

# METHODOLOGICAL PRINCIPLES OF FORMATION OF TARIFFS FOR RAILWAY

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## **Authors' contributions**

*This work was carried out in collaboration between all authors. Author DA designed the study and defined the motivation for the paper as well as the research objectives. Author MYTAD wrote the literature. Author MA did the analysis and discussions. All authors took part in the writing of the conclusions and discussions, read and approved the final manuscript.*

## **Article Information**

## **ABSTRACT**

**Aims** of the paper is research scientific and methodological approaches that affect the efficiency of government regulation of tariff for railway transportation industry in both sectors.

**Study Design:** The study uses an Exploratory Design.

**Place and Duration of Study:** Ukraine, between the periods 2015 to 2016.

**Methodology** employed was the Narrative Textual Case Study (NTCS) method, while non-probability and convenience sampling technique was used to select the sample size.

**Results:** The study found that in the current economic conditions the implementation of administrative regulatory infrastructure component makes use of unilateral restriction that allows the cost recovery fees for services infrastructure and determine the volume of necessary financial support in case of unprofitable rates. Regarding the operational component, the creation of tariff conditions for competition requires bilateral limit, which allows to determine the economically justified the lower and upper boundaries within which the price depending on the factors set fees sphere of operation. This approach to pricing regulation in potentially competitive sector allows carriers to limit the boundaries of flexibility

34 to respond to changing conditions of transport markets, consider the price elasticity of  
35 demand, positive trends in the use of the laws of the market economy. Sharing unilateral  
36 restrictions to justify the fees for services natural monopoly and bilateral - in potentially  
37 competitive services sector is a competitive motivational method of pricing, which meet the  
38 requirements of effective functioning of natural monopolies in the market environment, and  
39 provides irreversible monopolization of potentially competitive sectors.

40 **Conclusion:** Using of competitive motivational method for pricing regulation will establish  
41 market-oriented competitive tariffs for freight and passenger transportations, and also  
42 promotes creation of conditions for adaptation of railway transport to enhance competition in  
43 the transport market.

44

45 *Keywords:* monopoly; railway industry; pricing regulation; production volume; competition;  
46 natural monopoly; potentially competitive sector.

47

## 48 **1.INTRODUCTION**

49 The transition to market economy requires adaptation of government regulation of tariff on  
50 passenger and freight rail transport of Ukraine to the current requirements. Necessity of  
51 government regulation of tariffs for railway caused in the first place, the distribution of the  
52 railway industry in natural monopoly and potentially competitive sectors, and secondly, the  
53 monopoly position of railways in the market of railway transport, and thirdly, establishing high  
54 monopoly prices for services rail transport in natural monopoly sector. In particular, the use  
55 of government regulation of railway tariffs due to the need to enhance competition and  
56 ensure a smooth transition to free pricing in the sector of operation, and to prevent the  
57 establishment of unjustified levels of tariffs for natural monopoly sector.

58 As market conditions rate is an important factor affecting both the financial condition of  
59 railways, and the performance of individual sectors and the economy, as a whole. Railways  
60 set a high tariff levels, requiring constant regulation of pricing in order to balance the  
61 interests of all participants in the transportation process.

62 Meanwhile, existing methods for regulation of tariffs for railway transportation in conflict with  
63 the requirements of market economy, holding back market reforms in the railway sector,  
64 reducing the effectiveness of its functioning and slowing economic growth in the country.

65 Increased competition in the transport market requires constant adaptation to the railway  
66 industry market environment, which necessitates the use of competitive motivational method

67 of regulating tariffs for railway transportation of Ukraine for the effective functioning of the  
68 industry and the economy as a whole.

