

# Do European Reforms Increase Modal Shares of Railways?

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**Abstract:** *The transport policy of the European Union aims to increase modal share of railways. Its principal reform measures are vertical separation and competition entry. However, there are other possible reform strategies and it is not clear whether European reforms actually increase railway's modal shares. Based on the analysis performed on 27 European countries in the period 1995–2013, there is no proof that vertical separation and competition entry increase modal shares of European railways. The horizontal separation of the freight and passenger division of the incumbent and subsequent privatisation of the freight division seems to be a more promising strategy. There are also important differences in long-term developments between countries of Western and Eastern Europe, which should be controlled for.*

**Keywords:** railways; modal share; vertical separation; horizontal separation; competition.

## 1. Introduction

The European Union (EU) has decided to adopt a resource-efficient transport system that will enable a decrease in emissions, and therefore the European Commission (EC) has set ambitious goals for modal shares of railways. Specifically, 30% of road freight travelling over 300 km should shift to rail and water by 2030, and more than 50% by 2050. The majority of medium-distance passenger transport should go by rail by 2050 (European Commission, 2011). These goals are underpinned by concrete initiatives. Ensuring effective and non-discriminatory access to infrastructure through vertical separation of the industry and opening market to competition are the key initiatives (reforms) in the railway sector (European Commission, 2011). The idea is that rigid structure and the absence of competition were the reasons behind the decline that railways experienced and that vertical separation and introduction of competition, together with infrastructure investment and stable government financing, can bring about revitalisation of railways and increase of their market shares (European Commission, 2001).

However, there is an argument that there are many more reasons for the long-term disappointing performance of railways (United Nations 2003). The long-term structural decline of railways has been caused by many interconnected factors, and they may be classified as exogenous (transformation of other industries, policies, and investment that favoured road) and endogenous (limited attention to customer care, weak reliability, limited flexibility, fragmented cross-border services, lack of service integration, lack of competition) (DiPietrantonio–Pelkmans 2004). When assessing chances of success for European railway reform, it is critical to assess whether reforms are targeting the most important problems. It is not clear whether vertical separation and competition entry can be powerful enough to increase market shares of railways. Some exogenous factors can be hardly reversed (changing structure of economy to low weight, just in time production) and some endogenous problems can be better targeted by privatisation than by competition.

Some scholars also questioned the net benefits of vertical separation and competition introduction for the railway industry, arguing that they are moderate due to high intermodal competition (Seabright et al, 2003), high share of fixed costs (Pittman 2005) and inducement of coordination costs (van de Velde, 2012). This argument is supported by the fact that when reforming their railway sectors, other countries—with the exception of Russia and two Australian states—have chosen different paths than vertical separation and intramodal competition. These approaches included horizontal separation of freight and passenger operations of the incumbent (United States, Canada), privatisation (Japan, New Zealand), or long-term concessions (Latin America) (Gómez-Ibáñez - de Rus, 2006, Drew 2011).

The assessment of European reforms is further complicated by the fact that they were applied on very heterogeneous groups of countries. Differences between Western and Eastern (postcommunitic) European countries are particularly important. European railway reforms were designed basically for Western European countries in the 1990s. After having joined the EU, many postcommunitic countries started to apply these reforms on their railway systems, too. However, both their economies and their railway systems were in conditions that differed significantly from those of their Western European counterparts. Their economies were poorer, their railway systems unstable and underfinanced (Tanczos - Bessenyeie 2009), and their regulatory capacities were on a much lower level than in their Western European counterparts. Eastern European railway systems have been suffering from many structural problems (Carbajo-Sakatsume 2004; Amos 2005) and it is questionable whether vertical separation and the introduction of competition are actually targeting the most relevant problems in these countries (Friebel et al 2007; Pittman et al. 2007).

In some countries, European railway reforms were implemented as early as the 1990s. Other countries were much slower in implementation. This different pace of reforms among European countries gives enough scope for analysing the impact that European reforms had on modal share of railways. The aim of the article is to identify whether European reforms increased modal share of railways in 27 European countries in the time period of 1995–2013. The structure of the paper is as follows: Section 2 reviews relevant literature, section 3 provides methodology and data, section 4 states results, section 5 provides their discussion and, finally, section 6 concludes.

