

Extended abstract ERSA

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Without the equations, titles and the references section, the word count is 1,706.

The distance-time-speed trilogy: why such differences between immigrants' and natives' commutes?

1 Introduction

In contemporary developed societies, immigrants account for a considerable share of the population, for example 11.3 % in France (Insee, 2025). Compared with native-born individuals, they experience inequalities across multiple domains, including employment, wages, and housing (Algan et al., 2010; Pan Ké Shon, 2010), and suffer discriminatory treatment from the majority population (Acolin et al., 2016; Bertrand & Mullainathan, 2004). Looking at the integration process is one way to understand the origins of these inequalities and thus design socially just and sustainable policies.

One often overlooked aspect of integration is daily mobility. Yet it is central to assessing territorial accessibility and spatial mismatch, phenomena that have implications in terms of social exclusion (Gobillon et al., 2007; Lucas, 2012). In addition, travel time, especially for commuting, reduces the amount of time available for productive activities, leisure, or consumption. This incurs a cost that contributes to a lowering of individuals' subjective well-being (Chatterjee et al., 2020; Lorenz, 2018).

Given these implications, researchers have focused on the daily mobility of immigrants and noticed transportation behaviors that differ from those of natives. In the United States, for example, immigrants rely more heavily on alternative modes such as carpooling, public transit, walking, and cycling (Blumenberg & Smart, 2010; Chatman & Klein, 2009). Higher levels of alternative-mode use among immigrants have also been observed in Australia, Canada, and France (Gomez, 2024; Heisz & Schellenberg, 2004; Shafi et al., 2020), while in some cities in Germany, Denmark, and Sweden, they cycle less than natives (Haustein et al., 2020; Welsch et al., 2018). Furthermore, the literature highlights a convergence in mobility patterns towards those of natives, known as “travel assimilation” (Blumenberg, 2009; Handy et al., 2008; Shafi et al., 2023), reinforcing the idea that daily mobility forms part of the integration process. Although very informative on transport inequalities, these studies do not permit to understand the reasons for these differences.

In their recent systematic literature review, Delbosc and Shafi (2023) propose a conceptual framework that identifies the probable sources of inequality: reliance on transport habits acquired in the country of origin, cultural differences, socioeconomic characteristics such as gender or income, the built environment, and ethnic enclaves. But which variables most strongly influence the “raw” disparities in daily mobility between natives and immigrants? More specifically, how much do individual attributes, household characteristics, and residential location contribute to these differences? To our knowledge, no study has provided a clear

answer. Casado-Díaz et al. (2022) is a notable exception, making use of decomposition methods. However, their analysis focuses on the unexplained gap and omits crucial variables, like ethnic enclaves, thus failing to provide a satisfactory explanation.

The aim of this article is to estimate the precise role of personal attributes, household characteristics, locational features, travel conditions, and variables capturing these four dimensions in explaining the differences between natives and immigrants in travel distance, time, and average speed for commute trips in France¹. The implications of this research are important, as it provides policymakers with a clear understanding of the mechanisms underlying daily mobility differences between natives and immigrants.

2 Methods and Data

From a methodological perspective, we employ a Oaxaca-Blinder regression decomposition. These methods have been widely used to analyze wage inequalities between natives and immigrants (Aeberhardt et al., 2010; Blinder, 1973; Oaxaca, 1973) and can be applied to other outcomes that exhibit mean differences, like commuting time, as demonstrated by Casado-Díaz et al. (2022). For a variable Y , defined as the logarithm of distance, travel time, or speed, the raw or unadjusted difference between immigrants (B) and natives (A) is simply the difference in expected values (1).

$$\Delta = E(Y_A) - E(Y_B) \quad (1)$$

Now, consider the linear model (2) estimated by ordinary least squares, with $\mathbf{P}$ representing personal attributes, $\mathbf{H}$ household characteristics, $\mathbf{L}$ locational properties, $\mathbf{T}$ travel conditions, and I an indicator for immigrants. For ease of exposition, we rewrite this model in equation 3, where $\mathbf{X}$ represents all explanatory variables.

$$\begin{aligned} Y &= \alpha + \mathbf{P}'\lambda + \mathbf{H}'\delta + \mathbf{L}'\vartheta + \mathbf{T}'\eta + \gamma I + \varepsilon \\ &= \mathbf{X}'\beta + \varepsilon \end{aligned} \quad (2)$$

The raw gap can be decomposed into an explained part, the first component of (3), and an unexplained part, the second component of (3). Here, β_A , β_B , and β^* denotes the coefficients for the native model, the immigrant model, and the pooled model, respectively, while $E(\mathbf{X}_A)$ and $E(\mathbf{X}_B)$ are the average values of observable characteristics.

$$\Delta = [E(\mathbf{X}_A) - E(\mathbf{X}_B)]' \beta^* + [E(\mathbf{X}_A)'(\beta_A - \beta^*) + E(\mathbf{X}_B)'(\beta^* - \beta_B)] \quad (3)$$

The unexplained part equals the coefficient λ in (2), that is, the net difference, or the difference adjusted for control variables. The explained part, Q , reflects the gap attributable to differences in observable characteristics. The contribution of a particular variable or dimension can be calculated following (4). Estimations are performed using robust standard errors clustered at the individual level.