## 69 **2. LITERATURE REVIEW**

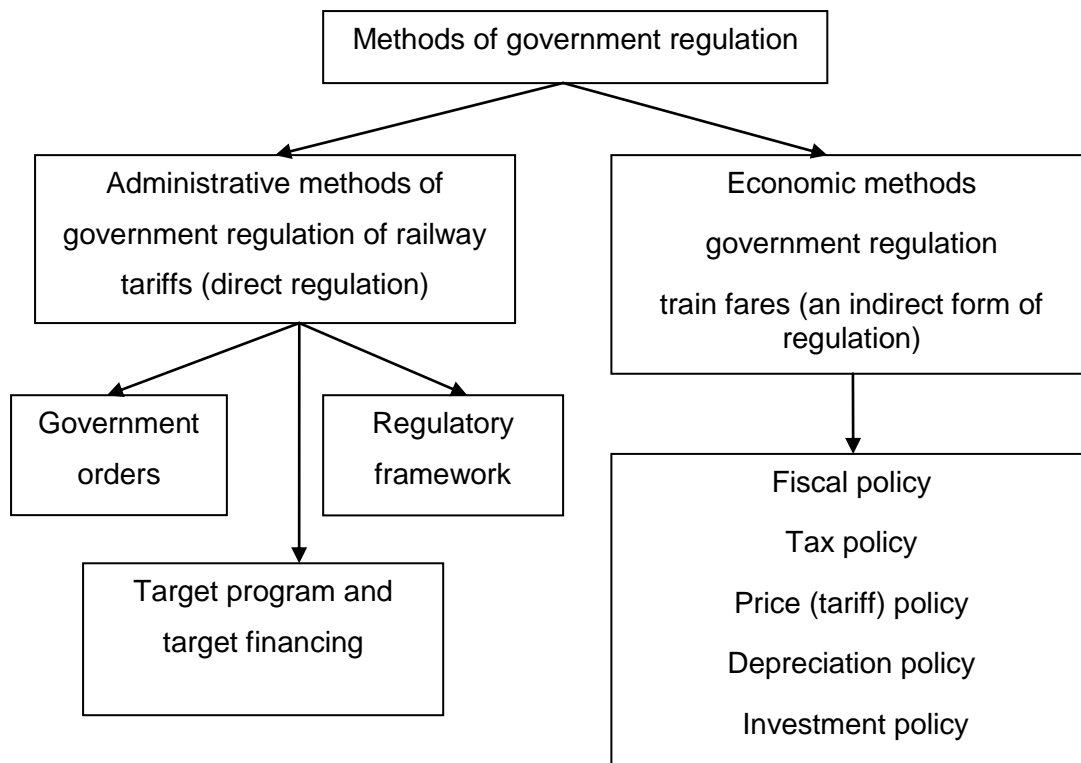
70 The study of government regulation of tariff for railway very important today. Ukrainian  
71 scientists work devoted to this issue Kolesnikova N.M, Bulgak V.A, I.P Ilyin etc.  
72 (Kolesnikova N.M., 2015), (Bulgak V.A., 2009), (I.P Ilyin, 2012) [1], [2], [3], but none of these  
73 authors did not study the scientific and methodological approaches to the government  
74 regulation of tariff for freight and passenger rail transportation.

## 75 **3. METHODOLOGY**

76 The main purpose of Railways in the conditions of development market relations is obtaining  
77 the maximum possible profit and satisfaction of consumer needs in full. Lower profits in the  
78 industry reduces its capacity and maintenance in proper condition of material-technical base,  
79 and the complete disappearance of profit will cause the removal of capital from the industry.  
80 It is therefore considered necessary to conduct a study of scientific and methodological  
81 approaches to government regulation of tariffs for railway transportation, with the aim of  
82 achieving goals that are different for both sectors of the railway transport.

83 Tariff policy in respect of transport services mostly depends on the government approach to  
84 the system of tariff setting. Government regulation of tariffs on railway transportation should  
85 be carried out by administrative and economic methods of regulation, and this classification  
86 is given in fig. 1.

87 The administrative method of government regulation of tariffs for the services of the railways  
88 is a regulation using the tools of the regulatory framework and government influence on the  
89 regulation of tariffs for transport services. The use of this method of regulation for the  
90 services sector of the railway infrastructure caused by natural phenomena and is due to the  
91 fact that this sector, according to the Law of Ukraine "On natural monopolies", is the subject  
92 of natural monopoly (The Law of Ukraine "On natural monopolies", 2013) [4]. The tools of  
93 the administrative method of regulation of tariffs for services of railways are government  
94 orders, regulatory framework, target program and target financing.



95

96 Figure 1. Classification of methods of government regulation of tariff for railway services

97 **3.1 Statement of the Problem**

98 Providing the necessary legal framework is a priority for the operation of any entity.  
 99 Currently, legislation on price regulation for services not both sectors is systemic and needs  
 100 improvement. Therefore, to improve the competitiveness of the railway sector and improve  
 101 its functioning should be divided natural monopoly and potentially competitive sectors of  
 102 railways, and appropriate legal framework for government regulation of pricing the services  
 103 sectors both railways. This, in turn, requires changes in existing regulations and laws (in this  
 104 case, some of them will be the same for both sectors of railways, and some will be different,  
 105 and can be used to regulate only one of the sectors).

106 Developed and introduced new legal framework will set fees for the use of infrastructure in  
 107 the form of regulated tariffs and sector of operation to promote the transition to free prices  
 108 from active competition between carriers for the provision of services. In the infrastructure  
 109 sector always operate instruments of government regulation of tariffs as railways  
 110 infrastructure is the subject of natural monopoly. But the sector operated by means of  
 111 government really necessary for monopolistic competition in which entities set  
 112 monopolistically high prices which do not conform to society's ability. Therefore, the

113 transition from monopoly to free competition in the area of operation will increase the  
114 efficiency of rail transport.