## **2. Previous studies**

There is substantial literature concerning the effects of European reforms on the efficiency of railways. Their main conclusions are that entry of competition results in an increase of efficiency (Asmild et al. 2009; Friebel et al. 2010; Cantos Sánchez et al. 2010; Cantos Sánchez et al. 2012) and horizontal separation increases efficiency (Cantos Sánchez 2001; Cantos Sánchez et al. 2010; Mizutani–Uranishi 2013; van de Velde et al. 2012). There is less consensus about the effect of vertical separation on efficiency, as some studies identified positive effects (Driessen et al. 2006; Friebel et al. 2010; Cantos Sánchez et al. 2010), one study found a negative effect (Growitsch–Wetzel 2009), but the majority of studies identified insignificant or unclear effects (Cantos Sánchez 2001; Wetzel 2008; Asmild et al. 2009; Cantos Sánchez et al. 2012; Mizutani–Uranishi 2013; van de Velde et al. 2012; Mizutani et al. 2015). Besides differences in estimation methods and time periods, there were other differences in the samples of countries. Some studies included postcommunist countries (Wetzel 2008; Asmild et al. 2009; Cantos Sánchez et al. 2012; Mizutani - Uranishi 2013; van de Velde et al.

2012; Mizutani et al. 2015) but some studies excluded them (Cantos Sánchez 2001; Driessen et al. 2006; Friebel et al. 2010; Cantos Sánchez et al. 2010)

There is substantially less evidence about the impact of reforms on railways' modal share. Drew-Nash (2011) analysed descriptive statistics of 25 European countries in the period 1998–2008 and identified no significant correlation between vertical separation and modal shares of rail transport. They acknowledged that there are other factors influencing modal shares of railways, especially effectiveness of regulation, the financial situation of the incumbent operator, under-compensation for mandated public service provisions, and government support for investment in infrastructure. They point out that these factors are particularly significant in some countries of Eastern Europe where vertical separation and market opening on rapidly deteriorating infrastructure reduce competitiveness of all operators, and suggest that a solution that suits Western Europe with adequate financing for infrastructure may not be adequate for Eastern Europe. Another empirical study by Laabsch-Sanner (2012) analysed whether vertical separation influenced modal share of railways. They carried out a panel regression on a sample of nine Western European countries in the period 1994–2009 and identified a negative effect of vertical separation on passenger modal shares and no significant effect on freight modal share. From control variables, higher public subsidies have surprisingly no effect on passenger modal share; however, there were significant positive effects of GDP and liberalisation index. Authors argue that different effects of vertical separation in the passenger and freight sectors may be caused by the different scope of competition in both sectors.

Van de Velde et al. (2012) analysed a sample of 26 European countries over the period 1994–2010 and concluded that in the passenger sector both vertical separation and competition entry had a negative effect on railways' modal share. However, the cross term of vertical separation and competition entry was positive and significant here. The authors also used more detailed indicators of vertical structure and competition, and claimed that there was no statistically significant difference between vertical separation model and holding company when the passenger market is open to competition. In the freight sector, no significant effects of structural or competition indicators were found so the author concluded that they had found no evidence that vertical separation was superior to vertical integration in its impact on rail's modal shares. The most recent study by Kougiomtazidis (2014) provides an analysis on 28 European countries in the period 2003–2011 and claims negative effects of vertical separation on passenger modal share, arguing that this result can be explained by the fact that the passenger market is quality driven. Competition in the vertically separated market can decrease prices with negative impact on quality of services, inducing passengers to switch to other transport modes. There was no significant effect of vertical separation in the freight sector which is explained by higher sensitivity to price and lower to quality.

Based on these studies, there seems to be consensus that vertical separation decreases market shares in passenger sector and has no significant effect in freight sector. Less clear are the effects of competition entry and horizontal separation which were analysed only in van de Velde et al (2012); therefore, the impact of reforms on modal share of railways is still not a deeply analysed theme. Moreover, some important research questions were not targeted in the existing empirical studies. Only Drew-Nash (2011) explicitly analysed differences between development in Western and Eastern Europe; however, they analysed only descriptive statistics and therefore they could not utilise control variables. Different impacts of reforms in Western and Eastern European countries are

important when interpreting results of empirical studies conducted on a sample of only Western European countries, such as Laabsch-Sanner (2012).

### 3. Methodology and data

There are two principal railway reforms in the EU: vertical separation and competition entry. The main task was to measure the impact of these reforms on the modal shares of railways. Therefore, reform indicators had to be constructed. They were captured by binary variables that received value 1 when country made this reform, and 0 if otherwise. The reform variables were constructed in the following way:

- VERTICAL SEPARATION variable measures whether or not a country has carried out a complete institutional separation of infrastructure manager and incumbent operator.
- COMPETITION ENTRY variable measures whether there was significant competition entry into railway market. The benchmark for competitive entry was chosen as 1% and more of market share of nonincumbent operators. There were two variables: one for freight, and one for passengers.

