

Assessing the Environmental and Socio-Economic Impacts of Consumer Mobility in Urban Areas

This research presents an analysis of the environmental and socio-economic impacts of consumer mobility and shopping behaviors, drawing from two complementary studies. By examining both individual shopping trips and broader urban transportation patterns, this work aims to shed light on the sustainability of consumer practices and the effectiveness of policy interventions in mitigating negative externalities associated to these practices.

Study 1: Environmental Footprint of Shopping Practices

The first study evaluates the environmental footprint of shopping practices in France by comparing in-store purchases with e-commerce deliveries across different territorial contexts. The shift toward online shopping has led to concerns about its environmental sustainability, particularly regarding last-mile logistics and the proliferation of parcel deliveries. Using a nationwide survey dataset, we estimate purchase frequency by mode and calculate the associated greenhouse gas emissions and pollutant outputs. Our findings indicate that nearly 100 million parcels are delivered monthly in France during peak periods, generating approximately 70,000 tons of CO₂ emissions, equating to a societal cost of 15 million euros per month. We explore various policy scenarios aimed at reducing these externalities, including incentives for consumers to adopt more sustainable purchasing habits. By identifying the conditions under which e-commerce is more or less sustainable than traditional shopping, this study provides a nuanced perspective on the role of digital commerce in urban environmental strategies.

Study 2: Road Traffic and Urban Air Pollution

The second study investigates the relationship between road traffic and urban air pollution in Paris between 2018 and 2024, with a focus on nitrogen dioxide (NO₂) and particulate matter (PM₁₀). Using a dynamic panel data approach with Generalized Method of Moments (GMM), we quantify the causal impact of road traffic on air quality. We exploit exogenous shocks such as Black Friday sales and major transport strikes to identify variations in traffic flow and its subsequent effect on pollution levels. The study further conducts a cost-benefit analysis of transitioning freight transport from internal combustion engine vehicles to electric models and cargo bikes, accounting for the associated reductions in noise pollution, congestion, and health burdens linked to respiratory diseases.

By bridging consumer mobility behaviors with urban environmental challenges, this research contributes to the broader literature on sustainable regional development and aligns with the ERSA Summer School's themes of sustainability, innovation, and regional transformation.