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The Economics of the Red Meat Industry: A Value Chain Perspective¹

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1. Introduction

Today I have been allocated 20 minutes or so to discuss the “Economics of the red meat industry”. No small task. I thought about reporting the results of different analyses I have done in relation to beef production systems, marketing margins, or large industry-level models. But, given that we have already had an excellent overview of domestic and overseas markets from MLA, and detailed analyses from the processor and producer perspectives, I thought that I might try something a little different and make some suggestions about how the whole industry might improve future performance.

I start by asking “Whose economics is it?”, and follow by suggesting that the answer is “It must be everyone’s”.

This leads to the idea that the way to analyse the economics of the red meat industry is by assessing and evaluating the performance of the value chains that comprise this industry. This is based on the following two assertions:

First, global food, beverage and fibre markets (of which the Australian red meat industry is a prime example) are now mostly networks of global value chains. Increasingly such global chains are private and powerful, closely coordinated or fully vertically integrated, self-regulated and experience-based (Griffith et al. 2012, 2015). The old ways of analysing the performance of these markets, such as described for example in Kohls and Uhl (1980), are no longer appropriate.

Second and following, value chains have now become the preferred unit of enquiry for analysing and evaluating global and domestic food, beverage and fibre markets (Baker et al. 2014, Griffith et al. 2015).

¹ A revision of an Invited presentation by Garry Griffith at the UWA Institute of Agriculture 2015 Industry Forum “Where are we heading with the red meat industry?”, The University of Western Australia, Crawley WA, July 9. We acknowledge the inputs of Derek Baker to the development of the concepts outlined in this paper.

2. What are value chains?

The concept of a value chain was developed and popularized by Porter (1985) as part of a competitive strategy to achieve superior business performance for an individual firm. Porter defined value as the amount buyers are willing to pay for what a firm provides - the 'value chain' is then the combination of a set of generic value-adding activities operating within a firm – activities that combine to provide value to customers. This idea extends to broader concepts of value systems and networks for linkages outside this firm. We use the term "value chain" generically to refer to all of these possibilities (Griffith et al. 2014).

Another definition that promotes the same message is that value chains "create, capture and transmit" value.

The value part comes from the value to the buyer, and in the case of the red meat industry this means the final consumer, domestic or foreign. Thus we always start from the consumer point of view. In this context, we often talk about the typical consumer who on average:

- consumes so many kgs of red meat per year
- pays so many \$/kg for rump steak or lamb chops or mince, etc.
- responds in a given way to changes in prices of red meats and competing products, income, perhaps advertising, etc. (behaves according to estimated elasticities of demand).

We use diagrams like Figure 1 to explain the economics of consumer demand; that is, how consumers respond to changes in prices and other influencing factors, and the level of aggregate willingness to pay.

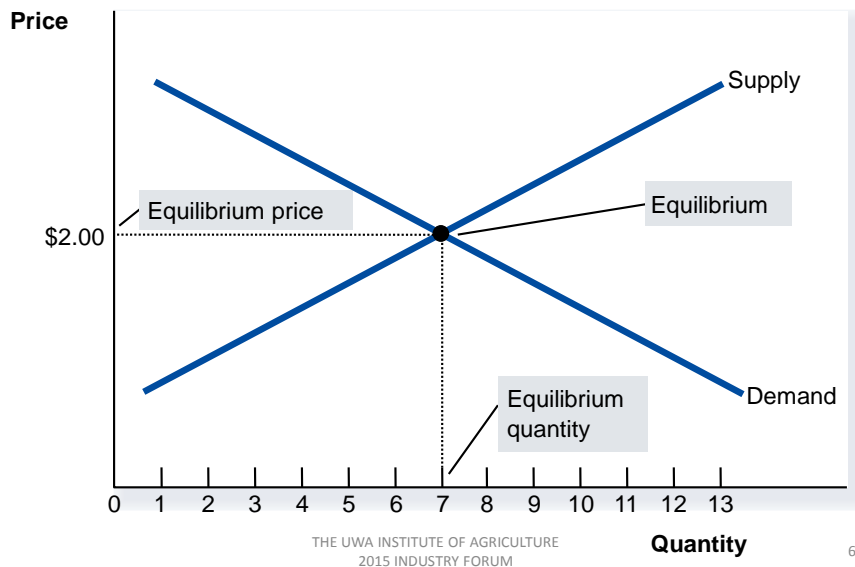


Figure 1. The equilibrium of supply and demand (Gans et al. 2012)

But consumers are not all the same. This is implied in the demand curve shown in Figure 1 which is the horizontal summation of all consumers in that market. The slope of the curve says that there are consumers with different levels of preferences for the product being modelled (Gans et al. 2012). We also

know from marketing agencies and others that there are different categories of consumers in most market situations who respond differently to the various drivers of consumption. We also know this from our own behaviour – we make different decisions about the same purchase choice depending on where we are, who we are with, what the purchase will be used for, etc. A survey of Australian beef purchasers by Morales et al. (2013) came up with the categorisation shown in Figure 2.

