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THE ECONOMIC DIMENSION OF GEOGRAPHICAL INDICATIONS

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I. INTRODUCTION

1. In the debate on Geographical Indications (GI) the common approach often address the unique interactions between a specific geographical area, the impact of traditional human interventions and the specific attributes of local plant species or animal breeds. More recent arguments claim that the economic underbelly of Geographic Indications should more frequently be explored.

2. The purpose of this paper will not be an attempt to provide all the answers in the debate on the economics of GI. It will rather be a narrative description of some thoughts in the Western Cape Province of South Africa. The first part of the paper will focus on a theoretical base regarding the specifics pertaining to agricultural commodities, the implications of these circumstances and ways of ameliorating its negative effects. In the second part of the paper an attempt will be made to explore some of these implications with the aid of a specific case study; that of Karoo Lamb.

II. THEORETICAL BACKGROUND

3. Although the utility that various people (producers and consumers) extract from farming varies significantly from person to person, one basic role of the Agricultural Sector still remains; that of provider of food. In most countries of the world prices are the mechanism (albeit often somewhat distorted) through which consumers of food convey their preferences to producers. These prices signal preferences in terms of product type, range, quality standards, embedded values, etc and changes in tastes, income and wealth over time. As certain factors such as the number of people and technology changes in conjunction with the aforementioned, prices will also change over time.

4. The relationship between the change in price and the change in the volume of a product demanded can be measured with a mechanism called price elasticity (Pe) of demand (PeD) or supply (PeS). This measurement of sensitivity (or responsiveness) in the market place can be written as follows:

$$Pe = \frac{\% \text{ change in quantity}}{\% \text{ change in price}}$$

5. The implication of this formula is that if prices would change at the same rate as volumes, price elasticity would approach unity (in other words, 1). However, if the change in quantity were to be relatively lower than the associated change in price, Pe would be <1 and we would refer to an inelastic product. If the change in volume was to be relatively more substantial than the change in price, Pe would be >1 and reference would be made to an elastic product.

6. An overview of the price elasticity of aggregate demand and supply in the Agricultural Sector is provided in Table 1. According to most text books (in this case personified by Bonnen and Schweikhardt for global characteristics and Liebenberg and Groenewald for

South Africa) the price elasticity of aggregate demand for agricultural products over the short term is less than one and carries a negative sign (as price increase the volume demanded would decrease and only in certain exceptional circumstances would both the price and volume demanded increase). The reason for this inelasticity of food is quite simple in that food is one of the “sanitary conditions” described by Maslow and Herzberg or, in other words, “man must eat”. A person will usually spend his/her first dollar on such basic requirements as food, shelter and safety, but consumption of food soon reaches an upper limit. This is clearly illustrated by income elasticity of demand that approaches unity in developing countries (every additional dollar is spent on food) while it is rather inelastic in developed countries. Over the long term the PeD approaches unity.

7. The information in the table conveys a similar, but inverse, picture with respect to the price elasticity of the aggregate supply of agricultural products over the short term. The price elasticity of aggregate supply is smaller than one but carries a positive sign which indicate that aggregate supply of agricultural products is also relatively inelastic. Over the longer term price elasticity of supply approaches unity. The reason for this situation can be found in the sunken cost (barriers to entry) that is required before agricultural production can take place. For instance, once you have planted an orchard of pears you can only harvest pears from that orchard for the next couple of decades. Similarly, a milking parlour can only be used to milk cows and not even goats or sheep can be milked in it without significant capital investments. It follows that this short-term stickiness of response by farmers is often ascribed to asset fixity. Nevertheless, over the longer term change is more responsive and approaches unity.

Table 1: Some characteristics of aggregate demand and supply in the Agricultural Sector.

