Competition Limits in Railway Transport[1]

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Abstract

The aim of the paper is to assess advantages and disadvantages of the policy of railway separation (unbundling) of infrastructure and services. The policy of vertical unbundling is an attempt to introduce competition into the provision of railway services. The vertical unbundling strategy in railways has been strongly advocated by the European Commission as a possibility to increase competition and efficiency in this sector. The strategy has been applied since the beginning of 1990's in many European countries with varied energy, depth and timing. An evaluation of vertical unbundling strategy reveals both positive and negative aspects. On the positive side there are clear indications that introduction of reforms has improved efficiency. But it is evident that power of competition has significant limits in railways due to numerous specifics of this unique industry. If the unbundling policy has more advantages than disadvantages is subject to debate but there are strong indications that there are also other possible ways of combating inefficiencies in the railway sector.

Keywords: *railways, natural monopoly, unbundling, infrastructure*

JEL Classification: D23, D24, L92, R41

1. Introduction

Railways have a long history of operation. Unlike the majority of other transport modes, they have been founding themselves in a situation of a long-term decline of output and market shares. Their golden age was in the second part of the 19th century, when major rail lines were constructed and a basic skeleton of the railways networks emerged. Construction and operation of railway lines used to be closely interconnected. Railway companies usually built up a single line and subsequently run its operation. A strong process of mergers and acquisitions

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followed thereafter. A consequence was an evolution of strong companies both owning and running the complete networks of the railway lines. This development was backed up by state interventions into the industry with respect to military and industrial goals. The intention was to create strong national railways to declare national strength and to promote industrial development and military defence. The railway companies were either directly in state ownership or in private one with strong state regulation and subsidisation. The railways in twentieth century Europe emerged as big, national and state-owned companies operating both the infrastructure and services. Due to the rise of other transport modes in the 20th century, troubles came to railway industry. The railway companies were losing shares on the transport market, failed to respond to customers changing needs and started to accumulate financial losses. Because the railway companies were state-owned, there were recurrent calls for reform. The path of reform that was finally adopted in Europe was unbundling the railway infrastructure from operation of services. This policy was first tried in Sweden and the UK and then accepted by the European Commission as a universal receipt of railway reforms in the EU. The idea of railway unbundling is based on the belief that railway infrastructure is a case of a natural monopoly, but services could be provided on a competition basis. The aim of this paper is to assess advantages and disadvantages of such policy.

Railway business is characterized by substantial and long term investment in infrastructure that is specific and very costly. The estimates are as 1 km of new railway track in Europe is costing between 6 million and 10 million euros and the total costs of infrastructure including maintenance and renewals is about 30 billion euros annually (Di Pietrantonio and Pelkmans, 2004).

The costs of infrastructure are not homogenous. They depend firstly on topographical conditions and secondly on the purpose because railways infrastructure that is serving to freight transport only is much cheaper than infrastructure serving to passenger transport because of much higher safety and comfort demands. The high fixed costs of infrastructure mean that it is usually not economically viable to construct parallel railway lines. The railway infrastructure is very specific, has no other use and has minimal scrap value. There is very little scope for competition in railway infrastructure and the usual way of competition in infrastructure is through other modes of transport. Infrastructure costs therefore determine the general costs structure of the entire industry. According to references, infrastructure costs account for a substantial part of the total costs of the industry. The share has been guessed like 50% (Di Pietrantonio and Pelkmans, 2004). And about 50% till 80% of infrastructure costs are fixed in the short run (Nash and Preston, 1993).

These sunk costs determine financial rentability of the railway industry. Railways need concentrated flows of traffic in order to reap economies of scale and density. Falling railways shares on the transport market mean that many of those economies were lost and probability of their recapture is low. Falling competitiveness has been pushing railways in a circle. The falling market shares are causing the loss of economies resulting in financial losses of railways causing underinvestment, lower quality of services and fostering further decline of market shares.

2. The Idea of Unbundling

The railway enterprises had disappointing results in the second part of the 20th century. They were confronted with tough market competition of road transport and they were continually losing their market shares. In general, the railway operators were not capable of adapting to new conditions where they have to compete with flexible and market oriented road operators. Railways were historically oriented on the safety, technical and military aspects of their business. They were poorly equipped to meet the challenges of the structural change that took part in transport business. The big monolithic railway companies with strong organizational and financial ties with state reacted only very slowly to changes in customer demand. Lost market shares in both passenger and freight transport followed. The missing market revenues had been replaced with higher and higher public subsidies. Once profitable passenger transport started to be a loss-making activity, at least at regional level, and it has to be heavily subsidized to keep it in operation. The typical European railway enterprise was a big monolithic structure with low responses to customer needs and generating huge losses covered by public subsidies. This unsatisfactory situation led to widespread calls for reform.