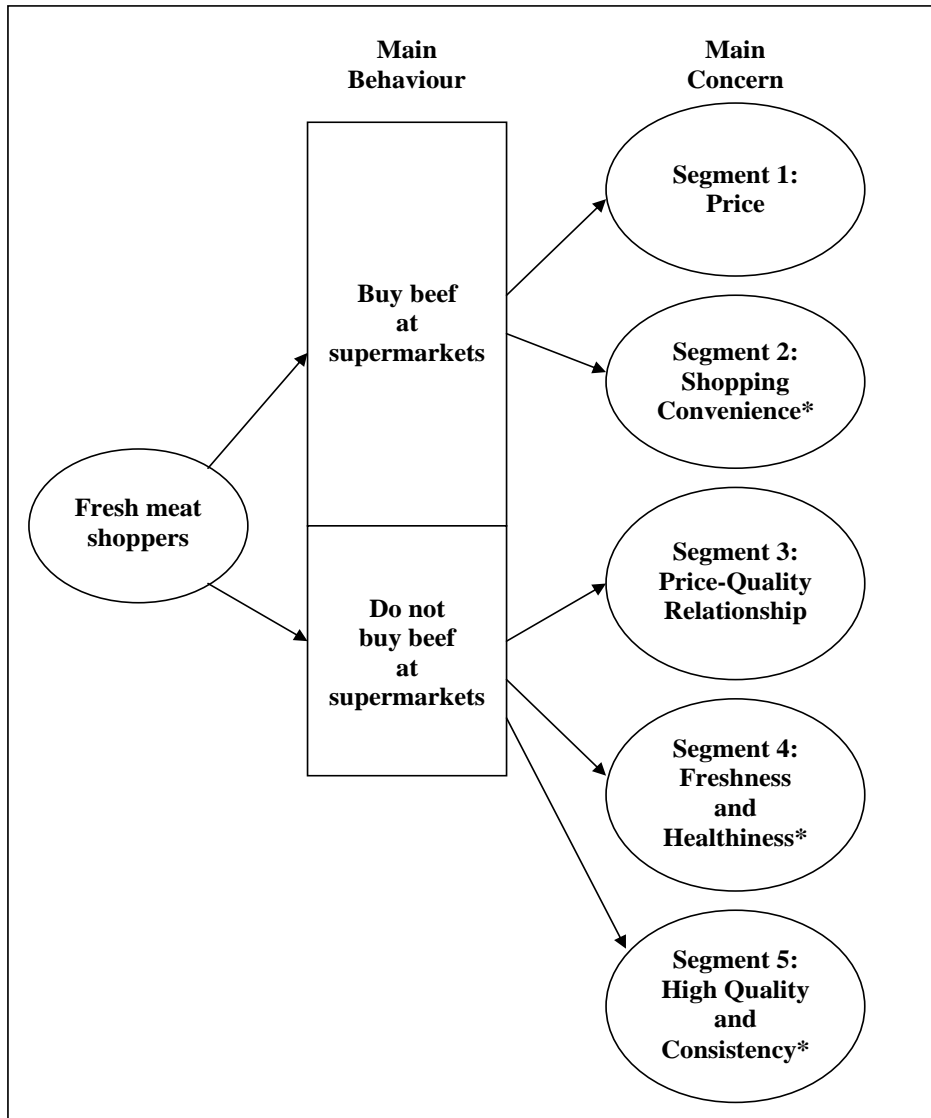


Figure 2. Categories of Australian beef purchasers (Morales et al. 2013)

3. Value chain concepts of competitive strategy and strategic fit

The concept of competitive strategy

Given that consumers are not all the same and display different preferences for different bundles of attributes of products, value chains have to choose which particular sets of consumer demands/needs/priorities they are attempting to satisfy (for example, like those portrayed in Figure 2). This choice is the foundation of the competitive strategy of the value chain. In the case of the consumers surveyed in Figure 2, it is not only the set of attributes that is delivered that is important, but also the outlet at which the consumer makes their choice.

