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Climate Change and the U.S. Livestock Market

Elham Darbandi

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Climate Change and the U.S livestock Market

Assessing the influence of livestock

Presented by: Elham Darbandi

PhD Student

Dept. of Agricultural Economics

University of Kentucky

Outlines

- o Motivation
- o Literature Review
- o Data & Methodology
- o Limitations
- o Results & Discussion
- o Conclusion

Motivation: Why Livestock Market?

- o The livestock sector is a primary emitter of Greenhouse gas and its contribution to climate change is growing as global demand for animal products rises.
- o Greenhouse gas emissions from the livestock sector are estimated to account for 14.5 percent of the global total, more than direct emissions from the transport sector.

Why is it important?

- Livestock production is also an important driver of deforestation and associated carbon dioxide (CO₂) emissions – both **directly**, as forests are cut down to provide pasture or are degraded through animal grazing, and **indirectly**, as rising demand for animal feed drives the expansion of cropland into forests

- o Even with ambitious supply-side action to reduce the emissions intensity of livestock production, **rising global demand** for meat and dairy means **emissions will continue to rise.**

What is the solution?

- o Recent analyses have shown that it is unlikely global temperature rises can be kept below two degrees Celsius without a shift in global meat and dairy consumption.
- o A number of factors have made governments and environmental groups reluctant to pursue policies or campaigns to shift consumer behavior.

Literature Review

- In spite of the remarkable emission from the livestock product, there is little policy attention at either the international or national level.
- The lack of attention afforded to the issue among policy-makers and opinion-formers contributes to a lack of research on how best to reduce meat and dairy consumption.

Forgotten Sector

- o Bailey *et al.* (2014)
- o Livestock – Climate Change’s Forgotten Sector
- o Compared with other sectors, recognition of the livestock sector as a significant contributor to climate change is markedly low.
- o Consumers with a higher level of awareness were more likely to indicate willingness to reduce their meat and dairy consumption for climate objectives.

The U.S Beef Sector

- o Beef and dairy are the most emissions-intensive livestock products and are responsible for the most emissions, accounting for 65 per cent of the total GHGs emitted by livestock.
- o Average global estimates suggest that, per unit of protein, **GHG emissions from beef production are around 150 times those of soy products**, by volume, and even the least emissions-intensive meat products – pork and chicken – produce 20–25 times more GHGs

Research Question

- Testing the hypothesis that:
- Shifting global demand for meat and dairy produce is essential to achieving climate goals

Data

- o World Bank
- o USDA- ERS

Methodology

- VAR models are often used to analyze certain aspects of the relationships between the variables of interest. Because they represent the correlations among a set of variables.
- Impulse Response Function (IRF)
- Generally, an **impulse response** is the reaction of any dynamic system in **response** to some external change.

Impulse Response Function

- The response of variable i to a unit shock (forecast error) in variable j is sometimes depicted graphically to get a visual impression of the dynamic interrelationships within the system.

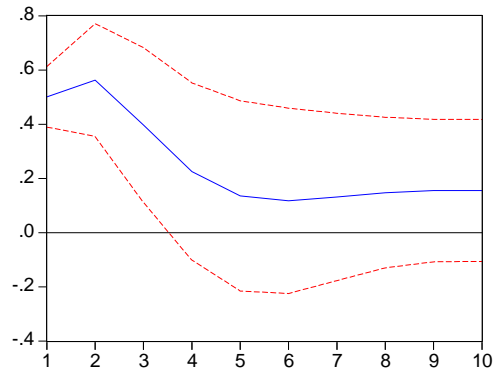
Limitations of moded

- o All effects of omitted variables are assumed to be in the innovations.
- o If important variables are omitted from the system, this may lead to major distortions in the impulse responses and makes them worthless for structural interpretations.

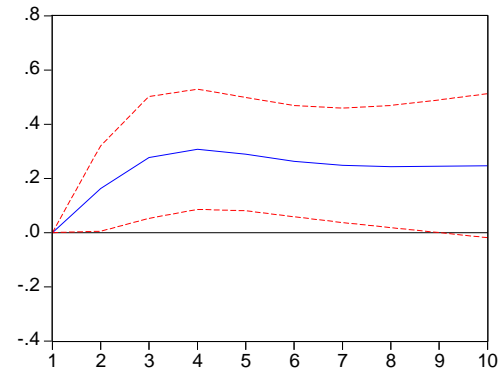
Results

Response to Cholesky One S.D. Innovations ± 2 S.E.

