

Technical Notes: Nested Shift-Share Analysis (SSA) Methodology

A Force for Growth

This analysis decomposes local economic growth, as measured by change in real Gross Value Added (GVA) over the period 2010 to 2022, into components attributable to national, regional, industrial, and local factors using a nested shift-share analysis. This approach enables clearer estimation of the economic contribution and constraints associated with place-specific factors, which could plausibly be within the scope of local authority influence. For instance through local transport, public health or regeneration plans.

Data used for this model:

- ONS Real Gross Value Added (GVA) by sector¹, for:
 - Local authority level (e.g., districts/unitaries)
 - Regional level (e.g., ITL1)
 - National level
- Sector classification: consistent across all geographic levels (e.g., SIC07).
- Base year of analysis: 2010
- End year for comparison: 2022.

Model Structure: Total observed GVA growth for a sector in a local authority is decomposed as follows:

$$\text{GVA_Growth}_{\text{Local}} = \text{NE} + \text{IME} + \text{RCE} + \text{LCE}$$

Where:

- **NE (National Effect):** Growth that would have occurred if each local sector grew at the national average rate for that sector.
- **IME (Industry Mix Effect):** Additional growth due to local specialisation in nationally fast- or slow-growing sectors.
- **RCE (Regional Competitive Effect):** Deviation of regional sector growth (ITL1) from national sector growth.
- **LCE (Local Competitive Effect):** Residual local growth not explained by broader geographic trends.

Each effect is calculated sector-by-sector and summed for each local authority.

¹ ONS (2025) 'Regional gross value added (balanced) by industry: local authorities by ITL1 region'. Available at : <https://www.ons.gov.uk/economy/grossdomesticproductgdp/datasets/regionalgrossvalueaddedbalancedbyindustrylocalauthoritiesbyitl1region>

Component Calculations (Per Sector i in Place j):

Let:

- $GVA_{i,j}^{t_0}$ = base year GVA for sector i in place j
- $g_{nat,i}$ = national growth rate for sector i
- $g_{reg,i,r}$ = ITL1 regional growth rate for sector i in region r
- $g_{loc,i,j}$ = observed local growth rate for sector i in place j

Then:

1. $NE_{i,j} = GVA_{i,j}^{t_0} \times g_{nat,i}$
2. $IME_{i,j} = GVA_{i,j}^{t_0} \times (g_{nat,i} - g_{nat,avg})$
3. $RCE_{i,j} = GVA_{i,j}^{t_0} \times (g_{reg,i,r} - g_{nat,i})$
4. $LCE_{i,j} = GVA_{i,j}^{t_0} \times (g_{loc,i,j} - g_{reg,i,r})$

Sum across all sectors i to get total NE, IME, RCE, and LCE for place j .

Assumptions:

- Additive decomposition is valid and meaningful.
- Spatial spillovers are partially captured via the regional competitive effect.
- GVA data are accurate and comparable across spatial scales.

How to calculate lost economic potential:

1. Sum the negative values of LCE across sectors for each place j .
2. Take the absolute value of this number.
3. Multiply by the inflation multiplier, 1.27725, to get 2025 prices.