The concept of strategic fit

Strategic fit is “the nature of the link between the customer priorities that the competitive strategy of a value chain hopes to satisfy, and the capabilities that are available in the value chain to implement that objective.” (Chopra and Meindl 2012). That is, matching up as closely as possible what the chain is hoping to achieve with the resources available to do the job.

The textbooks (such as Chopra and Meindl 2012) differentiate between value chains that focus mainly on being **responsive to customer needs** and those that focus mainly on **supplying at the lowest possible cost**. The rule of thumb is that if demand uncertainty is low, a low-cost value chain is the best strategic fit; conversely if demand uncertainty is high, a responsive value chain is the best fit.

However, it is rare that a value chain can specialise in either one or the other – usually there are joint products from the value chain and the chain has to choose the best combination of those products. That is, there is a trade-off between them.

How do you choose?

The trade-off is operationalised using the familiar concept of a production possibilities curve (Figure 3) (Gans et al. 2012, Mounter et al. 2015). This curve shows the various levels of the two possible outputs (broadly, a product with responsive attributes and a product with low-cost attributes) that can be produced by the production process using the same amount of inputs. In Figure 3, point A is a technically inefficient place to produce, whereas points B and C (and any other point on the curve) are technically efficient places to produce. We use the concept of an isorevenue curve together with the production possibilities curve to determine the optimal mix of outputs (which point on the curve) (Figure 4). The isorevenue curve shows the various levels of the two possible outputs that generate the same level of revenue. The tangency between the production possibilities curve and the isorevenue curve shows the optimal combination of “responsive” and “low cost” outputs to produce – quantities which are technically possible to produce **and** generate the highest amounts of revenue. In Figure 4 we assume little or no payoff for responsiveness, so the isorevenue curve is a 45° line (equal returns from both “responsive” and “low-cost” products) and the optimal point D is close to the maximum for a low cost product.

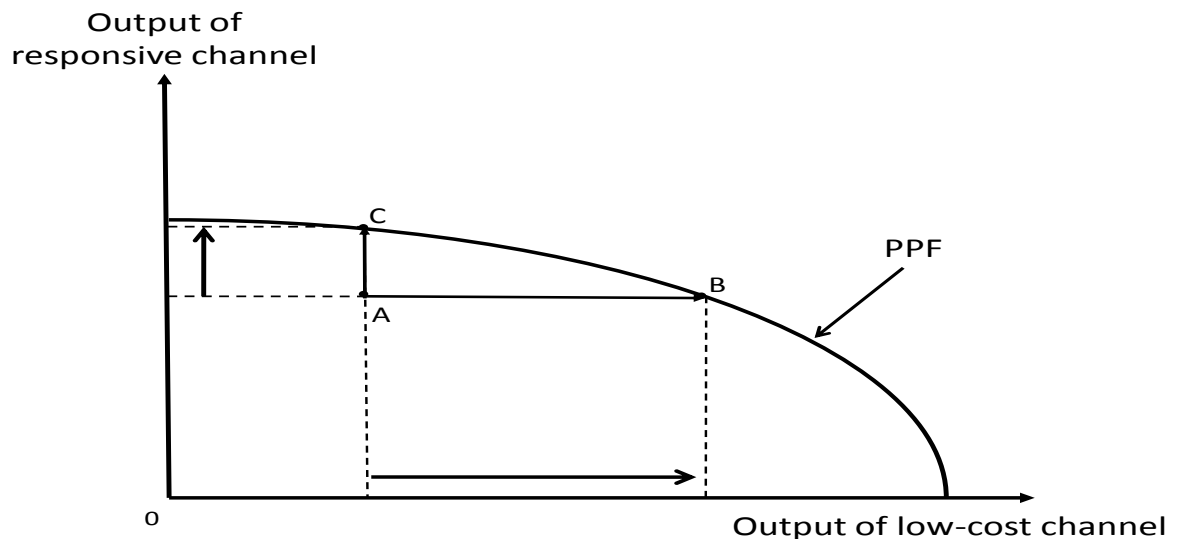


Figure 3. Production possibilities curve and strategic fit (Mounter et al. 2015)

