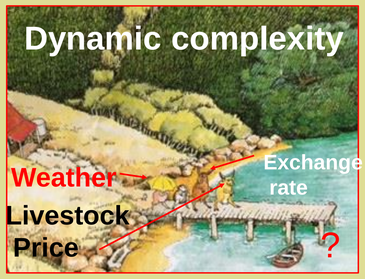
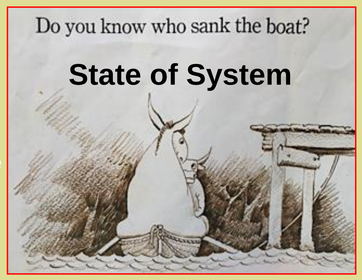
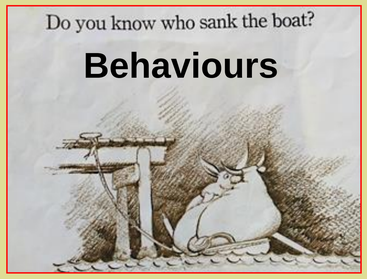
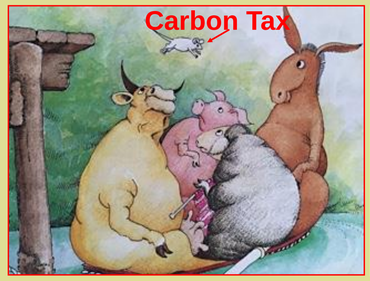








Author: Pamela Allen, Puffin Books

Could the carbon tax sink the boat?

The impact of Australia's carbon tax on the Red Meat Processor.

Dr Sue McAvoy, Post-doctoral Research Fellow, University of Queensland Business School, Australia

Abstract

The Australian Carbon Pricing Mechanism (CPM), was implemented in July 2012 and repealed two years later. Computable General Equilibrium Modelling (CGE) modelling, founded on neoclassical economic theory, informed the government's policy decision to impose a non-shielded carbon tax on Australia's value added manufacturing export industries, despite such modelling being criticised for its theoretical and empirical weaknesses.

Many of these industries did not have the structures necessary to qualify for the emissions intensive trade exposed (EITE) protection used globally to prevent carbon leakage /loss of competitiveness. Red meat processing is a significant Australian export industry. Under the CPM, it paid a non-shielded carbon price which neither its international nor smaller domestic competitors paid. Commissioned studies to investigate the impacts of this policy on competitiveness have relied almost exclusively on CGE modelling.

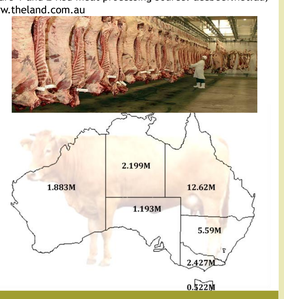
This thesis offers an alternative investigation based on Systems Dynamics, a methodology that can accommodate the industry's dynamic complexity.

SD modelling outcomes suggest (1) that the carbon price contributes to an uncompetitive operating environment under certain scenarios, even though the carbon tax is only .35% of total earnings and (2) that in successfully addressing criticisms levelled at CGE models, System Dynamics offers a valuable supplement to the dominant modelling paradigm.

Background

- Red Meat Processors (RMP's) are Australia's largest food manufacturer and exporter, contributing $16.2 billion or 1.3 % of total GDP and .9 % ($5.5 bill) of Australia's household income (AMPC, 2013-2017).
- The sector ranks fourth nationally in export contribution to FTE behind coal and metal ore mining and primary metal manufacturing (AMPC, 2013-2017).
- The area of grazing land operated by beef cattle/sheep businesses is estimated to be more than 336 million hectares; over 40 per cent of the total area of Australia. ABARE-BRS (2010)

Figure 1 and 2 Red meat processing Source: accbeef.net.au; www.theland.com.au



The Main Problem

Will Australia's carbon tax enable red meat processors (liable to pay the tax) to remain financially competitive in their domestic and global environment?

At $24/tonne, the tax adds 1.73 cents/ kg of HSCW or $17.30 per tonne. The RMP industry has reported the pressures that the additional carbon costs are bringing to an at times marginal industry (Linden et al., 2011; Meta Economics Consulting Group, 2011).

A desktop analysis suggests the RMP's profit margin is highly variable and carbon costs (.35% of gross sales) will be a financial impediment when the profit margin oscillates around zero.

This outcome does not consider the impacts of adverse exchange rates, weather or global market failures.

