



Exercise

Building Data Envelopment Analysis Models to Solve an Operations Problem

An insurance company has local offices that are spread throughout the country. The offices service middle-market (mid-sized companies) accounts. When analyzing employee ages, you noticed that a large number of employees in these local offices are approaching retirement age. You presented this information to your senior leadership. In response, they asked you to determine whether the company should hire replacements for those that retire, or use the natural attrition as a means of becoming more efficient.

Two regional offices cover each region, so there are a total of twelve offices. An office has account managers (AM) and account executives (AE) who service new and current policies. In addition, the regional offices also handle policy modifications.

- If not already opened, open **ch2ex.sas** and run the code that generates an insurance operations data set. Next, run the code under the commented line that begins with “5a.” The OPTMODEL code is evaluating the South East1 region using an input-oriented DEA model. Is the South East 1 region operating efficiently? If the answer is no, by what percentage can this office reduce staff?
- Copy and paste the 5a code and modify the code to assess the South West 1 region. Is the South West 1 region operating efficiently according to the input-oriented DEA model?
- Copy and paste the OPTMODEL code and modify the model so that you are now using an output-oriented DEA model to assess offices. Using the output-oriented DEA model, assess the office labeled Mid-West2. Is Mid-West2 operating efficiently according to the output-oriented model? If the answer is no, by what percentage can this office increase production?

Data Set View:

| <i>Office</i> | <i>AEs</i> | <i>AMs</i> | <i>New_Policies</i> | <i>Old_Policies</i> | <i>Modified_Policies</i> |
|--------------------|------------|------------|---------------------|---------------------|--------------------------|
| <i>South_East1</i> | 4 | 15 | 32 | 51 | 31 |
| <i>South_East2</i> | 5 | 7 | 25 | 77 | 21 |
| <i>South_West1</i> | 4 | 4 | 33 | 98 | 24 |
| <i>South_West2</i> | 2 | 10 | 34 | 58 | 21 |
| <i>North_East1</i> | 3 | 10 | 28 | 53 | 22 |
| <i>North_East2</i> | 1 | 4 | 27 | 71 | 45 |
| <i>North_West1</i> | 2 | 4 | 34 | 78 | 30 |
| <i>North_West2</i> | 2 | 4 | 25 | 91 | 37 |
| <i>Mid_East1</i> | 3 | 3 | 14 | 75 | 24 |
| <i>Mid_East2</i> | 1 | 11 | 22 | 94 | 36 |
| <i>Mid_West1</i> | 4 | 12 | 19 | 90 | 36 |
| <i>Mid_West2</i> | 3 | 8 | 20 | 91 | 43 |