

## **ABSTRACT**

The integer radial data envelopment analysis (IDEA) approach has been introduced by numerous efficiency studies to accurately measure various real life applications where some of their inputs and/or outputs are restricted to integer values. However, all these studies have not addressed the nature of return to scale (RTS) in terms of an output integer-valued DEA model. This paper thus discusses the RTS for an output oriented integer-valued DEA model to identify its regions (increasing, decreasing, and constant). These regions are identified by classifying the efficiency scores resulting from the output-oriented integer-valued DEA model under constant return to scale (CRS) and variable return to scale (VRS) as well as the intensity factors' values corresponding to the model under CRS. As an illustration purpose, the output oriented integer-valued DEA model under the two technologies was applied to the empirical data of public universities in Malaysia. The results showed that only half (50%) and slightly over half (55%) of the universities were efficient under CRS and VRS, respectively. In spite of this fact, some of the inefficient universities have a room for efficiency improvement by decreasing their inputs and increasing their outputs. In addition, the calculated scale efficiency and regions of the RTS showed that 50% of the universities were operating in the region of CRS, and each 25% of them were operating in increasing and decreasing RTS.