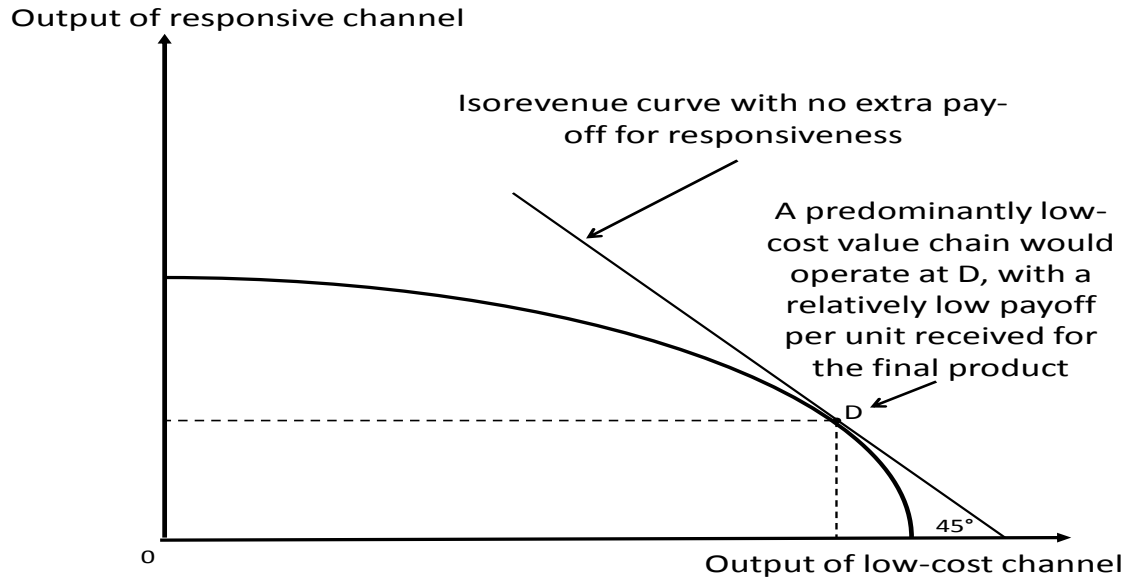


Figure 4. Production possibilities curve, isorevenue curve and strategic fit (Mounter et al. 2015)

Let us compress all of the different types of consumers (such as those in Figure 2) into two broad categories: price sensitive, and quality sensitive. If we look first at price sensitive consumers, we know there are more of them, therefore there is always a market, they require minimal assurance standards but there is little scope for rewards for quality. In this case, the best strategic fit is **low cost supply**.

If we now look at the quality sensitive consumer, there are fewer of them, there is more risk because demand uncertainty is higher, they require more exact assurance standards which means higher cost, but there is greater scope for rewards for quality. In this case, the best strategic fit is being **responsive to consumer needs**.

Because it costs more to produce a quality output, fewer units of “responsive” output can be produced with the same resources than units of “low cost” output which do not cost as much. Conversely, with rewards for quality, fewer units of “responsive” output are required to generate a given level of revenue than units of “low cost” output which has no reward for quality. Thus the production possibilities curve is skewed to the left and the isorevenue curve is flatter than a 45° line.

4. The drivers of value chain performance

Once we have the competitive strategy and the strategic fit sorted out, we are then able to map and analyse the value chain from the point of view of the typical set of performance drivers as outlined in Figure 5 (Chopra and Meindl 2012). Different value chains focus on different drivers according to their overall strategy and the particular resources they have available, and therefore generate different opportunities for improving chain profit.

