COMMUTING ZONES IN MEXICO

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A local labor market is defined by a commuting zone: an area within which most of the people live and work. We start by using 59 metropolitan statistical areas defined by the Mexican Statistics Agency (INEGI). Each area consists of a group of municipalities that exhibit a high degree of socioeconomic interaction. The 59 zones do not cover the entire country, however. Therefore, we create additional commuting zones using procedures and criteria similar to those used by Mexican Census Bureau based on census tract information. These criteria include interactions that reflect commuting between the residence and the workplace.

The algorithm to construct commuting zones is as follows. First, we identified central localities. We considered a municipality to be central if it attracts population from other municipalities for employment purposes. These are places where economic activity tends to be concentrated. To identify them in the data we created an index of urbanity at the municipality level which is the sum of the following standardized variables: municipality population, percent of urban population, urban density, percent of population working in non-primary activities, and number of municipalities from where people come to work. We classified a municipality as central if the municipality has an urban index score above the 25th percentile. The process identifies 599 central municipalities. We considered the rest of the municipalities to be peripheral.

Second, we assigned a peripheral municipality to a central municipality in multiple rounds, as follows. In round one, we found peripheral municipalities that satisfied three criteria: (i) its centroid is less than 100 kilometers from the centroid of a central municiaplity;[1] (ii) at least one person from the peripheral municipality worked in the central municipality; and (iii) there was a positive correlation in the urban employment rates between their census

[1]Two municipalities were too large so that they did not have a neighbor municipality near below the 100km threshold. We treated these municipalities as independent commuting zone.

tracts.[2,3] At the end of this an initial set of peripheral municipalities were adjoined to a central municipality.

Third, we repeated this procedure adding peripheral municipalities until no more municipalities could be assigned. After seven rounds, this procedure assigned 1068 municipalities to central municipality (73% of the municipalities in Mexico). Finally, to assign the residual municipalities we continued the process of assignment by lifting criteria (iii). After five new rounds 291 more municipalities were assigned. In the end, there was a small residual of municipalities that were not assigned with this process. These were very rural[4] and small[5] so we treated them as independent commuting zones. All in all, the algorithm assigned the whole universe of Mexican municipalities to 780 commuting zones or local labor markets.

[2]We created the following measure of employment correlation between municipalities M and N: $\alpha_{M,N} = L'PW_L/L'PL$, where: L_{mx1} is the vector of employment rate for municipality M census tracts. This measure is standardized by the state average and standard deviation. W_{mxn} is a weighting matrix for each municipality M and N's census tracts, defined as the inverse of the distance of each census tract. The sum of all the values in each row is standardized to equal be to one. $W_L = W * L^n$ is the vector of the weighted average employment rate of municipality N's census tract. P is a diagonal matrix that weights the census tract of municipality M by the population share of each municipality M.

[3]If one municipality was a neighbor of two or more central municipalities we created and index that took into account the three criteria of assignment described above. We assigned the peripheral municipality to a the central municipality with the greatest index value.

[4]On average 72% of population in these municipalities work on primary activities, the urban area is less than 19% and most of them (77) are located in Oaxaca.

[5]The population of these municipalities is always lower than 19,000 inhabitants.