The source of information for reform variables were primarily IBM (2011, 2007, 2004, 2002), Steer Davies Gleave (2012), RMSS (2014, 2012, 2010), and national resources. When the reform took part in the second part of the year, it was recorded from the next year. Vertical separation was understood as complete institutional separation of infrastructure operator and incumbent operator into two separate entities. Holding structures where infrastructure manager and incumbent operators remained under one ownership umbrella were counted as vertically integrated. Competition entry was recorded when it was substantial (reaching at least 1% of market share) in order to capture significant entries to the market and to omit the negligible entries. As competition entries were counted only when the new entrant entered the existing market and challenged the incumbent on the same network. There are some cases where two different networks with two different vertically integrated operators exist in one country (Gysev and MAV in Hungary; SBB and BLS in Switzerland; EVR and EER in Estonia; OBB and small integrated operators in Austria). The historical existence of two separate networks with different incumbents inside one country cannot be regarded as competition entry, only when one of the incumbents' networks was entered by a new entrant was competition entry acknowledged.

Besides vertical separation and competition entry, some countries have also added horizontal separation of the freight and passenger operations of the incumbent. This process was very often (in 7 out of 10 cases) followed by the privatisation of the freight operator. Therefore, two other reform variables were added:

- HORIZONTAL SEPARATION measured whether a country made a complete institutional separation of the freight and passenger operations of the national incumbent operator.
- FREIGHT PRIVATISATION measured whether a country privatised horizontally separated freight division.

Horizontal separation is counted when the passenger and freight divisions of the incumbent are separated into two institutionally separate entities. Almost all horizontal separations are preparations for freight privatisation; in Slovakia and Romania these plans have not materialised yet. Latvia is an interesting case where passenger operations but not freight were carved out of a

vertically integrated incumbent. The so far realised freight privatisations have been exclusively into hands of other European incumbent railway operators.

Table 1 Railway reforms in European countries

	Vertical separation	Competition entry freight	Competition entry passenger	Horizontal separation	Freight privatization
<b>Austria</b>	-	1999 -	2012 -	-	-
<b>Belgium</b>	-	2007 -	-	-	-
<b>Bulgaria</b>	2002 -	2006 -	-	-	-
<b>Czech Rep.</b>	2003 -	1995 -	2012 -	-	-
<b>Denmark</b>	1998 -	1999 -	2003 -	2001 -	2001 -
<b>Estonia</b>	-	2000 -	2006 -	1997 -	2001 -
<b>Finland</b>	1995 -	-	-	-	-
<b>France</b>	1997 -	2007 -	-	-	-
<b>Germany</b>	-	1995 -	1996 -	-	-
<b>Great Britain</b>	1995 -	1995 -	1996 -	1996 -	1996 -
<b>Greece</b>	2010 -	-	-	-	-
<b>Hungary</b>	-	2004 -	-	2009 -	2009 -
<b>Ireland</b>	-	-	-	-	-
<b>Italy</b>	-	2002 -	2004 -	-	-
<b>Latvia</b>	-	2003 -	-	2009 -	-
<b>Lithuania</b>	-	-	-	-	-
<b>Luxembourg</b>	-	-	-	-	-
<b>Netherlands</b>	2002 -	1998 -	2000 -	2001 -	2001 -
<b>Norway</b>	1997 -	2005 -	-	2002 -	2002 -
<b>Poland</b>	-	2003 -	2005 -	-	-
<b>Portugal</b>	1997 -	2008 -	1999 -	-	-
<b>Romania</b>	1998 -	2002 -	2008 -	1998 -	-
<b>Slovakia</b>	2002 -	2004 -	2012 -	2005 -	-
<b>Slovenia</b>	-	2011 -	-	-	-
<b>Spain</b>	2005 -	2007 -	-	-	-
<b>Sweden</b>	1995 -	1995 -	1995 -	2001 -	2001 -
<b>Switzerland</b>	-	2000 -	-	-	-

*Sources:* IBM (2011, 2007, 2004, 2002), Steer Davies Gleave 2012, RMSS (2014, 2012, 2010) and national resources