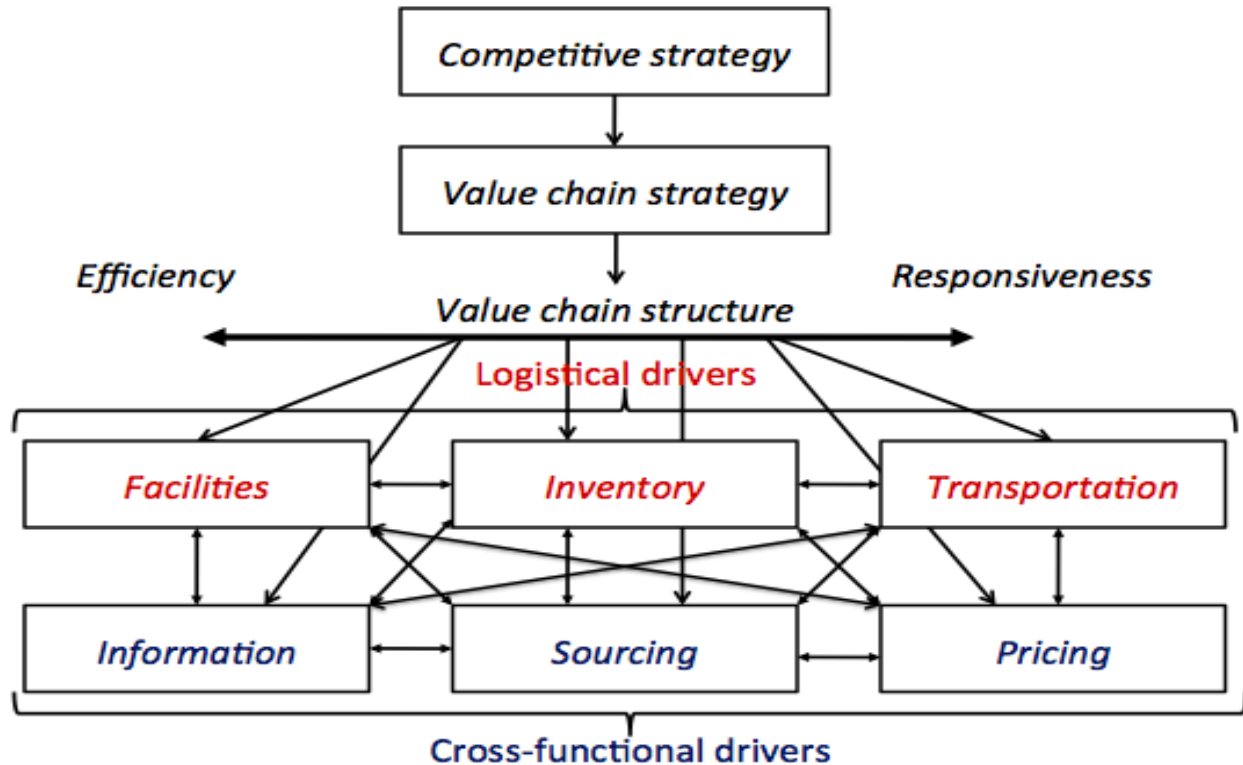


Figure 5. Logistical and cross-functional drivers of value chain performance (Chopra and Meindl 2012)

5. How to improve responsiveness – the example of Meat Standards Australia

A common choice facing value chains is whether to “upgrade”: that is, to assess whether there is a sufficient expected reward in terms of increased consumer willingness to pay for a more responsive set of product attributes that would justify investing in the production process to generate such a set of attributes. Many international agencies promote upgrading as the way to develop small-holder agriculture in developing countries. We argue that the concepts outlined above can assist in such a choice, but how do we implement these concepts in practice? To do it properly requires a lot of data to be able to specify and estimate functions for the production possibilities curve and the isorevenue curve, and then some mathematics to generate the optimal point. Alternatively, we can look at existing systems and infer an optimal point by examining past performance data.

One such system already in place is Meat Standards Australia (Griffith et al. 2010). MSA is a grading scheme to guarantee tenderness (for a specific cut cooked in a specific way) (Polkinghorne et al. 1998, 2008, Thompson 2002). Past research work has shown the following results:

- There is a measurable willingness to pay for MSA graded cuts by consumers (Griffith et al. 2009, Griffith and Thompson 2012).
- There is measurable additional value transmitted across the whole value chain (Griffith et al. 2010, Griffith and Thompson 2012). These values are shown in Figures 6 and 7.

