Exercise 3

Multipliers are used to estimate the relative proportion of local and export jobs in a region’s economy. The multiplier is used to estimate the number of local jobs relative to the number of export jobs. It is calculated by first obtaining \( \alpha = \frac{E_L}{E_T} \), the ratio of local to total jobs for all industries that employ workers proving a surplus workforce to support only the local economy (that is, industries with a positive location quotient). Alpha can be estimated by using either local or export employment, as the identity \( E_T = E_x + E_L \) gives an explicit relationship between total, export, and local employment. The multiplier, \( M \), is then obtained by using the identity \( M = \left( \frac{1}{1 - \alpha} \right) \).

The data source I used came from the US Bureau of Economic Analysis (NAICS, Series CA25N for King County, Washington State, and the entire US). I filtered the data in order not to use subtotals, thus the industries selected were: Farm employment, Forestry, fishing, related activities, Mining, Utilities, Construction Manufacturing, Wholesale trade, Retail trade, Transportation and warehousing, Information, Finance and insurance, Real estate and rental and leasing, Professional and technical services, Management of companies and enterprises, Administrative and waste services, Educational services, Health care and social assistance, Arts, entertainment, and recreation, Accommodation and food services, Other services, Federal, civilian, Military, State government, and Local government.
I calculated the multiplier for King County in 2001 by using two different benchmark regions: the entire US and the state of Washington. The multipliers were 1.4 and 2.4, respectively. This means that for every 100 export jobs in King County there are 140 local jobs in comparison to the entire US economy. Likewise, in comparison to the Washington State economy, for every 100 export jobs there are 240 local jobs. Compared to the Washington economy, the multipliers for Ferry and Wahkiakum Counties are 2.6 and 1.3, respectively. This shows that Ferry County ranks close to King in proportion of export jobs whereas Wahkiakum employs relatively fewer workers in export industries.

There are a few problems with using this method for generating estimators of local and export employment, some of which described below:

- Industry codes for the CA25N series are quite aggregated. Using more detailed industry codes would provide more realistic estimates. That is, regions may differ substantially in individual industries, but when industries are aggregated into sectors, some of those differences may disappear. Using more detailed industry breakdowns would result in more realistic comparisons.

- The calculations assume no exports for the benchmark region. If the benchmark region has substantial exports, the benchmark region’s consumption would be underestimated, leading to an underestimation of the region’s export employment. A scaling factor could be applied to the benchmark’s employment in order to make a more realistic comparison between the actual export jobs in the local region versus the benchmark. This scaling factor could be obtained by using a similar base multiplier analysis in comparison to a larger benchmark (say, compare Washington State to the entire US).
• Productivity per worker may differ between the local region and the benchmark. For any industry, assume an equal proportion of workers in the local and benchmark regions. If local workers are more productive, the actual amount of export activity would be higher than estimated. I do not know how King County compares to the rest of the State, but having traveled to various places within the US and abroad, I can say that worker productivity varies widely!

• The model assumes identical preferences for the region and the benchmark. If local tastes or spending patterns differ from the benchmark, the comparisons could be either overestimated or underestimated. While this is certainly the case (Seattle, which dominates the County economy, has major cultural and artistic sectors, unlike most of the rest of the State). This problem would be more difficult to handle without making some kind of survey of the State to correct for the amount of activity in each industry that is actually used locally rather than exported.