The sample consisted of 27 European countries. There was no inclusion of non-European countries because they operate in a different environment; and, when compared to European railways, they have very different operational indicators. The analysed period was 1995–2013, which should capture a time period as long as possible. The year 1995 was chosen as a start of analysis because data for many countries are available starting that year, and, also, it is the date when Eastern European countries recovered from the most drastic shocks to their economies and their railway systems. There is an important difference between railway systems of countries in Western and Eastern Europe. Therefore, there have been explicit divisions between these two groups of countries. They were defined as:

- WEST– Austria, Belgium, Denmark, Germany, Ireland, Greece, Spain, France, Italy, Finland, Norway, Sweden, UK, Luxembourg, Netherlands, Portugal, Switzerland
- EAST – Bulgaria, Czech Rep., Estonia, Lithuania, Latvia, Poland, Romania, Slovenia, Slovakia, Hungary.

The reason for this approach was that there are clearly different trends in the development of modal shares of countries of Western and Eastern Europe—with the latter continuously falling. The research strategy was to allow two trend variables, one for the Western and other for Eastern European countries, to accommodate differing trends in the development of their market shares.

There were three other control variables:

- GDP per capita (GDP\_pc), which was meant to capture the effect of different economic levels among countries. It is expected that a higher economic level should induce lower modal shares of railways. To cope with widely different levels in the sample, it was used in logarithmic form.
- INFRASTRUCTURE measured as length of railway lines to the sum of length of railways lines and highways in the country. This variable should control for different conditions for railway transport in countries, especially in the freight transport.
- EMPLOYMENT RATE measured as ratio of employed people in total population. The reason is that more employed people should increase demand for passenger rail transport.

Online database of Eurostat was the source of the data of all these control variables.

Table 2 Descriptive statistics

<b>Variable</b>	<b>Unit</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>St.dev.</b>
MODAL SHARE FREIGHT	%	24.17	0.6	84.9	18.40
MODAL SHARE PASSENGER	%	6.87	0.6	26.5	3.73
VERTICAL SEPARATION	Binary	0.39	0	1	0.49
COMPETITION ENTRY FREIGHT	Binary	0.51	0	1	0.50
COMPETITION ENTRY PASSENGER	Binary	0.26	0	1	0.44
HORIZONTAL SEPARATION	Binary	0.24	0	1	0.42
FREIGHT PRIVATIZATION	Binary	0.17	0	1	0.38
WEST	Binary	0.63	0	1	0.48
EAST	Binary	0.37	0	1	0.48
TREND		10	1	19	5.48
GDP p.c.	thous. EUR	22.03	1.90	70.54	14.92
ln GDP p.c.		2.79	0.64	4.26	0.86
EMPLOYMENT RATE	%	54.34	38.40	72.00	6,87
INFRASTRUCTURE	%	79.96	45.96	100.0	13.81

#### 4. Results

The estimation method was fixed effect in panel data regression and it was chosen because it accommodates different starting conditions for development of modal shares in different countries. The analysis was divided into separate estimations of modal shares in the freight and passenger sectors. Promotion of competition is the main advantage of vertically separated structures, and therefore there were two specifications in each sector with and without cross term of vertical separation and competition entry (VS x CE). This should control whether there is a significant difference between competition effects in vertical separated and vertical integrated structures. As for horizontal separation, the total effect of horizontal separation (HS) on the modal shares was estimated. Following, it was differentiated between cases of horizontal separation with and without subsequent privatisation of the freight operator in order to separate the effects of horizontal separation and privatisation.

Table 3 Fixed Effects Estimation Results on Railway's Modal Shares.

	MODAL SHARE FREIGHT		MODAL SHARE PASSENGER	
	(1)	(2)	(3)	(4)
Const	58.90***	59.68***	7.78*	8.34*
VERTICAL SEPARATION	-3.10*	-1.18	-1.59**	-1.36**
COMPETITION ENTRY	-1.70*	-0.39	-0.53	-0.37
<i>Cross term VS x CE</i>		-3.46**		-0.67
HORIZONTAL SEPARATION	2.62*		0.30	
<i>HS with privatization</i>		3.41**		0.93
<i>HS without privatization</i>		1.88		-0.72
WEST*TREND	0.31***	0.30***	0.18***	0.17***
EAST*TREND	-0.86***	-0.86***	0.04	0.04
ln GDP_pc	-13.67***	-14.22***	-6.91***	-6.96***
EMPLOYMENT RATE			0.24**	0.23**
INFRASTRUCTURE	0.08	0.08	0.06*	0.06*
R <sup>2</sup> (within)	0.75	0.76	0.55	0.57
# observation	513	513	513	513
# countries	27	27	27	27