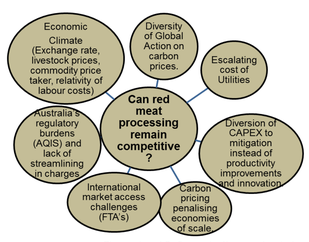
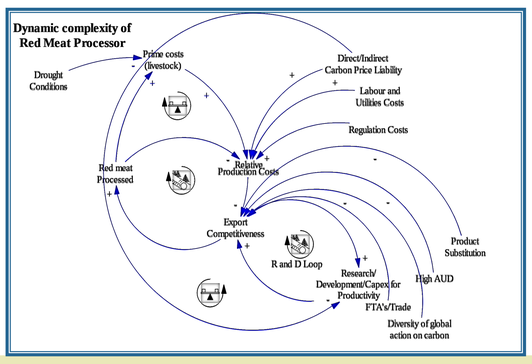
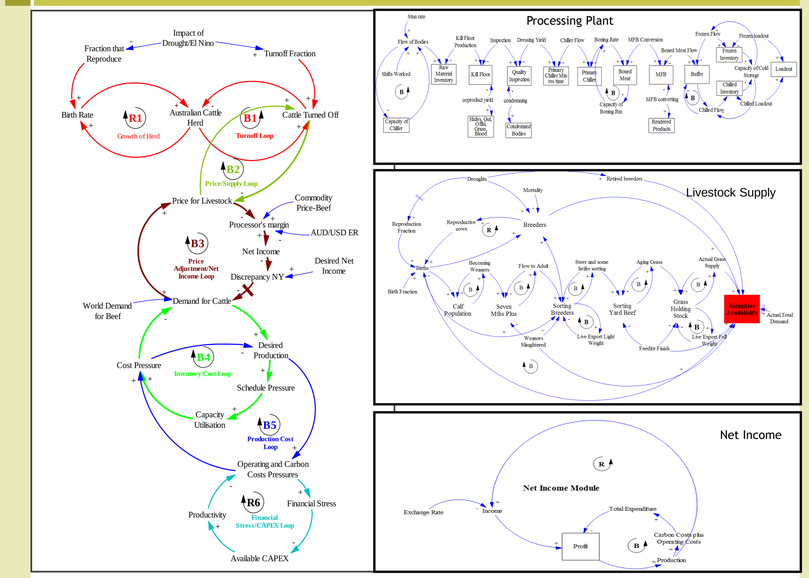


Figure 4 and 5: Dynamically complex industry



The Conceptual Model



Figures 6a, b, c, d Conceptual diagram and causal loop diagrams for livestock market, supply chain and net income.

The Simulation Model

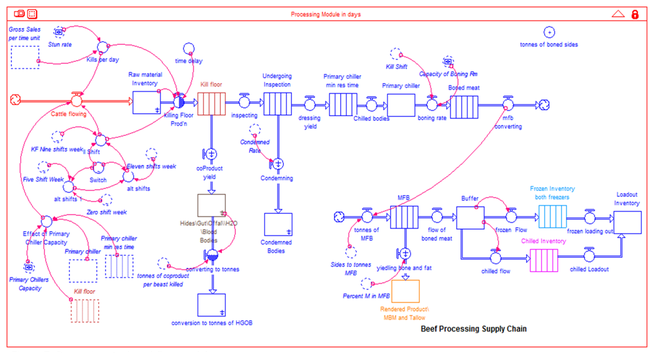


Figure 7. Processing stock and flow model

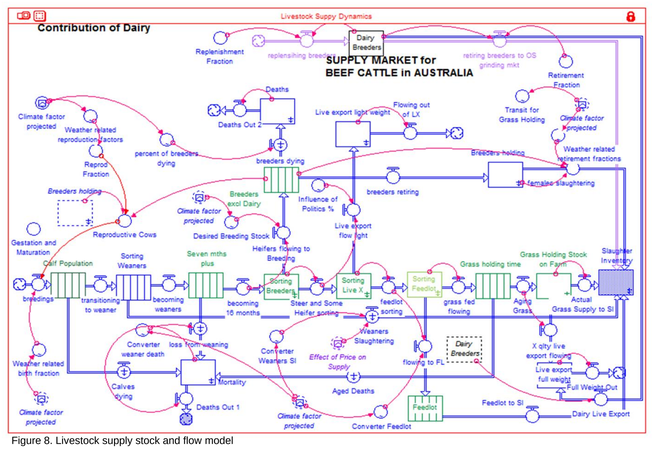


Figure 8. Livestock supply stock and flow model

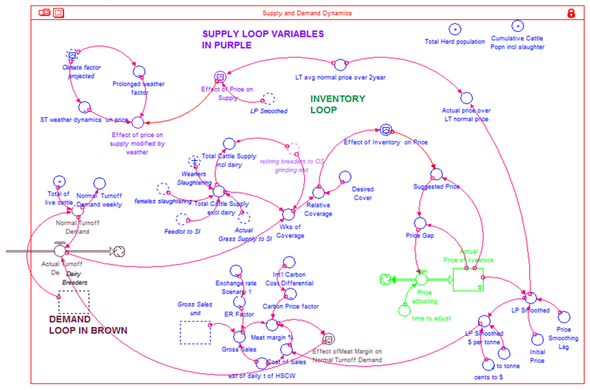


Figure 9. Livestock market supply and demand dynamics stock and flow model.

