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Thesis Title: Evaluating Economies of Scale and Scope in Japanese Railways

Abstract

Railway transportation in Japan became not only the network who distributes transporting services, but also manages the bus lines, taxi lines, super markets, department and convenient stores, hotels, even in some cases laundry and fitness service organizations. The diversification of services becomes a major phenomenon of railway sector particularly in developed countries. Japanese railway companies are typical case which, provide variety of services along with the operation of railway network. The hypothesis of the thesis is that, the operation diversified business in Japanese railways could contribute to the total operational cost reduction through existence of economies of scale and scope. A research question of this thesis is “Do the economies of scale and scope exist in the operation of Japanese railways network?” To answer this question, the objective of this thesis is to evaluate the cost structure, cost share structure, economies of scale and scope of Japanese railway companies. The model, used in this thesis is translog cost function and share equations. Where we did the estimation of cost and its cost share functions simultaneously by using the Seemingly Unrelated Regressions model. Also for the solution of the endogeneity problem of the second independent variable the output of diversified services we used three – stage least square (3SLS) method. We used the data of the Ministry of Land, Infrastructure, Transportation and Tourism of Japan for three years (2012, 2013 and 2014). The sample size is 210 of balanced panel data. Empirical results suggest that the estimated parameters of the output of railway services and diversified services are positive and statistically significant in cost and cost share functions. The estimated value of the elasticity of total cost with respect to each output are less than one. The interaction term of two outputs is negative and statistically significant. The results of year dummies of 2013 and 2014 are negative and statistically significant, which indicate that total cost was decreasing year by year. These results suggest the existence of the economies of scale and scope in Japanese railway network. These empirical results imply the diversification of the railway network in Japan contributes to their total operational cost reduction, and justifies the success of their development process.