Cost Benefit Analysis for free-fare ticket regional trains

Context

Europe has faced significant challenges in economic growth, inflation, energy prices, and stability due to the COVID-19 pandemic and the Russia-Ukraine War. To mitigate the impact of inflation and promote public transport, several European countries, including Germany, Spain, Luxembourg, and Estonia, have implemented various policies. One innovative policy is the introduction of free public transport, which aims to encourage citizens to use public transportation and alleviate their daily expenses. However, this policy can impose a substantial financial burden on public finances.

Germany implemented a three-month policy in June to August 2022, offering public transport for 9 Euros to reduce energy usage during the energy crisis and alleviate the cost of living crisis. Spain also introduced a plan for free public transport from September to December 2022, which was later extended throughout 2023. Similarly, cities like Tallinn and Luxembourg have implemented free public transport within their city regions.

While there are both benefits and costs associated with the free public transport policy, there have been limited quantitative studies assessing whether the benefits outweigh the costs. Utilizing data provided by ART, this study aims to conduct a comprehensive analysis of the socioeconomic factors associated with free regional public transport in France. Additionally, an Excel tool has been developed to facilitate the assessment of the socioeconomic relevance of free public transport.

Methodology

This project used the social-economic model, which count Change in Social Welfare as accumulation of Change in Traveller's Economics Surplus, Operator's Profit, External Costs and Public Finance. The change of traveller's economics surplus is equal to the value of fare savings, improved accessibility and affordability and time savings. By comparing this benefit to the cost of the policy, we analyse and provide a comprehensive understanding of the policy's economic implications.

PARIS SCHOOL OF ECONOMICS
ECOLE D'ÉCONOMIE DE PARIS

Autorité DE RÉGULATION DES TRANSPORTS

Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE

École des Ponts
ParisTech

Data & Assumption

According to an actual transport data offered by ART, a dataset about the actual demand and supply of public transport in each region during seven years from 2015 to 2021, the growth rate of the demand of the train is 3%. Applying this rate and the price elasticity with an assumption that the supply of the train will not change, the traveller's surplus can be calculated.

About the operator's profit, the loss of earnings linked to the policy of free public transportation will be compensated by an increase in subsidies from the state or region. We counted this compensation as a burden on Public Finance. In addition, there is two impacts on public finance, 1) the tax reduction caused by the lower car used on the road and 2) the infrastructure consumption saving gains because of the reduction in the number of cars using the road.

To calculate the change of the cost of the externalities we took modal shift only from cars into consideration with scope of five factors, including the reduced emission of CO_2, local air pollution, noise pollution, accident rate and congestion.

Result & Analysis

Comparaison of change of social welfare between regions

Change in Social Welfare
€ 1.401.959.831
€ 746.375.544
€ 90.791.258
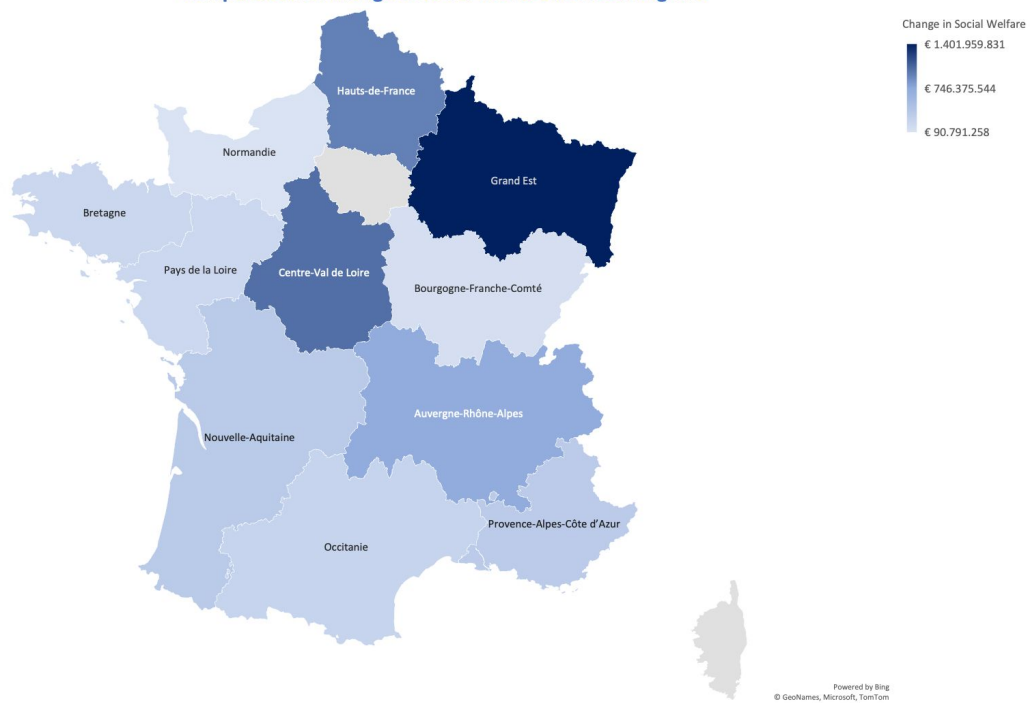
Benefit to Cost Ratio (BCR):

The benefit to cost ratio (BCR) provides an indication of the economic efficiency of the policy implementation.

The BCR values for the regions range from 1.26 to 1.46, suggesting that the policy is expected to generate more benefits than costs in all evaluated regions.