



UNIVERSITY OF MINNESOTA

Department of  
**APPLIED  
ECONOMICS**

# Agricultural and Applied Economics Seminar

## Integrating Efficiency Concepts in Technology Approximation: A Weighted DEA Approach

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**12:00 – 1:30 pm**

**119 Ruttan Hall**

A method is developed to integrate the concepts of technical, scale, and allocative inefficiencies (TI, SI, and AI) into a frontier approximation under Data Envelopment Analysis (DEA). The proposed weighted DEA (WDEA) approach employs a weighted average of the three benchmarking frontiers associated with the three efficiency concepts, extending the conventional frontier approximation under variable returns to scale (VRS) toward scale- and allocatively-efficient decisions. A weight selection rule is devised based on a finite-sample bias correction technique and sample correlations between the underestimation of TI and the overestimation of SI and AI under conventional measures. The WDEA approach is consistent and more efficient than the VRS model under the maintained properties of data generating process. An application to U.S. dairy production data finds that on average TI is 13 to 21 percentage-points higher under WDEA than under VRS, depending on the geographic region.