\* significant at 10 % level \*\* significant at 5 % level \*\*\* significant at 1 % level (based on robust standard errors)

The principal result is that vertical separation and competition entry do not increase modal shares of railways. The impact of vertical separation was negative in the passenger sector and insignificant in freight. The impact of competition entry was insignificant in passenger and weakly negative in freight. Even controlling for cross effects did not change these results. Why do vertical separation and more intensive competition not lead to higher modal shares? The reasons may be different in each sector. The freight sector consists of the full train market and wagonload market. Higher efficiency induced by competition entry can lower prices and stimulate output in full train traffic; however, at the same time, it can stimulate further decline of wagonload traffic with total negative impact on modal share in freight. The competition entry in the passenger sector was mainly in the form of competition for the market. If public authorities are not willing to use competitive tendering to increase the total scope and frequency of services, it will not lead to an increase of modal shares.

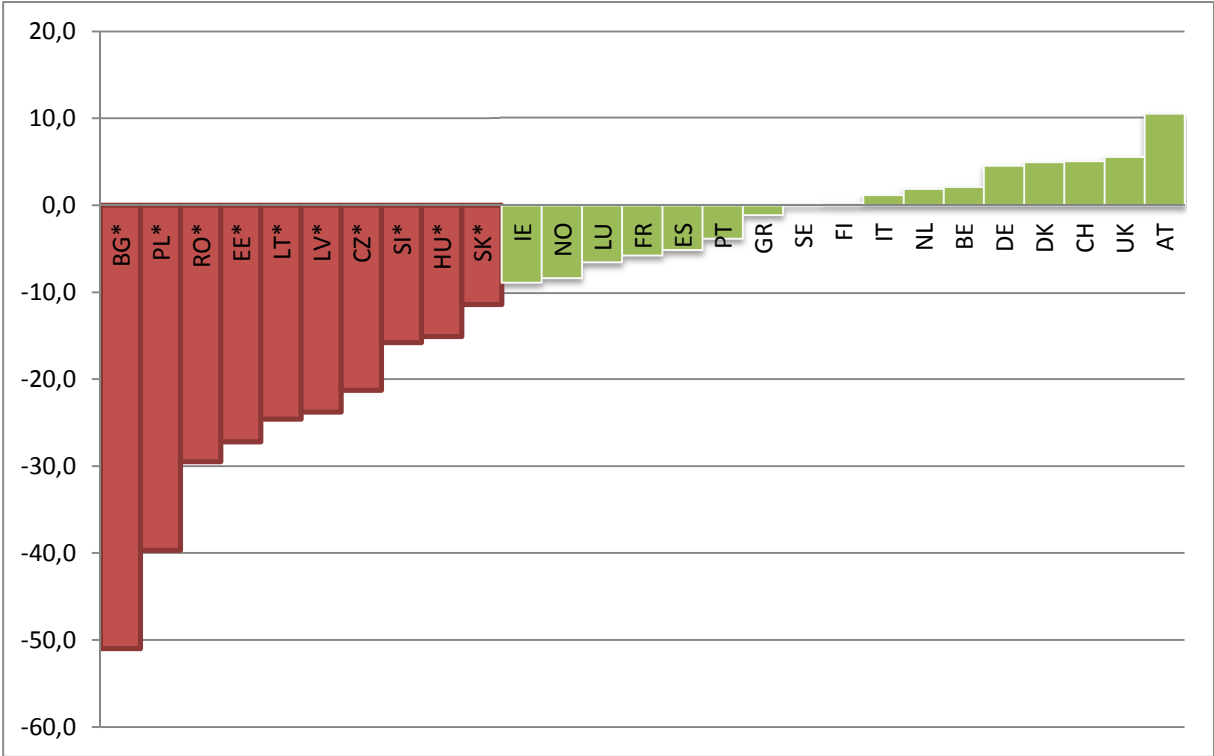
On the other hand, horizontal separation is a more promising strategy in increasing modal share of railways, especially in the freight sector. The separation of freight and passenger operation of the incumbent eliminates internal cross-subsidies with positive impact on railway's efficiency and freight's modal shares. Controlling for cases with/without subsequent privatisations, the freight privatisation is the key factor in stimulating rail market shares. The new owners of sold freight divisions were very often rail incumbents from another European country (DB in the case of the Danish and Dutch cargo; OBB in the case of Hungarian cargo; and Swedish Green cargo in the case of the Norwegian freight). But it seems that privatisation into the hands of publicly owned foreign operator have beneficial effects, probably because they are under less pressure from domestic authorities to pursue other goals than economic efficiency.

