Good Neighbor or Bad Neighbor: Assessing the Impact of Concentrated Animal Feed Operations on Local Economies

Over recent decades, Concentrated Animal Feed Operations (CAFOs) have become the predominant method of meat production in the U.S. and various other countries. The substantial amount of manure produced by CAFOs poses environmental and public health concerns, as evident in agricultural economics literature highlighting its impact on deteriorating water quality (Raff and Meyer, 2022) and adversely affecting nearby property values (Ready and Abdalla, 2005). These findings underscore the negative influence of CAFOs on local amenities and regional economic development.

While CAFOs raise environmental concerns, they play a crucial role in providing affordable animal products to support food manufacturing. Industry clusters centered around CAFOs have the potential to boost economic development significantly. According to the National Industry-Specific Employment and Wage Estimates (OEWS) from the Bureau of Labor Statistics (BLS), Animal Slaughtering and Processing and Dairy Product Manufacturing generated 520,970 and 157,140 U.S. jobs in 2022, respectively. Despite predominantly offering low- and medium-salary jobs, these employment opportunities are concentrated in sparsely populated rural areas, rendering them especially meaningful.

Beyond the direct creation of jobs, employment generated by CAFOs has a multiplier effect, stimulating the creation of additional related positions. Based on our estimates using OEWS data, one frontline worker in meat processing corresponds to more than 2.5 other jobs, spanning not only low- and medium-salary manufacturing or transportation roles but also higher-paying positions in management and engineering. A similar multiplier effect was observed in dairy manufacturing, exceeding 3.5. These locally created jobs contribute significantly to the boost in the local economy.

Our empirical analysis aims to distinguish between two channels of the impact of CAFOs on the local economy: the well-studied environmental impact and the less-explored local employment and clustering impact. Focusing on the state of Wisconsin, with its detailed dataset and the scale of its dairy industry, makes it uniquely suited for this analysis. We categorize zip codes into three groups: 1) Zip codes with both CAFOs and downstream manufacturing clusters (the 1st treatment arm); 2) Zip codes with only CAFOs but no downstream clusters (the 2nd treatment arm); 3) the rest (the control group). The differences between the latter two groups indicate the impact of having CAFOs present, while the differences between the former two groups indicate the impact of CAFOs through creating industry clusters.

Our findings reveal significant differences based on the presence of clusters. For

zip codes with only CAFOs but no downstream clusters, housing values are significantly lower than those in the control group. Employment opportunities in manufacturing, construction, retail, and public services are also statistically lower. These zip codes exhibit lower population and a higher proportion of low-income residents. Regarding zip codes with both CAFOs and downstream clusters, the marginal effect of having CAFOs is positive for real estate prices and employment opportunities in downstream sectors but not in other sectors. It also correlates with a higher number of population and high-income residents (earning more than $75,000 annually).

We then conduct a parcel-level analysis to explore the causal effect of CAFOs on property values in detail. First, we compare parcels located within 10 km of CAFOs to others between 10 and 20 km. We find that CAFOs significantly increase the values of agricultural and commercial land but decrease residential land values. The presence of CAFOs alone decreases land value. Secondly, we utilize variations in wind direction to refine our analysis, confirming that having CAFOs can increase commercial land value but decrease residential land value. The presence of CAFOs alone, without an industry cluster, has a negative effect on land value.

This paper makes several contributions to existing literature. Firstly, it contributes to the literature studying the agglomeration effect of industry policies and the natural resource curse. Unlike recent literature primarily focusing on natural resources such as oil (more recently hydraulic fracturing), mining, etc., we concentrate on the livestock industry, a manmade resource curse. The unique structure of CAFOs and their downstream clusters provides opportunities to study industry policies. Secondly, current literature related to CAFOs mainly concerns their environmental impact, such as water and air pollutions. However, there are very limited studies focusing on the socioeconomic impact of CAFOs, which is the void this study aims to fill. We also provide evidence on the heterogeneous outcomes resulting from different strategies.

References

[1] Raff, Zach, and Andrew Meyer. "CAFOs and surface water quality: Evidence from Wisconsin." *American Journal of Agricultural Economics* 104, no. 1 (2022): 161-189.

[2] Ready, Richard C., and Charles W. Abdalla. "The amenity and disamenity impacts of agriculture: estimates from a hedonic pricing model." *American Journal of Agricultural Economics* 87, no. 2 (2005): 314-326.