115 Targeted funding and public contracts as tools of government regulation of tariff  
116 transportation service mark its influence on regulation freight and passenger rail  
117 transportation. According to the Law of Ukraine "On Railway Transport" targeted funding to  
118 be provided by the government budget of Ukraine (The Law of Ukraine "On Railway  
119 Transport", 1996) [5]. The need for public funding of infrastructure sector is the result of  
120 government regulation, since the government insists on setting too low tariffs for  
121 infrastructure sector to meet the needs of society. But given the government level of tariffs  
122 does not provide the normal reproductive process of the railway infrastructure and railway  
123 transport losses are at regulated tariffs.

124 Therefore financing of natural monopoly railway sector should be provided as fees for the use  
125 of infrastructure and by grants from the government and local budgets. The infrastructure  
126 sector is under the supervision of the government, and the fee for the use of railway  
127 infrastructure is regulated by the government and budget financing should ensure the  
128 implementation of the government control infrastructure, support for rail infrastructure  
129 transport system and target subsidies to unprofitable shipments.

130 Target program for the development of railways are divided into medium and long-term  
131 government program not only for reconstruction, but in some cases new construction of rail  
132 lines. Targeted funding requires addressing the issue of public funding of infrastructure  
133 construction, which are protective, national and regional importance; attract funds from  
134 national target programs, budgetary subsidies for infrastructure development, providing  
135 transportation for government needs and socially important transportation. Solving these  
136 problems will have a positive impact on the establishment of fees for the use of railway  
137 infrastructure, since in this case there is the possibility to reduce the level of the tariff for its  
138 use.

139 Government orders represent a change for the infrastructure at the lower of cost and provided  
140 by the public administration financed from the government budget and designed to meet  
141 national needs. Government financial incentives, orders and purchases under the economic  
142 program has a significant impact on profitability, sustainability and competitiveness of the

143 railways, which positively affects the economy and increases the purchasing power of users  
144 [6].

### 145 **3.2 Model Specification**

146 Government regulation of tariffs for passenger and freight transportation in sector of operation  
147 through economic method is very efficient, because railroads continue to occupy a monopoly  
148 position in the market of railway transport. If the operation of monopolistic competition in  
149 the sector of operation, by virtue of objective economic laws (monopolization, concentration,  
150 centralization), the relevant entities will be combined to form a monopoly associations,  
151 enabling them to establish high monopoly prices. Creating a monopoly associations make  
152 medium and small carriers redirect their activities to other sectors of the economy. Factor  
153 countering this trend is only government regulation based on economic methods.  
154 Government regulation of tariffs in the sector of operation, with the objective economic law  
155 of competition should force entities compete with one another in response to changing market  
156 conditions. If the active promotion of competition in the sector operation considered  
157 appropriate gradual shift from direct government influence on the process of tariff for the  
158 services sector, said the railways. But the need for indirect government influence on fares is  
159 because it is necessary to gradually start using economic methods of regulation of tariffs [7].

160 The tools of economic methods of government regulation of tariff for the services of the  
161 railways is appropriate budget, tax, depreciation, investment and pricing policies.

162 Fiscal policy should include government funding losses from unprofitable railway transport,  
163 and the financing of reconstruction and modernization of the infrastructure sector. Tax policy  
164 should be aimed at the implementation of preferential taxes which will boost competition in  
165 the potentially competitive sector. The use of fiscal and tax policies in the sector caused by  
166 the operation of the need to ensure equal competitive conditions for all participants in the  
167 traffic, without creating undue competitive advantage to individual entities.

168 Depreciation policy aims to target the accumulation of money and use them to play worn  
169 assets and carrying value of fixed assets gradually worn on the cost of services provided by  
170 the railways. The government determines the order of depreciation, and the entity through  
171 accelerated depreciation reduces the amount of income subject to taxation, stimulating the  
172 rapid introduction of new technology [8].

173 One reason for high costs of maintaining the railway infrastructure is the lack of additional  
174 investment. Therefore, the main objective of the investment policy of government regulation  
175 of tariff for the services of railways is developing and enforcing mechanism to attract  
176 necessary funding for compensation as fixed costs in the process of transportation and  
177 investment into the infrastructure. In the absence of rail infrastructure investment from the  
178 budget, railways continue to carry unprofitable social traffic and work at a loss.

179 The main role in the whole system of government regulation of the economy plays to  
180 maintain an appropriate level of prices, because the imbalance price mechanism leads to  
181 devastating consequences. It is clear that pricing is the main hub of action for government  
182 regulation of tariffs for rail transportation. Upon reaching the free competition in the  
183 potentially competitive sector of the market will force independent of the carriers to reduce  
184 their costs, improve the quality of service provided by railways and the like. A necessary  
185 condition for the transition to free competition – free prices. In the result of the interaction of  
186 supply, demand, and competition set the market price, which should provide coverage of  
187 businesses and profits [9].