From control variables, the effect of  $\ln$  GDP p.c. is negative and strongly significant. Higher economic levels transform into lower usage of rail because of higher car ownership and more service oriented economy. Also, countries with high rates of economic growth have a higher frequency of structural changes. These changes are not prospective for railways that are bound by their expensive and inflexible infrastructure which can only hardly accommodate new spatial developments of housing, mobility, production, and trade. The infrastructure control variable was significant only in the passenger sector, probably because of its crude construction, which was length of rail lines to the sum of length of rail lines and road highways. An indicator measuring quality of infrastructure differentiating between countries with competitive and neglected rail infrastructure would probably be more appropriate. Data were lacking for such an indicator, and in future research it could be possibly replaced by an indicator measuring level of infrastructure investment and/or subsidies. The control variable employment rate was positive and significant in the passenger sector. It can be inferred that higher employment in the economy stimulates more rail commuting.

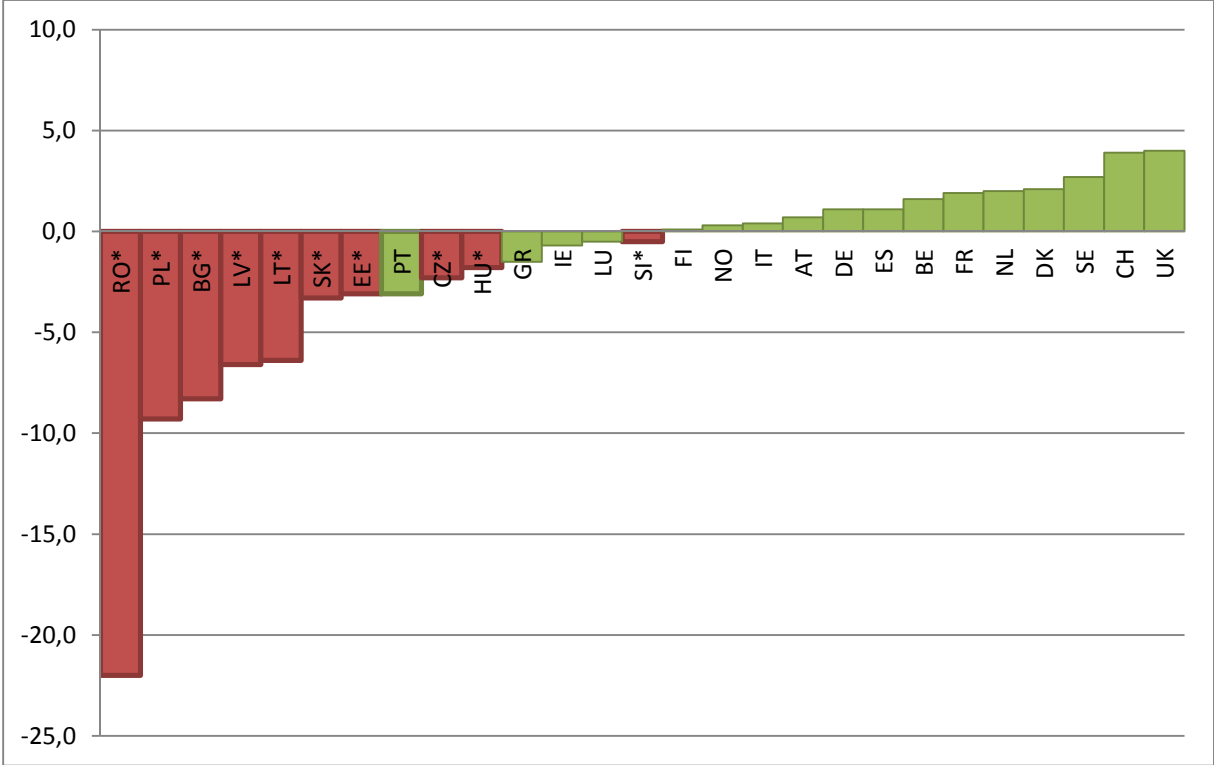
There are clearly differing trends in the development of rail modal shares between Western and Eastern European countries. There is a significantly positive trend in both freight and passenger sectors for the West, and negative in freight for the East. Western European countries are richer; they are able to allocate sufficient funds to infrastructure investment (high-speed rail, dedicated freight corridors) and to financing public service obligations. Their governments and public opinion understand that a functioning railway system has to be supported by significant government subsidies. In Eastern Europe, though, such stable financing is lacking, infrastructure is in poor condition, and the finances of the national incumbent are in long-term decline. Therefore, vertical separation and competition entry in these countries may have adverse effects on modal shares because new competition is attacking the most profitable of the incumbent's operations and without sufficient public grants, less attractive segments of rail markets are neglected (wagonload traffic, regional traffic, infrastructure investment). The decline of modal shares in Eastern European countries is further stimulated by the fact that postcommunist countries have high rates of structural changes in the economy, with many vanishing companies and many new enterprises established on brand new locations. These new establishments are close to road, and rail with its inflexible infrastructure can hardly compete. It is a paradox that Eastern European countries have very high rates of growth in the total transport market. In the period 2000–2011, the total transport freight market grew in the East by 75% (the West saw a decline of 1%), and in passenger market it grew by 24% in the East and only by 12% in the West (European Commission, 2012). However, railways in the East were unable to participate in this growth and it was captured almost entirely by road transport, which resulted in drop of market shares for railways.