Characteristics	Low Income “Developing” Economies	High Income “Developed” Economies	South Africa
Income Elasticity of Demand	0,8 – 0,9	0,1 – 0,2	0,7
Price Elasticity of Demand (SR)	-0,4	-0,3	-0,337
Price Elasticity of Demand (LR)	-1,0	-1,0	
Price Elasticity of Supply (SR)	0,1 – 0,2	0,1	0,28
Price Elasticity of Supply (LR)	0,4 – 1,2	0,8 – 1,0	1,34

Source: Bonnen & Schweikhardt (1998) and Liebenberg & Groenewald (2007)

8. The implications of the relative inelastic demand and supply functions for aggregate demand and supply in the Agricultural Sector can be explained with the aid of the graphical representation in Figure 1. In this figure the demand function of agricultural products is represented by D_0 and the supply function by S_0 in the baseline. Economic theory dictates

that, under these conditions, the optimum price will be where the supply and demand functions intersect (at P_0) and that the market will be cleared with quantity Q_0 of our product to be traded between producers and consumers.

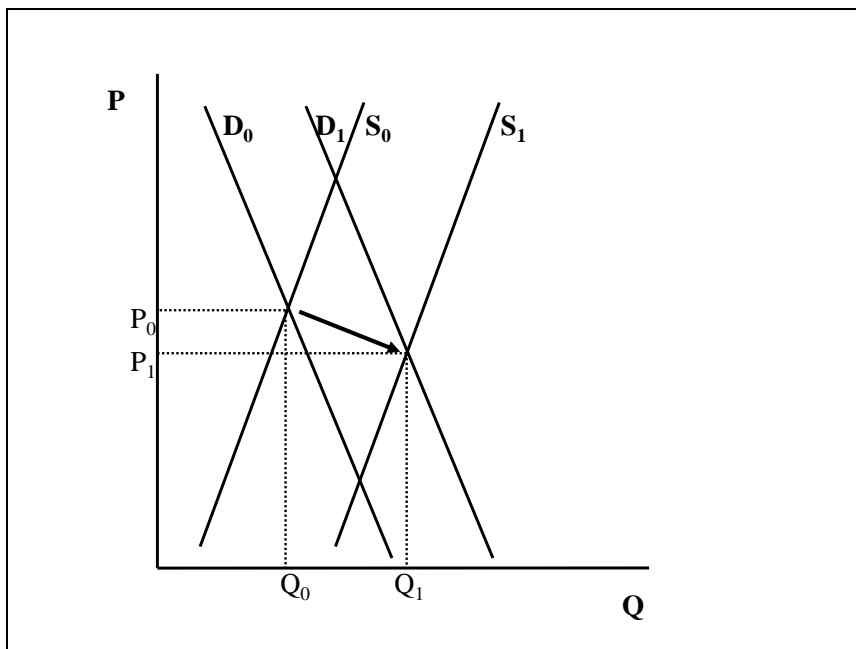


Figure 1: Graphical representation of the problem of low returns.

9. One of the factors that make farming unique is that it is totally dependant on nature and its vagaries. It follows that volume supplied will often be either higher or lower than expected by the market. This would result in a movement of the price on the demand and supply functions. However, over time other factors such as technology, the prices of other products, income, social factors, tastes, preferences and the number of people changes. As new agricultural technology is usually either yield increasing or cost decreasing (i.e. mechanisation, the green revolution, biotechnology), it follows that any new technology in farming will result in the movement of the supply function to the right (from S_0 to S_1). At the same time the demand function usually also move to the right (from D_0 to D_1) due to population and economic growth with the result that a new equilibrium develops at price P_1 and quantity Q_1 .

10. The implication of this movement is that downwards pressure exists on the prices of agricultural commodities, albeit that this long-term trend is usually hidden by short-term movements in prices. It follows that only the early adopters of a technology will reap any benefits as any substantial adoption of the technology will lead to a decline in the price that producers receive. The result is that, in order to financially survive, the next set of technological innovations needs to be adopted by farmers and similar benefits will accrue to the early adopters. Due to the fact that farmers need to be at the forefront of the technology to survive (they need to run flat-out just to stand still), this theory has been coined the Treadmill Theory (see *inter alia* Cochrane, 1958; Bonnen and Schweikhardt, 1998;

Ritson, 1982; Gardner, 1992). This should not be construed as a plea to limit advances in agricultural technology as such advances add to the general social welfare (this is a debate for another day), but rather as an analysis of the reality farmers need to cope with.