188 In the implementation process of freight transport is used as an infrastructure sector and  
189 sector of operation. In particular, in the area of operating with the method of administration  
190 need to move from monopoly to free competition, which will contribute to the introduction of  
191 free pricing in this sector. Freight transport is a continuation of the process of production, and  
192 the passenger meet the needs of consumers. Therefore, tariffs for freight transport should take  
193 into account the competitiveness of freight and passenger fares should focus on the effective  
194 demand of the population.

195 The process of passenger transportation sector provided the infrastructure and operation, but  
196 competition in the sector is no operation and 100% of the market belongs to the railways.  
197 Government intervention in the infrastructure sector with the administration method aims  
198 assumptions not setting high tariffs and the creation of conditions in which the rail tends to  
199 reduce their costs.

200 Thus, regulation of tariff for the services sector as infrastructure for freight and for passenger  
201 transport should be treated equally, and government regulation of tariffs for freight and  
202 passenger traffic in potentially competitive sectors of railways will be different.

#### 203 **4. RESULTS AND DISCUSSION**

204 To improve the actions of government regulation of tariffs for railway should consider the  
205 impact of administrative and economic methods of regulating the installation of infrastructure  
206 fees and the establishment of tariffs for operation in the sphere of passenger and freight rail  
207 transportation.

208 Consider the impact of economic instruments method for operating activities sector  
209 separately for freight and separately in rail transportation. Budget policy should be  
210 improved, to ensure the normal process of reproduction as a priority improvement are:  
211 reduction of budget funds aimed at directly subsidizing unprofitable rail traffic by profitable  
212 since unprofitable railway transport limit the ability to update the material and technical base;  
213 increasing use of budget financing of investment projects involving the private capital that  
214 will upgrade old and build new infrastructure on the basis of budget financing and involved  
215 the participation of private investment funds. Brought financial resources contribute to the  
216 development of infrastructure and provision of normal reproductive process; budget planning  
217 expansion, reflecting the strategic direction of transport, production capacity will keep repair  
218 facilities and provide the necessary amount of repair rolling stock in terms of increasing rail  
219 traffic [10].

220 Given the above, it can be noted that fiscal policy significantly affects the regulation of  
221 passenger transport, as the impact of fiscal policy on them is determined by the necessity of  
222 their funding from the government because they are unprofitable. To create competition in  
223 the field of passenger transport it is necessary at the legislative level to make a decision on  
224 liquidation of unprofitableness of the passenger terminal and to determine the feasibility of  
225 bringing the tariffs on passenger transportation services to the economically due to costs and  
226 the allocation of budget funds for compensation of losses of passenger transport, in  
227 connection with the exercise of their price regulation.

228 The first priority of tax policy is to develop programs that will contribute to building and  
229 enhancing an appropriate competitive environment, the long-term existence of free  
230 competition between operators on the basis of free prices.. Instruments of tax policy aimed at  
231 creating equal competitive conditions for participants of the transport process, allowing to  
232 increase the competitiveness of Railways on the transport market.



233 In the absence of legal documents defining the clear ideology of the tariff policy, it is not  
234 possible to exercise effective tariff regulation in the sphere of freight transportation on the  
235 railway transport. Pricing policy should aim at decision-making on the introduction,  
236 modification or cessation of regulation of railway tariffs in certain market segments of  
237 Railways.

238 Depreciation policy marks a significant impact on passenger and freight transportation. The  
239 high degree of depreciation of fixed assets that require large expenses for their current  
240 detention threatens the loss of technological stability railways and identifies the need for  
241 investment. The purpose of the investment policy updates and technical re-equipment  
242 production base process, transport, development of technological and social opportunities for  
243 the development of public transport demand increasing, and must ensure the formation of  
244 sources of financing of investment programs.

## 245 **5. CONCLUSIONS AND POLICY RECOMMENDATIONS**

246 Thus, all the tools of administrative methods of government regulation of tariff for services in  
247 the application infrastructure are important, but every tool of influence occurs at some point,  
248 that the first legal framework, public order and national target programs and targeted funding.  
249 Also, it is clear that economic methods of government regulation of pricing on service areas  
250 of operation of railway transport aimed at enhancing competition and did not have any impact  
251 on the infrastructure sector since the establishment in natural monopoly sector competition is  
252 not possible. Records obtained in the course of study in the development of government  
253 regulation of pricing on the railways will make it effective that today is very important for  
254 both the rail industry and to the economy [10].

## 255 **COMPETING INTERESTS**

256 Authors have declared that no competing interests exist.

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