Graph 1: Change in rail freight modal shares (percentage points) 1995–2013



Graph 2: Change in rail passenger modal shares (percentage points) 1995–2013



The disaggregated analysis shows that modal shares of rail went down in every single Eastern European country, both in passenger and freight. Apart from Eastern Europe, the disappointing development in the progress of rail modal shares could also be observed in Greece and Portugal for passenger and in Ireland, Luxembourg, Spain, and Portugal in freight. This may support the hypothesis (Nash 2013) that good results of European reforms may be concentrated in the geographic core of the EU; however, the results are much weaker on the periphery. Core countries of the EU can better utilise the benefits of vertical separation and competition entry whereas periphery countries may be left only with higher transaction costs. This may support conclusions of many authors (Finger 2014, Friebel et al. 2007) that say that there is no one solution for all countries, and those reforms should be more targeted to the needs of individual countries.

It is possible that the regression analysis could be influenced by some outliers, especially by Romania in the passenger transport sector and by Bulgaria and Poland in the freight transport sector. These countries' trends were included in additional regressions in order to control for these outliers and the basic results of the analysis were not changed. However, there is a point at which the presented results could be influenced by idiosyncratic factors especially when the number of countries is small. The group of countries that made horizontal separation but not freight privatisation consists of only three countries, all of them in Eastern Europe, and therefore more cases would be helpful for identifying more robust relationships.

The regression analysis could be enhanced by including more control variables that have not been included due to lack of complete and consistent data. Especially helpful and promising would be inclusion of variables controlling for level of subsidies, level of prices, and quality of infrastructure. Further possible improvement of this analysis could be more detailed construction of a competition entry variable. Mizutani et al. (2015) constructed a composite indicator for competition entry. The other possibility would be to create more competition dummies according to the type of competition entry. The competition entry can occur by open access, competitive tendering, or direct awarding. It would be interesting to control for different types of competition entry, because there is some evidence that recent full-scale open access competition entries may actually increase ridership significantly (Cascetta-Coppola 2014, Tomeš et al. 2016).

## **5. Discussion**

The vertical separation and competition entry in the railway industry may be a way to create more open and integrated railway markets in Europe; however, according to regression results, these reforms are not increasing modal shares of railways on the transport market. The possible reason for this is that they probably do not target the most important factors causing the long-term decline of railways in Europe. The highest impact on modal shares had GDP per capita with strong negative effect (especially in freight). This effect suggests that long-term structural trends in the railway industry may be hard to reverse because higher levels of income per capita lead to shifts from a product-based economy to a service economy and to a higher preference of individual transport. The main advantage of vertical separation (Deville-Verduyn 2012, Kurosaki 2008) is the support of effective functioning of competition. However, the effect of competition on modal share of railways seems to be insignificant, too. Therefore, this supports the opinions that stress disadvantages of vertical separation such as increased transaction costs and misalignment of incentives (Nash et al.

2014, Pittman et al. 2007, Pittman 2005). There is substantial evidence that vertically integrated structures without significant competition entry can perform reasonably well both in terms of efficiency and output as a result of strong intermodal competition (Desmaris 2014, Seabright et al. 2003). The main advantage of such integrated structures lies in the better timetabling, coordination of investment, and long-term planning. There are also better incentives to coordinate investment and operational needs of the whole railway system. Moreover, in vertically integrated structures, it is also possible to ensure the non-discriminatory entry of competitive operators.

