unique. In the USA, where almost every citizen owns a car, the freight transportation is mainly conducted via railway. The railway transportation covers 43% of total transport capacity there; road transport only 31% and the ratios of other types of freight transport are markedly lower. The ratio of railway service is the highest in transportation also in Russia, China, India and Kazakhstan. These four countries are responsible for app. 98% tkm out of 35 countries of Asia, where railway predominates while in the countries of south-east Asia it is the carriage by sea which predominates.

Air freight transport is mainly used for transportation of precious goods with high value and small volume. While approximately 1% of cargo is globally shipped by air, the cost represents about 40% of total cost of transported cargo in the world. The goods most frequently transported by air are electronics and designer clothes. Since the 1950s the container transportation has partaken in the development of global freight transport. Standardized ISO containers have meant a revolution in international and domestic transportation and have brought considerable savings formerly invested into reloading the cargo. Containers are mainly transported by railway on land and reloaded on ships in ports. [14]

#### 3.1 The position of industry and trade on the global scale

In 2010 there was a high growth (by 10.35) in the industrial production due to a strong revival in Germany and recovery in major economics in the European Union. However, in 2011, owing to the reduced growth of global demands in individual seasons, there was a gradual slow-down. Despite that the industrial production reached a high increase (by 6.5%). In the first quarter of the year 2012 the production maintained a slight growth but gradually went down in the remaining periods of the year (in the 2nd quarter by 1.5%, in the 3rd quarter it was decreased by 2% and in the 4th quarter it dropped down to 3.9%). In 2012 the industrial production was decreased by 1.2%. The unfavorable process was caused by deepening problems of the industry arising from slack foreign demands and inquiries and a slump in domestic demands and inquiries. The problems of the European automobile industry inflicted by reduced demands had an impact on crucial domestic automobile industry (in 2012 its share reached 24.9%) slowing down its production activity. (4) According to the Eurostat data from May 2013 the civil engineering production decreased by 31.9% in comparison with 2008. The index

diagram of the industrial production (quoted in percentage in year-on-year changes) according to the ČSU statistics proves the above mentioned.

#### **4. DEVELOPMENT TRENDS IN RAILWAY FREIGHT**

Construction of high-speed railways in the CR poses a possibility for considerable increase of competitiveness of railways transport over road transport. It is a currently unavailable product in CR considering high-speed, mainly international passenger railway transportation which will be undoubtedly required due to increasing deficiency of road network capacity. Absolute dominance of road freight transportation does not seem optimal with respect to ecology as well as its capacity. Railway freight transport would certainly prove higher potential provided that competitiveness will improve, which is conditioned by investments into logistic terminals connected to railway infrastructure. The state has an essential role in the process as trade regulator. Current trade ratio of railway freight transportation ČD Cargo, a.s. in the Czech Republic is 79%, which indicates the state acts in this matter only with great reserve. The attention should be aimed mainly at construction of new re-loading docks and logistic terminals for combined and intermodal transportation. Fiscal actions and measures of the government, which decrease domestic demands, strengthening the Czech currency, which has a negative impact on the export and growth of input prices, can negatively affect the logistic market. The key segments are: the automobile industry and the area of consumer goods production. The situation in the automobile industry, metallurgy and timber industry is very important for the freight railway transport. The most opportunities for the foreign trade and thus for the carriers/transporters are offered on the markets in Russia, India and China (Germany is the main market for the Czech Republic) [12]. The goods transport on the railroads between Asia and Europe has great prospects. Therefore, it is necessary to improve especially the infrastructure and to build a reliable, fast and save Eurasian corridor. This is one of the most important conclusions of the International Rail Freight Conference (IRFC), which was organized by OLTIS Group and JERID and held in Prague in March. At present the Trans-Siberian main railway is the busiest railway line in the world. In future this railway line will be used by more than a hundred of pairs of passenger and freight trains per day. The investment in its development up to 2020 will make over six billion US dollars as stated by V. Jakunin, the President of the Russian Railway, at the IRF Conference organized in Prague by OLTIS Group and JERID.

#### **CONCLUSION**

The logistics is on the global scale estimated at approximately 5.4 billion EUR, or 13.8% of global GNP. The logistics costs present the average of 10-15% of final costs of the product. Even though the importance of logistics increases, there is a lack of reliable statistical information on the matter. However, the companies in the EU are becoming more and more aware of existence of an alternative to road transportation of goods. [6] Switzerland stands as a great example as they successfully manage to combine the road and railway transportation. The road, railway and waterborne infrastructure in the Czech Republic is not in the adequate condition regarding technical and safety parameters and the quality of transport route. In accordance with European principles the transport infrastructure in the Czech Republic should also comprise terminals for combined and intermodal 1) transport, traffic control systems, positioning and navigational systems and geographical information systems. Construction of new terminals and reloading docks will also be essential for freight transportation in the Czech Republic, as well as focusing on combined transport. The current logistics will not do without significant improvement of infrastructure, specifically new high-speed railways, and completion of liberalization of railway.

Quantification of risks in railway freight transportation is relatively difficult. The sources of risks are mainly represented by potential possibility that the route will be overloaded and also trade failure by which the anticipation of individual shippers may not be accomplished. It is necessary to identify what represents realization of risk phenomenon for each provider of railway freight transport. It is mainly failure of accomplishing

the economical expectations which result from their activity. The cause might be either a lack of capacity in the transport route, or more probably the development of economics, particularly the key fields to railway freight transport. These fields are related to the raw materials, or commodities, which form the predominant source for railway transportation. The decrease of construction, which is difficult to predict, means decrease of loose material transport, as well as the decrease of automotive production means decrease of metallurgical materials (metallurgy reported a growth in 2009 but currently it is in recession), that is also automobiles. Moreover the development of energetics and its greening does not play into the hands of growing volume of transportation of coal. Generally, the greatest source of risks in the field of transportation is current dynamic changes which are caused by global trends related to topical problems of the global economics. If it is possible to identify, that is also quantify, these sources, the impacts of the risk, which will show in not achieving the economic targets of individual providers of railway freight transportation, will be evident and quantifiable as well.

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