MIAMI VALLEY
Regional Planning Commission
Shaping Our Region's Future Together

MIAMI VALLEY ECONOMIC BASE ASSESSMENT

Computation Methodology

Location Quotient Analysis

The Location Quotient (LQ) analysis compares the local area economy to the reference area economy to measure relative concentration of each industry sector in the local area economy in comparison to the larger reference area. The result illustrates whether each industry sector in the local area is more/less concentrated than the reference area. Using the industry sector employment figure as an economic indicator, the LQ is calculated as following.

Location Quotient (LQ) = $(e_i/e_t) / (E_i/E_t)$

Where e_i = local area employment in industry i,
e_t = total local area employment,
E_i = reference area employment in industry i, and
E_t = total reference area employment.

- LQ Greater than 1: The employment in that industry sector is more concentrated than the reference area.
- LQ Less than or Equal to 1: The employment in that industry sector is less concentrated than the reference area.

Example: In 2016, the City of Miami Valley has a total of 8,000 employees as a whole, of which 1,000 are in the service sector. The Region where the city is located, however, has a total of 80,000 employees and 12,000 are in the service sector.

In this example, the Location Quotient of the service sector for the City of Miami Valley, in reference to the Region, is 0.83.

LQ = (1,000/8,000) / (12,000/80,000)

Where 1,000 = e_i (service industry employment in the City of Miami Valley),
8,500 = e_t (total employment in the City of Miami Valley),
12,000 = E_i (service industry employment in the Region), and
80,000 = E_t (total employment in the Region).

Shift-Share Analysis

The Shift-Share analysis measures changes that have taken place over time in the local area economy in relation to the reference area economy. Each industry sector's growth/decline is separated and explained by 3 components: Reference Area Growth Effect, Industry Mix Effect, and Regional Shift Effect. Using the industry sector employment figure as an economic indicator, each component in the Shift-Share analysis represents the following and is calculated as illustrated below.

- **Reference Area Growth Effect**: The growth or decline in employment that could be attributed to the overall growth/decline of the reference area.

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- **Industry Mix Effect**: The additional gain (or loss) in employment that could be attributed to the specific industry sector growing faster (or slower) than the rate of all industries combined in the reference area.
- **Regional Shift Effect:** The additional gain (or loss) in employment for a specific industry beyond the Reference Area Growth Effect and Industry Mix Effect resulting from the industry growing faster (or slower) in the Region.

	Reference Area Growth Effect		**Industry Mix Effect**		**Regional Shift Effect**
$\Delta e_i =$	$e_i [(RA^*/RA) - 1]$	+	$e_i [(RA_i^*/RA_i) - (RA^*/RA)]$	+	$e_i [(e_i^*/e_i) - (RA_i^*/RA_i)]$

Where Δe_i = the change in local area employment in industry i,
e_i = local area employment in industry i at the beginning of the period,
e_i^* = local area employment in industry i at the end of the period,
RA_i = reference area employment in industry i at the beginning of the period,
RA_i^* = reference area employment in industry i at the end of the period,
RA = total reference area employment at the beginning of the period, and
RA* = total reference area employment at the end of the period.

Example: Between 2001 and 2016, the City of Miami Valley experienced an increase of 360 employees in the service sector industry from 640 employees in 2001 to 1,000 employees in 2016. Over the same period, the Region's total employment grew from 72,000 to 80,000 employees and in the service sector, the employment grew from 10,500 in 2001 to 12,000 in 2016.

In this example, the 360 employee increase for the City of Miami Valley can be explained as following.

360 = **71** (Reference Area Growth Effect) + **20** (Industry Mix Effect) + **269** (Regional Shift Effect)

This was calculated by:

360 = 640 [(8,000/7,200) – 1] + 640 [(12,000/10,500) – (8,000/7,200)] + 640 [(1,000/640) – (12,000/10500)]

Where 360 = Δe_i (City of Miami Valley service sector employment change),
640 = e_i (2001 service sector employment in the City of Miami Valley),
1,000 = e_i^* (2016 service sector employment in the City of Miami Valley),
10,500 = RA_i (2001 service sector employment in the Region),
12,000 = RA_i^* (2016 service sector employment in the Region),
72,000 = RA (2001 total employment in the Region), and
80,000 = RA^* (2016 total employment in the Region).