This request for a change was answered with the policy of unbundling. In accordance with general liberalization commitment in other industries it was tried to bring competition back on the track. It was generally acknowledged that the railway infrastructure is subject to a natural monopoly. But providing of services was viewed as a potentially possible of competition hosting. The policy was first tested in Sweden and the UK. The same receipt was lately applied to other European railways. The idea behind the unbundling of railway infrastructure and services is to introduce competition in railway business and to promote efficiency in the industry. There is a hope that unbundling together with open access to infrastructure will generate better services and diminishing losses of railways operators. The separate infrastructure means that new entrants on the market are not excluded by the very high entry barriers which are formed by high infrastructure costs. This approach was in accordance with the policies in other network industries, where it was believed that it is necessary to accept natural monopoly in the infrastructure but that it was possible to introduce a competition in service providing and hence to increase their performance and to enhance their financial stability. Moreover it was believed that vertical unbundling will discover true costs of providing railway services. The policy of vertical unbundling has been defined and implemented in the series of directives. They were targeted at the introduction of vertical unbundling, open access and competition promotion. They were issued step by step in the Directives of 440/1991, 18/1995 and 14 – 16/2001 of the European Commission. The vertical unbundling should improve the flexibility of railway operators through more intensive competition and subsequently decrease public subsidies to the railway sector. The vertical separation framework has been adopted in European countries with varying depth and enthusiasm. The European directives do not explicitly require organizational separation of infrastructure and operations. They do require accounting separation and open access to the track. There are different strategies how such policies have been applied in European countries. Germany let infrastructure manager and service provider integrated in one firm. The competition was put in effect on regional passenger lines and in railway freight sector. France chose a different path. It made a complete separation of the infrastructure and services but the main goal was to diminish powers of the former state monopolistic railway company. Actual competition is not emerging and it is not intended either. Sweden was the first reformer; the basic reform goal was to put road and rail infrastructure on the same foot. Britain was the most dedicated reformer with vertical unbundling followed by fragmentation and privatization of the industry. Eastern Europe countries generally chose the strategy of complete organizational separation of the infrastructure manager and the incumbent operator.

3. Advantages of Vertical Separation

3.1. Effectivity Improvement

The benefits of vertical unbundling result mainly from introducing competition on the track and promotion of profit-oriented behaviour. The result is a pressure for more demand-oriented behaviour. Unbundling railway monopolies is the way how to persuade managers and employees of the railway companies that both costumers' needs and railway costs are important. The introduction of competition is hoped to bring more flexibility to railway business and it is thought as a necessary step to discover possible costs cuts in the industry. More competition should bring more pressure to increase output, performance and profit. It is also very desirable to attract private capital into railway enterprises. Such a policy should outsource part of the government risks, because under a threat of bankruptcy, there should not be possible to cover loss by never-ending loans directly from the state or from banks with state collaterals. It is supposed that main beneficiaries from the introduction of competition will be customers. More choices, better services and lower prices should attract new customers and guarantee the long term viability of the railway transport.

The introduction of reforms and promotion of competition actually led to improvement of efficiency. Studies indicate that as result of reforms there are significant improvements. Asmild et al. (2009) measure a change of productivity in 23 European countries using multi-directional efficiency analyses and they conclude that the reforms do have positive effect on efficiency. Friebel, Ivaldi and Vibes (2010) estimates the increases of productivity in 12 European countries in the period of 1980 – 2003 and results are about 0,5 % increase of productivity per year after the start of reforms. But results depend on sequencing of reforms. The sources of efficiency improvement are in the growth of output and in the decline in the number of employees. For example as a consequence of market reforms the number of employees decreased in Sweden (1987 – 1993) from 29.000 to 14.000 and in Germany (1993 – 1996) from 350.000 to 250.000 (Quinet and Vickerman, 2004).

3.2. Weakening the Relationship between Railways and the State

The state of European railways in recent decades has been negatively influenced by the strong organizational ties with the state. The state subsidized operational losses of railway businesses but on the other side this relationship undermined the commercial viability and flexibility of railway companies. They have been forced to fulfil noneconomic goals in the field of social policy and regional cohesion. The profit was negatively influenced and this relationship led to bureaucratic behaviour and state culture in railways companies. The desire to weaken this relationship should lead to a reduction of public liabilities, because the state is no more primarily responsible for the railways operation and their financing. The competition for the market and for subsidies should bring more reliable information about real costs of transport services. The subsidies for public service obligation in transport could be substantially decreased and could go directly to particular route and not to railways as a company. The weakened relationship should also lead to more effective regulation in the railway industry because it is very often used to serve social oriented goals. Loosening the relationship between the state and dominant railway operator should guarantee that the state will be no longer responsible for social function of railway transport and also for the employment and wages of railway employees.

