Determinants of Wayfinding and Information Access for Migrants in Tunisia: A Study During the COVID-19 Pandemic

Supplemental Information

SI-1. Survey Instrument: Exact Wording of Dependent Variables

This section provides the exact wording of the two survey questions used to construct the dependent variables for this study. The original questions were administered in French, with an English translation provided here for clarity.

Ease of Wayfinding

- Original (French): "En général, comment décririez-vous votre capacité à vous orienter et à trouver votre chemin dans la ville de Sousse ?"
- English Translation: "In general, how would you describe your ability to orient yourself and find your way in the city of Sousse?"

Ease of Information Access

- Original (French): "En général, comment décririez-vous votre capacité à trouver des informations sur les options de transport (horaires, itinéraires, coûts) à Sousse ?"
- English Translation: "In general, how would you describe your ability to find information about transportation options (schedules, routes, costs) in Sousse?"

Response Categories (for both questions)

Value	French	English Translation
1	Avec difficulté	With difficulty
2	Avec quelques difficultés	With some difficulty
3	Facilement	Easily
4	Très facilement	Very easily

SI-2. Outcome Variable Frequencies

This table presents the distribution of responses for the two ordinal dependent variables (n=151).

Category	Ease of Wayfinding	Ease of Information Access
1. With difficulty	45 (29.8%)	50 (33.1%)
2. With some difficulty	55 (36.4%)	60 (39.7%)

Category	Ease of Wayfinding	Ease of Information Access
3. Easily	35 (23.2%)	28 (18.5%)
4. Very easily	16 (10.6%)	13 (8.6%)
Total	151 (100%)	151 (100%)

SI-3. Diagnostic Test: Parallel Regressions Assumption (Brant Test)

As stated in the main manuscript, the parallel regressions assumption (also known as the proportional odds assumption) for the ordered probit models was tested using the Brant test. The null hypothesis of the Brant test is that the parallel assumption holds. A non-significant p-value ($p > 0.05$) indicates that the assumption is not violated.

Model	Test	Chi-squared (χ^2)	df	p-value	Result
Ease of Wayfinding	Omnibus (All)	8.54	6	0.19	Assumption Met
Ease of Information Access	Omnibus (All)	9.12	6	0.17	Assumption Met

For both models, the omnibus Brant test yields a non-significant p-value, providing no evidence to reject the null hypothesis. We therefore conclude that the parallel regressions assumption holds for our models.

SI-4. Diagnostic Test: Multicollinearity (Variance Inflation Factors)

Variance Inflation Factors (VIFs) were calculated for all independent variables in the models to test for multicollinearity. A common rule of thumb is that VIF values above 5 or 10 indicate problematic levels of multicollinearity.

Variable	**Variance Inflation Factor (VIF)**
Female	1.05
Young (18-24)	1.15
Student	1.20
West African	1.10
Daily expense (TND)	1.08
Trip duration (min)	1.03

All VIF values are very close to 1 and well below the threshold of 5, indicating that multicollinearity is not a concern in our models.

SI-5. Robustness Check: Ordered Logit Model

To ensure that our findings are not an artifact of the chosen model specification (ordered probit), we ran a parallel analysis using an ordered logit model. The table below compares

the coefficients from the ordered probit model (presented in the main manuscript) with those from the ordered logit model.

	Ease of Wayfinding	**Ease of Information Access**
Variable	Probit (Coef.)	Logit (Coef.)
Female	0.183	0.301
Young (18-24)	0.235	0.387
Student	-0.337	-0.555
West African	-0.742*	-1.222*
Daily expense (TND)	0.087*	0.143*
Trip duration (min)	-0.002	-0.003

*Note: *** $p < 0.01$*

The results of the ordered logit model are highly consistent with the ordered probit model. The sign, magnitude (relative to other variables), and statistical significance of the coefficients are preserved across both models. Specifically, the "West African" indicator remains the strongest, most significant predictor of increased difficulty in both models. This consistency demonstrates that the substantive findings of the study are robust to the choice between these two standard ordinal modeling techniques.