The Role of Pig Diseases in Structural Change in the Canadian Pig Industry

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MOTIVATION

- Over the last two decades, the Canadian pig industry has undergone dramatic structural change with a huge decrease in the number of pig farms (70%) and an increase in pig numbers (3-fold) (Statistics Canada, 2017) (Figure 1).
- However, not every census division across Canada experienced the same structural changes.
- From 1996 to 2011, about 56% of the census divisions in Canada went through both pig farm losses and total pig number reductions, 44% had pig farm losses and pig number increases (Statistics Canada, 1997; Statistics Canada, 2014) (Figure 2).
- Therefore, any one-size-fits-all policy resulting from economic analyses conducted at a national level might not benefit farm operators in some regions at all.
- Among the studies examining how the livestock industry has evolved and the forces behind the sector’s structural change, few studies have looked at the role of animal disease(s) in an industry’s transition.
  - Such analyses could be essential as global epidemics (such as PRRS and PCVAD in pigs) appear to be increasing.
  - From an economic point of view, disease outbreaks
    - caused net losses for farmers by reducing the number of marketable pigs (McInerney et al., 1992)
    - shrank profit margins by increasing the costs of disease control and prevention strategies (Office of Audit and Evaluation, 2015).

DATA

Data by census divisions for all provinces in Canada from 1996 to 2011 are used in this study.
- Census data on farm operations as well as other farm and farmer characteristics (Statistics Canada).
- Economic variables such as input and output prices (deflated to real levels) (Agriculture and Agri-Food Canada).
- Timelines regarding the important events such as COOL implementation that have affected the Canadian pig industry (government reports).
- Impact of pig disease on farm structures is captured by a time dummy indicating the dramatic increases in pig diseases cases (PRRS: 2002-2005; PCVAD: 2004-2006).
  - The reason that we suddenly had such frequent and severe problems during these periods is that we were dealing with new and more virulent isolates of the viruses.
- PRRS-Porcine reproductive and respiratory syndrome virus
- PCVAD-Porcine circovirus associated disease

OBJECTIVE

- Assess how pig diseases (PRRS and PCVAD) have affected structural change in the Canadian pig industry at the individual census district level while controlling for the effect of other key economic explanatory variables over the period 1996 to 2011 (Figure 3).
- Other economic pressures:
  - Implementation of country-of-origin-labeling (COOL) in the U.S.
  - Price variations, etc.
- Investigate the effects of neighborhood, farm and farmer characteristics on the change in farm structures.

RESULTS

- Price-feed ratio has larger impacts on the size of the farms located in the CDs that experienced pig number increases.
- CDs that experienced pig number increases are dominated by large farms, which used more purchased feed and less homegrown feed as compared to smaller farms.
- Inputs account for a higher share of larger farm costs.
- Older farmers in QC are less likely to expand their operations.
- Pig diseases have played a more significant role in the divisions experienced total pig number reductions.

CONCLUSION

- Pig disease(s) did affect the Canadian pig industry’s structural change.
- Heterogeneity in structural change across different regions does exist.
- Pig disease has played a more significant role in the regions that experienced pig farm losses and pig number declines.
- Further research should focus on
  - Explaining why farmers make different farm structure adjustments in reaction to disease outbreaks
  - Investigating how changes in production types have contributed to a role in the industry’s transition
  - Due to disease outbreaks, some pig farmers have moved away from traditional farrow-to-finish operations to single phase production.

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