4. Disadvantages of Vertical Separation

The process of vertical unbundling has also its costs and disadvantages. They result mainly from the necessity of coordinating activities that used to be performed inside one organization. The most important are as follows:

4.1. Increase in Transaction Costs

Newly separated companies have to face a substantial increase in their transaction costs. The vertical separation leads to market coordination of activities that used to be performed in one firm. There are strong links in the field of operational and safety management in the railway business. The long term decisions in railways such as investment and operation of tracks or the purchases of locomotives and wagons are closely interrelated and optimally should be coordinated. Separation is definitely decreasing level of coordination in the industry and it is introducing substantial transaction costs of coordination of such activities. Historical experience also does not seem to support vertical unbundling strategy. The railways operators usually build up a line and subsequently operated trains on it. Enabling access to competing firms was very rare. Another argument is that vertical unbundling in other network industries has been done in the situation of positive profit in the industry, but present financial situation in railways is just the opposite. The idea behind vertical unbundling was to introduce market competition. But even after unbundling there is still natural monopoly in infrastructure and strong barriers to entry still exist in the operation of services due to high costs of rolling stock. The possible outcome of vertical unbundling strategy is an emergence of many small local monopolies instead of one national.

4.2. Infrastructure and Investment Misallocation

The vertical unbundling strategy targets primarily operational costs of railways undertakings through competition pressures. But very important aspect of railways economics is costs of infrastructure. The unintentional consequence of railway reform was that infrastructure manager in many countries emerged as a public company with little incentives to profit behaviour. The infrastructure costs are an important determinant of the entire industry. Especially in Europe as result of a high share of passenger transport the costs of infrastructure renewal and maintenance are extremely high. The vertical unbundling policy caused the separation (both accounting and real) between operational and investment decisions. There is a risk of investment misallocation as a result of separation. In many European countries the investment rentability is not an objective relevant in the process of investment decision. There is a risk that infrastructure manager will fall out from profit maximization behaviour because it will start to be considered as a public service without relation to the real costs. The infrastructure managers usually don't have strong incentives to behave efficiently.

4.3. Regulation Failure Risks

The vertical unbundling process requires establishing the regulator which will supervise emergence of competition. It is a paradox that as a result of market reforms there is a higher necessity to regulate the industry. It is necessary to allocate scarce slots for open access in advance in order to constitute reliable timetables, so competitors have to buy it without knowing the precise demand for its operation. This information uncertainty has consequences for their investment planning. Moreover the access fees are charged on the principle of marginal costs. But such pricing does not guarantee any rentability of infrastructure investment. There is a latent conflict between the goal of competition promotion based on low access fees and the goal of financial rentability requiring repayment of infrastructure investments.

4.4. Different Countries

One particular problem present in the European strategy of vertical unbundling in railways is that it prescribes the policy of vertical unbundling to all countries irrespective of their size. But the fact is that European countries differ very substantially in the size of their internal transport market. The potential competition at the railway market is facing substantial legal and technical barriers to entry and to overcome them it is usually necessary to attain some economies of scale. But some smaller European countries may possess too small transport markets to host potential competition. There appears to be important difference between the possibility of competition on the internal railway market among big, medium-sized and small countries. According to Pittman et al. (2007) the competition in freight railway transport in Eastern Europe is emerging in Poland and Romania, but it is weak or nonexistent in the Czech Republic, Slovakia, Hungary and Bulgaria. They propose that different size of domestic markets may be an explanation for this different development. Friebel et al. (2007) also point out that freight railway transport is much more important in Eastern European countries than in Western Europe and the enforcement of contracts and rule of law is also much weaker in Eastern Europe so it is questionable whether one solution is really appropriate for all European countries.

5. Assessment of Vertical Unbundling

The vertical unbundling strategy is an attempt to promote competition through the separation of infrastructure and services. In order to assess the viability of such reform strategy it is important to take into account the fact that railway transport is already under intensive competitive pressure from other transport modes and it is questionable whether intra-modal competition in the railway sector is helpful under such conditions. Historical experience is also not very supportive to the idea of vertical unbundling. The railway companies evolved themselves as vertically integrated and enabling open access to other railway companies used to be a very rare occurrence. It seems that analogy to other network industries and to other transport modes such as cars and roads has its limitations in case of railways. Railways enterprises are typical by close interconnections between infrastructure and services and their division without adverse affection of various economies is difficult. Anyway the vertical unbundling strategy is leading in some countries to an emergence of actual competition and in other countries the intensity of competition is very low. What are the reasons for this difference? At first some states have been quite reluctant to accept the idea of train to train competition (e.g. France or Spain) and actually have not been very active in its promotion. But probably more important reasons for the emergence of competition have been the size of the market and some markets of the smaller countries may be too small to host an effective competition. This is particularly important because vertical unbundling is connected with important incurrence of transition costs. Vertical unbundling leads to higher needs of coordination between infrastructure manager and provider of services that now has to be done outside one firm and such development leads to an increase of transaction costs and for smaller European countries it is questionable whether these additional costs are really worth of the benefits.

