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Leisure and work time for the stressed Santiaguinos using OD survey data.

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Santiago de Chile is a city with six million inhabitants described in the recent past as having the most peculiar records: second only to Mexico City as the most polluted in the world, or the capital city with the largest working periods. Using a relatively small but detailed sample of workers in a corridor of Santiago, Jara-Díaz et al (2007) were able to estimate their values of work and leisure using the novel microeconomic framework proposed by Jara-Díaz and Guerra (2003) and the econometric tools developed by Munizaga et al (2008). They found negative values of work that represent a large proportion of the wage rate, much larger than those estimated with the same approach for workers in the Swiss canton Thurgau and the German city of Karlsruhe. As this was a comparison involving a small part of the population in Santiago, we decided to explore the perception of work and leisure time of the Santiaguinos as a whole. Although the primary difficulty was the unavailability of data on time use, we observed that the very rich Santiago Origin Destination (OD) survey (Ortúzar et al, 2003) could be transformed into somewhat aggregated individual time assignment information by converting trip data into activities duration using trip purpose and the information on the beginning and ending trip times.

The Santiago 2001 OD survey has more than 12,000 households sampled randomly from the population of Santiago, each observed during a whole day only but covering the whole week. We analyzed the available information and selected those individuals that work during the normal season, obtaining a sample of 16887 workers (11863 for a weekday, 2306 for Saturday and 2718 for Sunday). Then we identified possible ways to build adequate descriptions of the individuals' time assignment to different activities. Also, we analyzed the socio-demographic characteristics of the sample, which could be used as

segmentation variables and to link observations. As we require complete time use information within a whole work-leisure cycle period and travel data, we selected and applied a novel method to build weekly observations from the single day data. The objective of this work was to obtain from the OD survey, a database qualitatively similar to a much smaller one previously obtained specifically with the purpose of calibrating the time use - mode choice model system.

Following the analysis of the available information we checked that travel information can be transformed to activity information and described the time assignment in two ways: average time assignment and activity patterns. This description showed that working days are very similar, so they can be grouped together in a working day category.

As each individual was observed only during one day, the activity patterns of the different days of the week come from different individuals. Although, we can make comparisons among types of day (Working day, Saturday and Sunday), we needed to build weekly observations to be able to calibrate the model. We explored the possibility of finding twins to aggregate the information of individuals observed in different types of day to a single weekly observation. In order to do this we took each individual observed during a working day, assumed the same behavior for all the five weekdays, and looked into the Saturday and Sunday databases for information that could be used to complete the puzzle.

The data fusion procedure applied was based on generating the missing information using a convex combination of the data from individuals that are observed in the missing day (Saturday or Sunday) and have similar socioeconomic characteristics to the reference individual. The socioeconomic characteristics used to match individuals are: sex, age, location, education, link with the house head, number of vehicles, income, driving license, internet and cable TV possession. The number of weekend individuals necessary to create a twin vary from 1 to 10 (3 in average), in the 17% of the cases only one weekend individual is needed and almost all the weekend individuals are used al least once.

Preliminary applications show that this imputation method generates reasonable data and yields interesting results. The activity patterns show that there are differences by age, sex and location (somewhat related with income). Applying the model system to these data suggests different valuations of work and leisure among groups that are worth discussing further.

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