Based on regression results, horizontal separation generates better economic results than vertical separation and/or competition entry. What are the possible reasons? Basic economic reasoning would suggest that common operation of passenger and freight operations should lead to cost synergies and better outcomes than in the case of horizontally separated units. But the situation is not so simple. The operation of passenger rail transport is unprofitable in almost all developed countries and is heavily subsidised from public budgets. The politicians are willing to subsidise rail transport but they want to see cheap and reliable passenger transport, because it can be sold to voters as a result of successful economic policy. There is a risk that in the decision making process of horizontally integrated structures the needs of passenger transport will dominate over the needs of freight transport. The preference of passenger transport in European railways can be observed in many aspects, starting with prioritising and allocating infrastructure capacity and attractive timetable slots to passenger trains, massive investment into passenger HSR lines in Western Europe, and cross-financing of passenger transport losses from freight profits in Eastern Europe.

Under such arrangements, horizontal separation of passenger and freight operations of the incumbent can bring about many advantages. In horizontally separated structures, the freight transport is no longer dominated by the needs of passenger transport and it could be more freely developed due to higher managerial and financial independence. These arguments are strengthened, when horizontal separation is supported by privatisation. Even if the privatisation is into hands of another European incumbent, it may be very helpful. The strong owner from a foreign country is not so much connected to domestic political representation and labour unions and can develop its freight division without substantial concessions, with better results for efficiency and demand. The horizontal separation and privatisation of freight can have positive effects on passenger operations, too. The impossibility of cross-financing pushes for clarification of public service obligation and calls for their stable long-term financing.

The conclusion that horizontal separation of the railway incumbent may be a more promising reform strategy seems to be supported also by the experience of other non-European countries. The horizontal separation used to be part of some successful railway reforms. The railway reforms in Japan, United States, and Canada (Gómez-Ibáñez - de Rus, 2006) all included horizontal separation of passenger and freight operations and these reforms can be considered as a success. The principal advantage of horizontal separation is the fact that it enables clear division of commercial and public service activities and each division can fully concentrate on its core business. Also the privatisation of rail freight operations (unlike passengers and infrastructure) usually brings about successful results worldwide.

Postcommunitic Eastern Europe is in a special position for the assessment of reforms. The railways of this region are in chronic financial deficit, infrastructure is falling apart and advantages of rail

transport are not fully utilised. The European reforms in these countries were usually understood as the way to solve railway problems of falling outputs and rising debts. However, it is not always appreciated that also necessary is an allocation of sufficient funds to infrastructure and public service obligations financing. These funds are lacking in these countries and even an inflow of European structural funds has not been able to change the situation. Without sufficient public funding, it is not surprising that vertical separation and competition entry are further weakening shaky domestic railway incumbents with adverse effects on modal shares of railways. Moreover, many Eastern European countries are geographically and economically small and it is questionable whether they are big enough to host competition. Also their share of freight in the total railway system is higher than in their western counterparts and therefore horizontal separation and privatisation may be an especially promising strategy because they transfer the ownership of freight division into the hands of a more experienced and capitally stronger owner. The infrastructure and passenger operations are in need of stable government financing. The governmental support for railways is crucial and vertical separation and competition entry alone cannot increase market shares of railways.

## **6. Conclusions**

There is no proof that principal European reforms (vertical separation and competition entry) increase modal shares of European railways. The impact of vertical separation was negative in the passenger sector and insignificant in freight. The impact of competition entry was insignificant in the passenger sector and weakly negative in freight. A more promising strategy is horizontal separation, especially when followed by privatisation of freight operations. This policy eliminates internal cross-subsidies, gives higher independence to freight, and lessens political pressures with a positive impact on freight's modal shares. There are also striking differences between trend developments in Western and Eastern European countries. There is a significantly positive trend in both the freight and passenger sectors for Western countries, and a negative trend in freight for Eastern countries. Many Eastern European countries have small internal markets, low infrastructure quality, lack of public funds, dynamic structural changes and weak regulation. The vertical separation and competition entry do little to target these problems and other reform packages may be more suitable to stabilise market shares of railways in these countries. Such reform packages could include horizontal separation and privatisation for freight and long-term commitment to stable public financing for infrastructure and passenger public service obligations.

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