Figure 6. Average Distribution of the MSA Retail Premium, 2004/05-2010/11

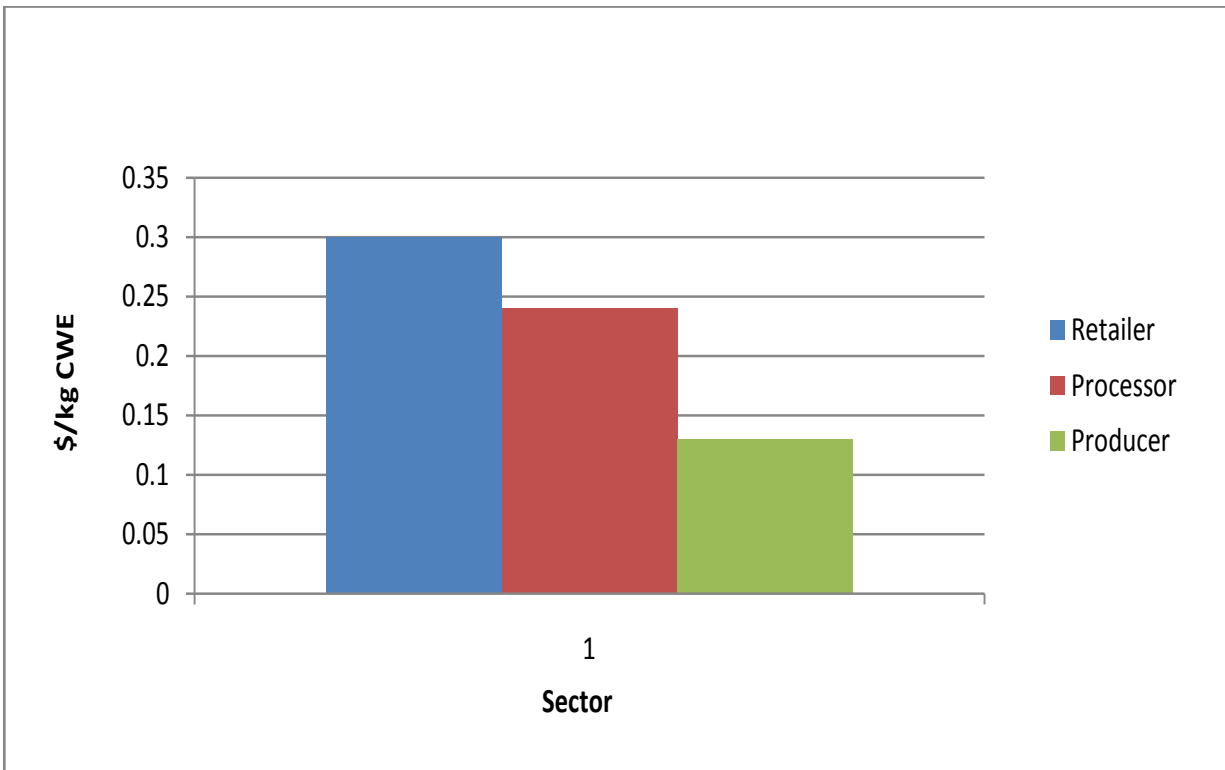
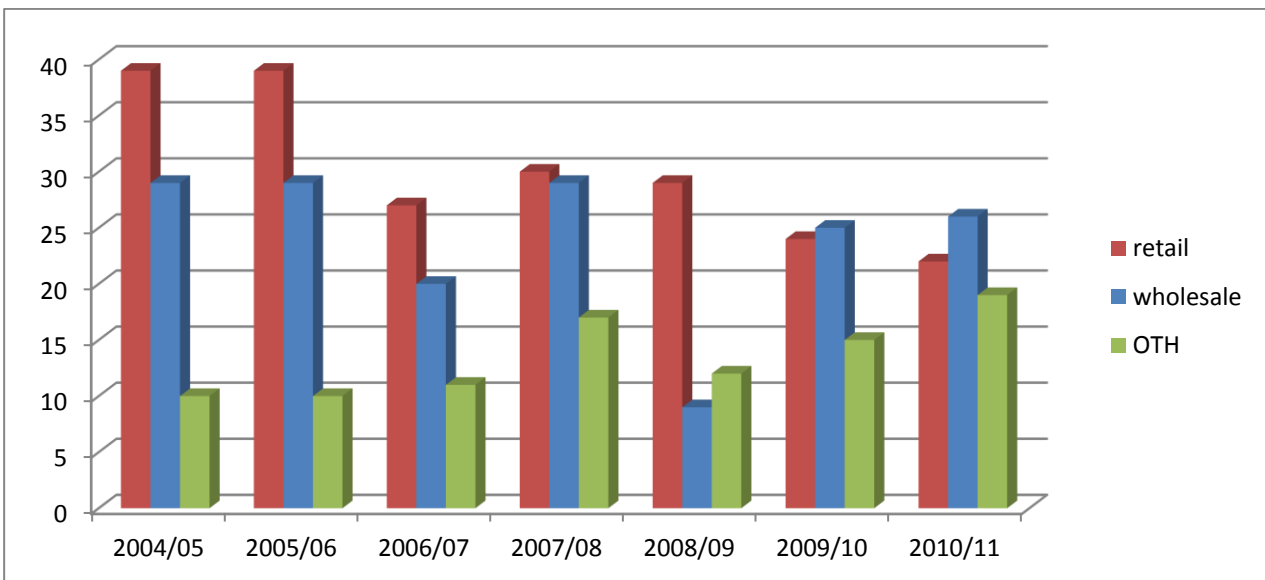


Figure 7. Variability of MSA Premiums Over Time, 2004/05-2010/11



Therefore, there is a measurable premium for responsiveness/quality for MSA graded beef relative to ungraded beef. This can be portrayed in diagrammatic form as a further flattening of the isorevenue curve, as shown in Figure 8. Thus, if there are higher rewards for quality as measured by MSA, then there is an incentive for the value chain to produce more of the higher value product and less of the lower value product. In Figure 8 this is point C rather than point B.