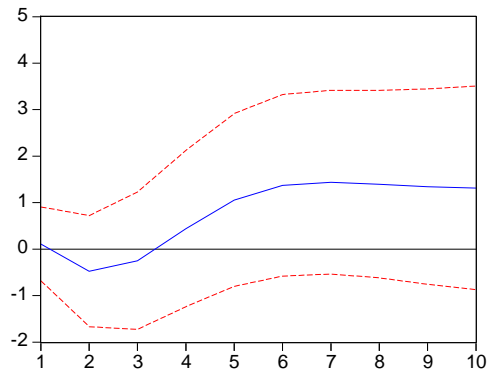
Response of CO2 to CO2



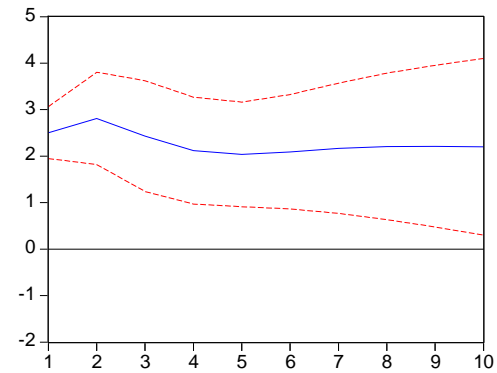
Response of CO2 to BEEFCONSUMPTION



Response of BEEFCONSUMPTION to CO2

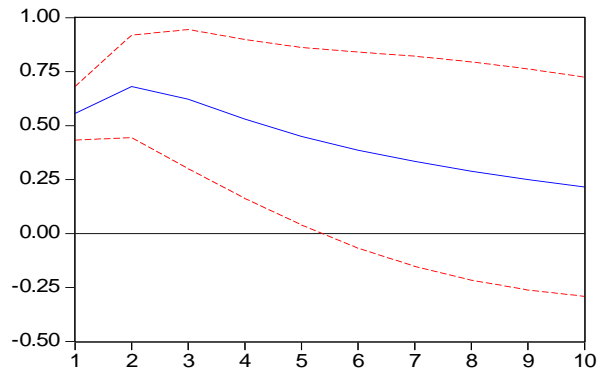


Response of BEEFCONSUMPTION to BEEFCONSUMPTION

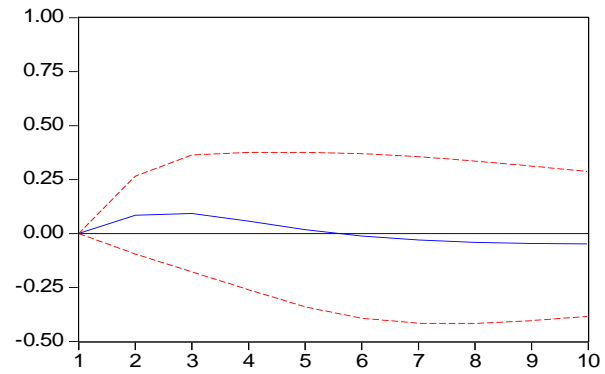


Response to Cholesky One S.D. Innovations ± 2 S.E.

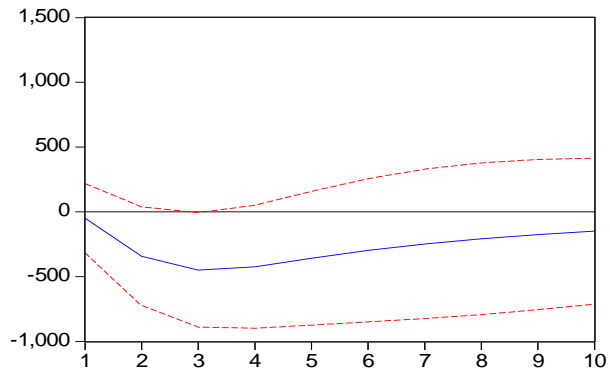
Response of CO2 to CO2



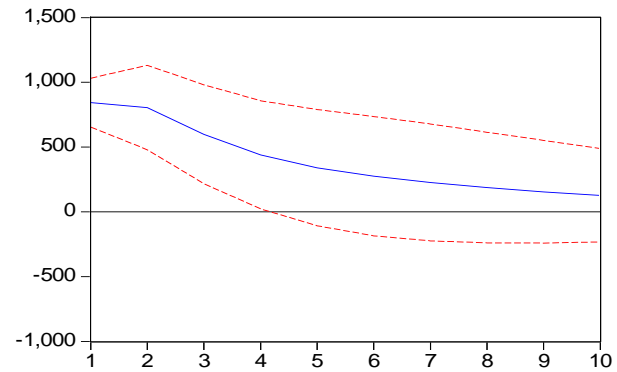
Response of CO2 to BEEFPRODUCTION



Response of BEEFPRODUCTION to CO2



Response of BEEFPRODUCTION to BEEFPRODUCTION



Discussion

- A beefless Monday per week would cut total emissions by 0.3 percent annually.
- If all U.S. Americans practiced Meatless Mondays, we would reduce the U.S. national GHG emissions by 0.6 percent

conclusion

- o Our findings confirm this hypothesis that meat consumption has a positive effect on the level of greenhouse gas emissions in the U.S.
- o we concluded that some movement such as **Meatless Monday** movement must be encouraged in order to shift the meat consumption among the consumers.



Thank You