$$Q = [E(\mathbf{X}_A) - E(\mathbf{X}_B)]' \beta^* \equiv [E(\mathbf{P}_A) - E(\mathbf{P}_B)]' \lambda^* + \dots + [E(\mathbf{T}_A) - E(\mathbf{T}_B)]' \eta^* \quad (4)$$

Regarding the data, this study draws on the most recent French National Travel Survey (FNTS hereafter), the *Enquête Mobilité des Personnes*, which is representative of the population living in metropolitan France. Conducted between 2018 and 2019, the survey collected information from 13,000 households, including socio-economic and spatial characteristics as well as trip-specific details such as mode of transport. The FNTS interviews one respondent per household and records trips from a single day randomly selected from the week prior to the interview. We restrict the sample to commuting trips (home-to-work trips), with the trip as the unit of analysis, which enables us to examine mobility disparities beyond the daily level.

¹The analysis of travel speed represents an additional contribution of this study. Speed captures the efficiency or performance of a trip, whereas distance reflects spatial accessibility, and travel time combines both dimensions while also signaling temporal constraints. Despite considerable interest among transport economists (for a discussion of these variables, see Banister, 2011), travel speed has received little attention within literature on immigrants' daily mobility.

3 Results

Firstly, our results show that, on average, immigrants travel more slowly and spend more time commuting than native-born workers, whereas the commute distance appears to be relatively similar. This raw difference in travel time is a phenomenon that has already been observed in research conducted in the United States, Spain, and Germany (Casado-Díaz et al., 2022; Liu, 2009; Preston et al., 1998). Compared to these articles, which are based on daily measurements, we add that the commuting time penalty for immigrants exists in France on a journey basis. In addition, unlike Hu (2017) and Newbold et al. (2017), whose studies focus on the United States, we find no commuting distance penalty for immigrants in France. Finally, the identification of a commuting speed penalty for immigrants constitutes a novel contribution to the literature.

These raw mobility gaps stem from disparities in endowments, particularly in terms of location: adjusting the location characteristics of immigrants to those of natives could reduce immigrants' commuting time by 17.1 %. The most influential variables for the spatial dimension are, in order: the size of the urban area, the level of residential segregation in the neighborhood, the population density of the neighborhood, and public transportation coverage of the municipality. Given the loss of utility associated with increased travel times (Mackie et al., 2001), public authorities should target these variables as a priority to mitigate mobility inequalities between natives and immigrants. Conversely, personal attributes and household characteristics have a negligible effect on mobility gaps.

Travel conditions, most notably the choice of transport mode, also contribute to differences in commuting speed and time, which is consistent with the findings of Casado-Díaz et al. (2022). Through a complementary analysis using a multinomial Logit model, we attribute this effect of transport mode to travel habits acquired in the country of origin, lending support to the hypothesis that past transportation experiences influence current and future travel choices (Smart & Klein, 2018). Beyond disparities in endowments, differences in mobility also stem from unequal sensitivity to the determinants of mobility. For example, a deterioration in health is likely to increase immigrants' commuting time by 32.8 %, but not that of natives. For practitioners, this means that the differences are partly exogenous, and therefore cannot be completely eliminated.

On another note, this study enhances existing knowledge on the immigrant's commuting penalty (Blázquez et al., 2010; George et al., 2025; Preston et al., 1998). Our findings support the view that the commuting penalty originates from residential segregation—that is, the preference for living in ethnic enclaves—rather than from discrimination in housing and labor markets or a greater tolerance for longer travel times. In contrast to Casado-Díaz et al. (2022), the residual gap is not significant, indicating that our model seems more relevant to assessing the sources of mobility inequalities.

Finally, this research advances a broader literature in the economics and sociology of immigration. It demonstrates that daily mobility is a distinct dimension of integration, which interacts with other integration components, particularly the spatial dimension (Fajth & Lessard-Phillips, 2023).

We test the robustness of the results by estimating the model on subgroup of population, such as women or immigrants without the French citizenship. Overall, the contribution of spatial characteristics remains consistent despite the risk of bias due to residential self-selection (Mokhtarian & Cao, 2008). Meanwhile, the raw differences change slightly, correlated with the greater or lesser contribution of travel conditions. This situation is pronounced among women, for whom the impact of transport mode is much greater than among men, reflecting the “greater gender gap” observed for immigrants in terms of transportation behavior (Marcén & Morales, 2021; Matsuo, 2020; Preston et al., 2022).

Alternative specifications, however, yield varying results. On the one hand, the mode of transport is likely to obscure the true influence of socioeconomic and spatial characteristics when included in the estimates, since transport mode itself depends on these factors. When this variable is omitted, an additional “concealed effect” of location of around 3 % appears, indicating that the impact of spatial characteristics is (slightly) underestimated in the baseline equation. On the other hand, the raw differences and contributions of the variables change considerably depending on whether individuals reside in Paris or not. Clearly, there is significant spatial heterogeneity, both in terms of behavior and the distribution of endowments. Additionally, estimates based on the sample of leisure and shopping trips produce results that are very different from those of commuting trips. For future research, we encourage scholars to consider the concealed effect of location, to

distinguish between the purposes of journeys, and to replicate our approach using local surveys to investigate the causes of spatial heterogeneity.

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