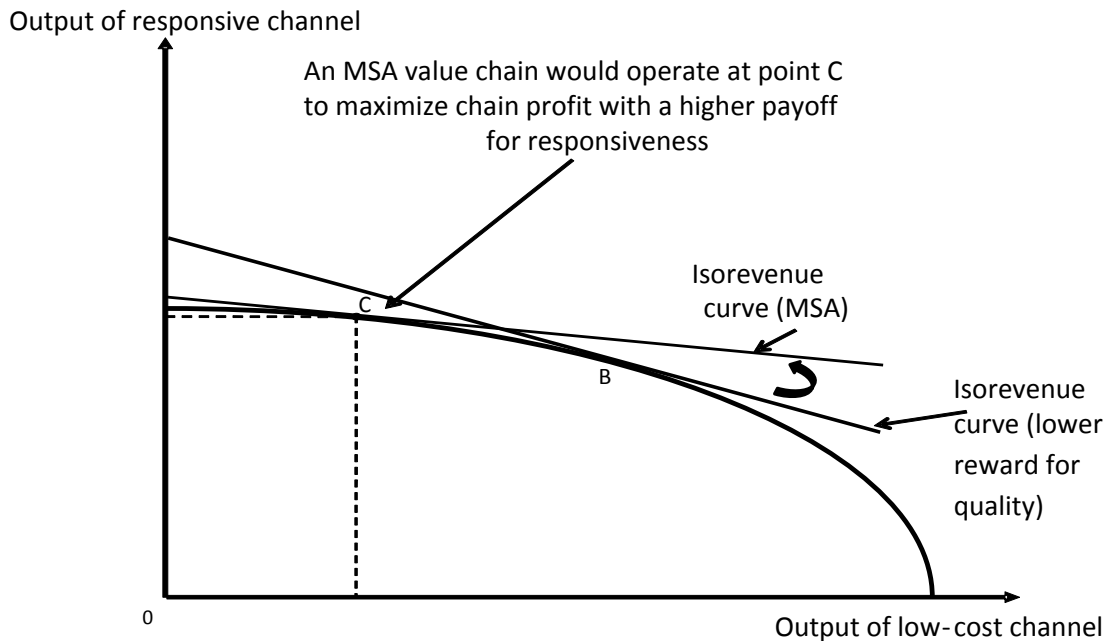


Figure 8. Strategic fit and MSA (Mounter et al. 2015)

6. What can we do better?

The red meat industry has invested wisely in industry systems like MSA which are able to create and capture greater willingness to pay by red meat consumers, and to provide mechanisms for this extra value to be transmitted back to processors and producers so that they have the incentive to invest in achieving the required quality attributes. However, using the value chain concepts outlined above, we can suggest three avenues where the red meat industry could improve its future prospects.

First, make the most of the MSA model:

- Mostly beef is sold as MSA graded or not (eg Woolworths).
- However, it is well known Australian consumers have higher willingness to pay for MSA 4 star and MSA 5 star (Lyford et al. 2010). See Figure 9.
- There are several examples of niche market businesses which have capitalised on this (Rod Polkinghorne in Melbourne, Richard Gunner in Adelaide).

- Figure 9. Willingness to pay (expressed as a ratio of 3 star grade) for Australian, Japanese, United States and Irish consumers (Lyford et al. 2010, their Figure 1)

Second, enhance the traceability of the retail product:

- Use new information technologies to track red meat from live animal to retail portion (Doljanin 2012, Doljanin et al. 2015).
- Implement a predictive sorting system that provides real-time information on the kill floor allowing carcasses and then primals to be organised based on individual customer needs.
- There are examples of this type of traceability in the Dutch and Danish pigmeat processing systems.

Third, provide effective feedback to producers:

- Effective value chains contain product flows, information flows and value flows.
- We now do a good job on some quality attributes, but what about saleable meat yield?
- Use new IT and scanning technologies to develop component pricing models that can inform breeding and management decisions (Thompson et al. 2012).
- There are examples of component pricing systems in the dairy and pigmeat industries.

7. Conclusion

The economics of the red meat industry means the economics of satisfying consumer requirements within a value chain context.