Results

Two models were created. Results are presented for base case Model 2 which is a yearly time step, parametised at an initial year of La Nina (rain) followed by El Nino (drought) and CT at $0, $24 and $100. The exchange rate constant at USD.94c as is the AUD gross sales value. Model 2 is initialised with beginning of 2012 data. The dt is ¼ and simulation period is 12 years. Base case livestock price, production (slaughter) and net income are presented (LHS). The base case is varied on the RHS for La Nina weather dynamics.

Figure 10. Production and Livestock Price under El Nino weather (drought)

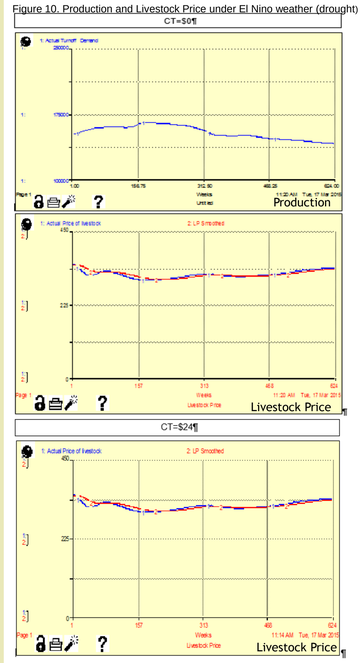


Figure 11. Production and Livestock Price under La Nina weather (rains)

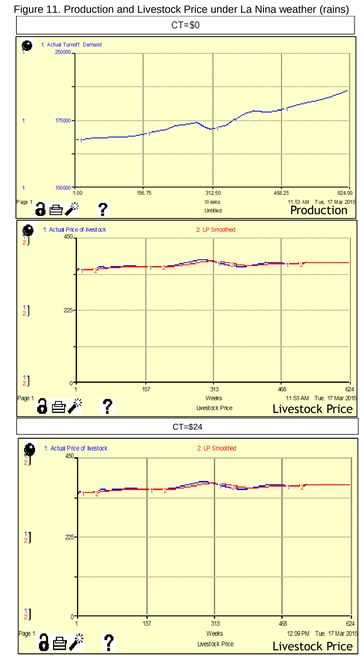
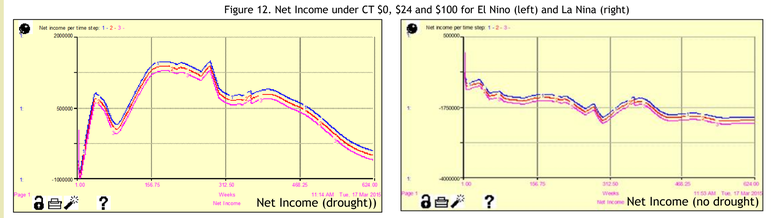


Figure 12. Net Income under CT $0, $24 and $100 for El Nino (left) and La Nina (right)



Conclusions

- The model has been able to represent the components of the industry and produce simulations that replicate past behaviours and industry trends in key output variables. System Dynamics does offer a useful supplement to the computable general equilibrium modelling.

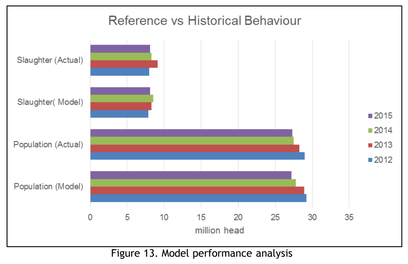


Figure 13. Model performance analysis

- The simulations suggest Australia's carbon does impact competitiveness. Under El Nino conditions (low livestock price, high turnoff) the RMP can operate profitably. However, when livestock prices are high and herd rebuilding programs are in expansion (La Nina weather) RMP margins are traditionally low meaning they are less able to absorb the additional costs.
- In isolation, the carbon tax appears to make little difference to the firm's profitability. However, the tax needs to be assessed in light of the dynamic operating environment and consequential prevailing profit margins. Insights are that the dynamic operating environment of the RMP can erode profit margins to the point where the additional .35% of gross sales cost added by the tax cannot be afforded. To this end, the carbon tax can be said to be affecting the competitiveness of the RMP.