There are also policy options to the vertical unbundling in the case of railways reforms. Many countries outside Europe have chosen different path and different priorities in their railway reform attempts. A possible option is the horizontal separation of railways into a few vertically integrated railway companies. They can be divided alongside regional borders and as such to compete with each other on the fringe of the market or indirectly. This solution has been applied in Latin America and Japan. The other possible reform path is privatisation. In the UK, the US and many other countries of Latin America railway companies were licensed or privatised. Such policy seems to be closer to the goal of efficient, competitive and self-supporting railways. The European model that is lacking both demonopolization and privatization is left out only with the possibility of open access to the existing network. This has the disadvantage of preserving state responsibility for railways problems. Historically, the state has been too much engaged in European railways business. The state subsidized railways operation and infrastructure, covered railways losses and guaranteed employment. The European reform of open access is not contributing very much to suppression of such relationship. The American model of demonopolization, deregulation and privatization is much more powerful in combating railways inefficiencies. Railways operators are smaller, so they are in a weaker position against the government, privatization means that the responsibility for infrastructure investment and operational profits are definitely shifted to private firms and there are no more demanded from state budget.

Conclusions

The policy of vertical unbundling is aimed to introduce competition into the railway services providing. The idea is in accordance with liberalization movements in other industries and it is based on the acceptance of natural monopoly in infrastructure but it tries to pursue competition in providing services. But its practical application is made difficult by the fact that railway transport is very specific in comparison with other industries. The most important gain from unbundling is promotion of market oriented behaviour. The focus on the market incentives goes hand in hand with decreasing state intervention and it is hoped it will provide more satisfactory results in railway effectiveness. The other advantage of unbundling is a decrease in the intensity of relationship between railways and the state. The principal disadvantage of the strategy of vertical unbundling is that it leads to a substantial increase in the transaction costs. The activities that used to be performed in one firm are now divided into two entities which may or may not cooperate in decision-making. Investment and operational decisions are closely interconnected in railways and their separation may be harmful due to numerous complexities in this unique industry. Railways companies in history used to be vertically integrated so there is little clue that vertical unbundling is a natural state of affairs in the railway business. The process of unbundling and its consequences may be especially doubtful in case of new member countries of the EU, where market institutions are weak and decision-making in the complex world of railways may be performed inside one firm more easily. Moreover the vertical unbundling strategy is that it is recommended for all member states of EU irrespective of the size of their domestic market. There are also policy options to vertical unbundling. There is the possibility of geographical fragmentation and privatization as was tried in many countries outside Europe.

References

ASMILD, M. – HOLVAD, T. – HOUGAARD, J. – KRONBORG, D. (2009): Railway Reforms: Do they Influence Operating Efficiency? Transportation, *36*, No. 5, pp. 617 – 638.

DiPIETRANTONIO, L. – PELKMANS, J. (2004): The Economics of EU Railway Reform. [Bruges European Economic Policy Briefings (BEEP), No. 8.] Bruges: College of Europe.

FRIEBEL, G. – GURIEV, S. – PITTMAN, R. – SHEVYAKHOVA, E. – TOMOVA, A. (2007): Railroad Restructuring in Russia and Eastern Europe: One Solution for All Problems? Transport Reviews, *27*, No. 3, pp. 251 – 271.

FRIEBEL, G. – IVALDI, M. – VIBES, C. (2010): Railway (De)Regulation: A European Efficiency Comparison. Economica, *77,* No. 305, pp. 77 – 91.

NASH, C. A. – PRESTON, J. (1993): The Policy Debate in Great Britain. In: NASH, Ch. (ed.) (2002): Railways. Classics in Transport Analysis. Edward Elgar Publishing. ISBN 1840645539.

PITTMAN, R. – DIACONU, O. – SIP, E. – TOMOVA, A. – WRONKA, J. (2007): Competition in Freight Railways: "Above the Rail" Operators in Central Europe and Russia. Journal of Competition Law and Economics, *3*, No. 4, pp. 673 – 687.

QUINET, E. – VICKERMAN, R. (2004): Principles of Transport Economics. Edwar Elgar Publishing. ISBN 1 84064 865 1.