Value chains choose to be low cost or responsive, or some combination, depending on the type of consumer they target. Well tested theoretical concepts are available to assist in such choices.

By using such concepts, there have been large improvements in recent years in some components of the Australian red meat value chain, but more can be done to improve its future prospects.

Figure 1. Willingness to pay (expressed as a ratio to 3 star grade) for Australian, Japanese, the United States and Irish consumers, adjusted for demographic and meat consumption preferences

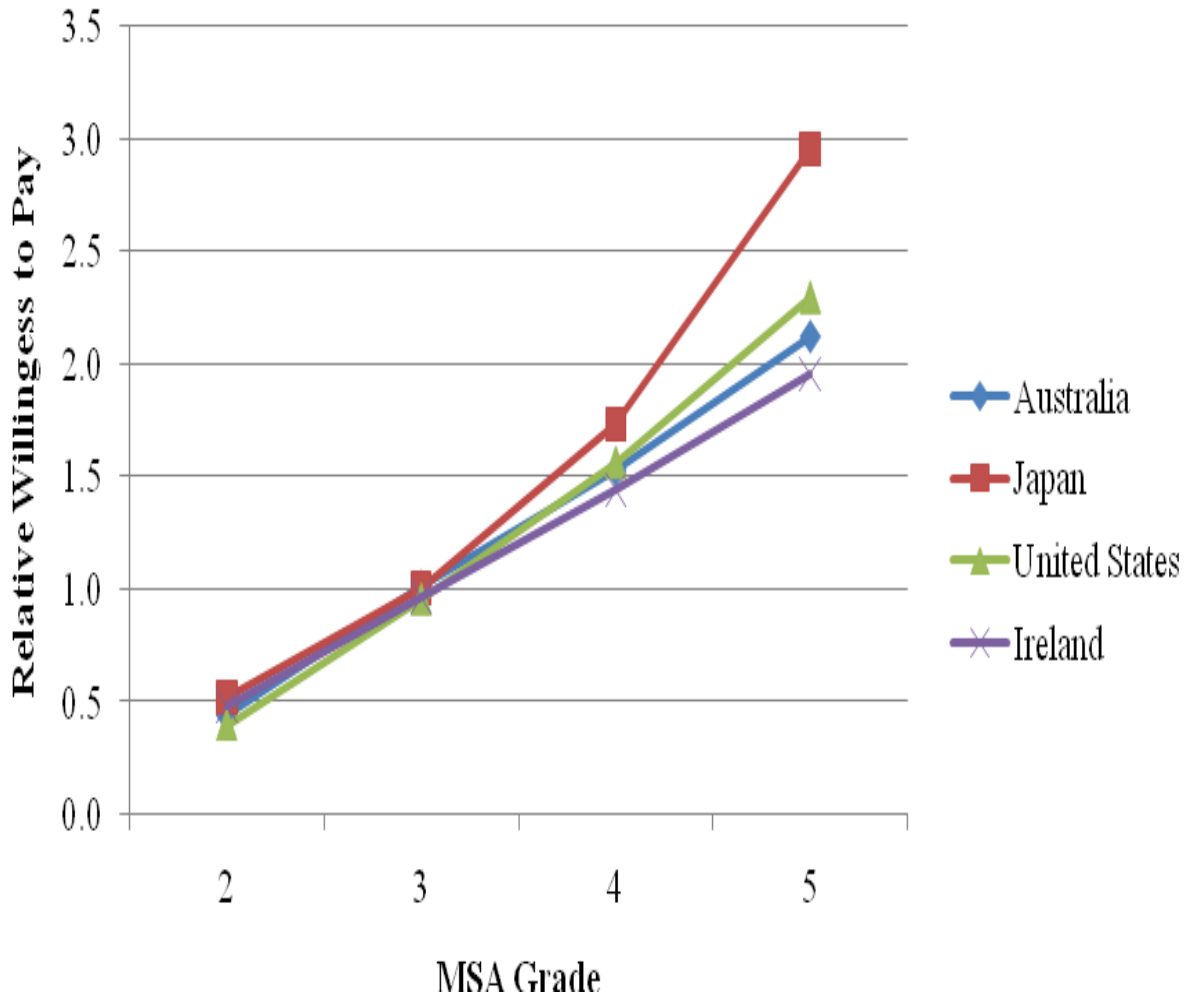


Figure 9. Willingness to pay (expressed as a ratio of 3 star grade) for Australian, Japanese, United States and Irish consumers (Lyford et al. 2010, their Figure 1)

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