

VU Research Portal

The cost of travel time variability for air and car travellers

Koster, P.R.

2012

document version

Publisher's PDF, also known as Version of record

[Link to publication in VU Research Portal](#)

citation for published version (APA)

Koster, P. R. (2012). *The cost of travel time variability for air and car travellers*. Tinbergen Institute / Thela Thesis.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal ?

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

E-mail address:

vuresearchportal.ub@vu.nl

Contents

| | |
|--|-----------|
| PREFACE | 1 |
| CHAPTER 1: INTRODUCTION | 5 |
| 1.1 Motivation and relevance for policy | 5 |
| 1.2 The cost of travel time variability | 6 |
| 1.3 Objective and structure of the thesis | 9 |
| 1.4 Contributions to the existing academic literature | 10 |
| CHAPTER 2: TRAVEL TIME VARIABILITY AND AIRPORT ACCESSIBILITY | 13 |
| 2.1 Introduction | 13 |
| 2.2 The scheduling model for air travellers | 15 |
| 2.3 Determinants of the preferred arrival time | 19 |
| 2.3.1 <i>Descriptive statistics of the survey</i> | 19 |
| 2.3.2 <i>Regression analysis</i> | 21 |
| 2.4 Stated choice models | 25 |
| 2.4.1 <i>The choice experiment</i> | 25 |
| 2.4.2 <i>Econometric setup</i> | 28 |
| 2.4.3 <i>Estimation results</i> | 30 |
| 2.5 Empirical illustration | 33 |
| 2.5.1 <i>Introduction</i> | 33 |
| 2.5.2 <i>The evaluation model</i> | 33 |
| 2.5.3 <i>The travel time data</i> | 35 |
| 2.5.4 <i>Empirical results</i> | 37 |
| 2.6 Conclusion and discussion | 37 |
| CHAPTER 3: THE USER COST OF US AIR TRAVEL DELAYS: A SCHEDULING PERSPECTIVE | 43 |
| 3.1 Introduction | 43 |
| 3.2 Behavioural model | 45 |
| 3.3 Data | 50 |
| 3.4 Results | 52 |
| 3.4.1 <i>Analysis for one OD-pair</i> | 52 |
| 3.4.2 <i>Analysis for the full dataset</i> | 56 |
| 3.4.3 <i>Discussion of the assumptions</i> | 62 |
| 3.4.3.1 <i>Assumption on equality of prices over time of the day</i> | 62 |
| 3.4.3.2 <i>Non-linear scheduling cost function</i> | 62 |
| 3.4.3.3 <i>Distribution of preferred arrival times</i> | 63 |
| 3.4.3.4 <i>Values of schedule delays and proportional heterogeneity in preferences</i> | 63 |

| | |
|---|------------|
| 3.5 Final comments and discussion | 64 |
| Appendix 3A Derivation of deterministic scheduling cost | 66 |
| 3A.1 <i>Uniform pat distribution</i> | 66 |
| 3A.2 <i>Other pat distributions</i> | 67 |
| Appendix 3B The value of improvements in mean arrival delay | 68 |
| Appendix 3C Results of the sensitivity analysis | 70 |
| CHAPTER 4: A RANK DEPENDENT SCHEDULING MODEL | 75 |
| 4.1 Introduction | 75 |
| 4.2 Literature | 76 |
| 4.3 Rank dependent utility | 79 |
| 4.4 Optimal choice of departure time | 83 |
| 4.4.1 <i>Ranking of the outcomes</i> | 83 |
| 4.4.2 <i>Optimal choice of headstart</i> | 84 |
| 4.4.3 <i>Extension to a model with a time-of-day dependent travel time distribution</i> | 87 |
| 4.5 Empirical application | 88 |
| 4.6 Conclusions | 94 |
| CHAPTER 5: ANALYSING OBSERVED PREFERENCE HETEROGENEITY IN CHOICE EXPERIMENTS: A LOCAL LIKELIHOOD ESTIMATION APPROACH | 95 |
| 5.1 Introduction | 95 |
| 5.2 Econometric setup | 99 |
| 5.2.1 <i>Introduction</i> | 99 |
| 5.2.2 <i>Local Logit estimation</i> | 100 |
| 5.2.3 <i>Kernel functions</i> | 102 |
| 5.2.4 <i>Model and bandwidth selection</i> | 104 |
| 5.3 Experimental setup and data | 105 |
| 5.3.1 <i>Setup of the choice experiment</i> | 105 |
| 5.3.2 <i>Utility specification at the local level</i> | 107 |
| 5.4 Estimation results | 109 |
| 5.4.1 <i>Baseline results</i> | 109 |
| 5.4.2 <i>Univariate kernel weights</i> | 111 |
| 5.4.3 <i>Multivariate kernel weights</i> | 112 |
| 5.4.4 <i>Sensitivity analysis for multivariate kernel weights</i> | 115 |
| 5.5 Conclusions | 115 |
| Appendix 5A Derivation of the hat matrix for the binary logit model | 116 |
| Appendix 5B Descriptive statistics and sensitivity analysis | 118 |
| CHAPTER 6: CONCLUSION | 121 |
| REFERENCE LIST | 129 |
| SUMMARY (in Dutch) | 142 |