11. This reality for South African Agriculture is graphically represented in Figure 2. On the one hand the deflated producer price index declined from a high of 234 in 1974 to a low of 143 in 1999. Subsequent changes in the price environment did result in some upward momentum in producer prices to the high of 202 in 2007.

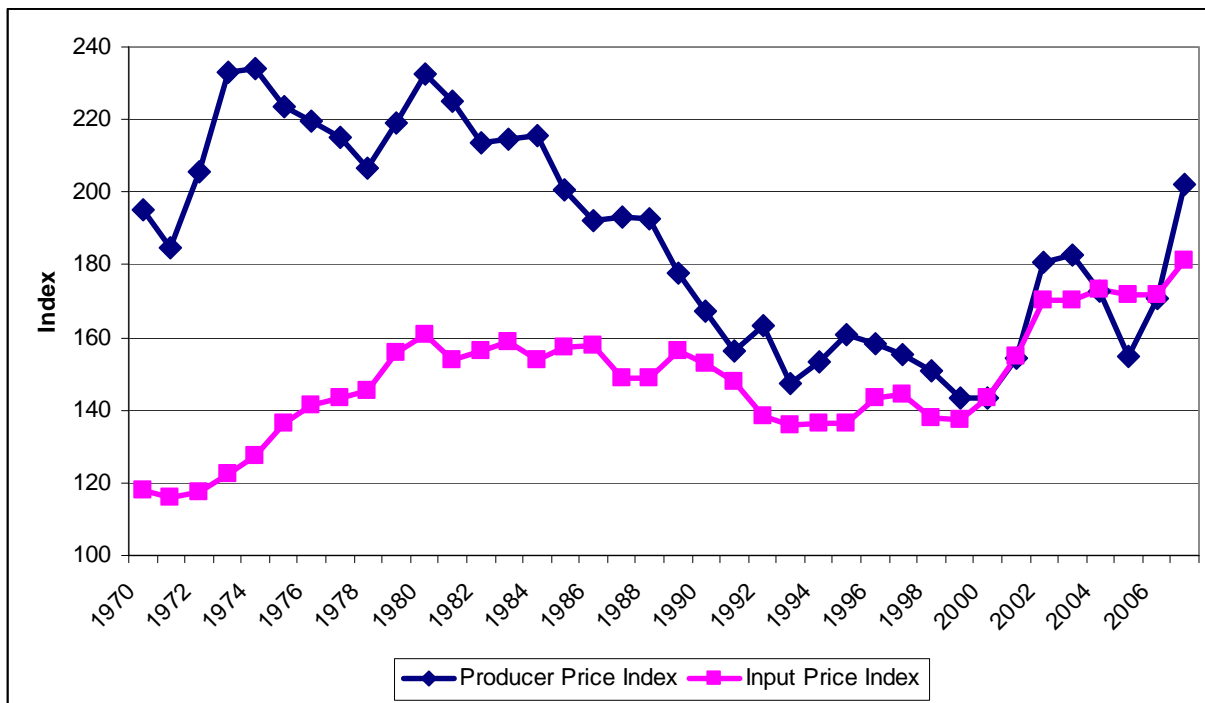


Figure 2: The Cost / Price pincher in South African Agriculture.
Source: Abstract (2008)

12. The decline in real prices is only one side of the coin. The other side reflects the changes in input prices used in farming. By scrutinizing the deflated Input Price Index in Figure 2, it becomes clear that it increased from a low of 116 in 1971 to the high of 181 in 2007. Incidentally, the rapid increases in the Producer Price Index from 2000 to 2003 and since 2005 have been offset by similar increases in the Input Price Index. The point is that the area between the Indexes has consistently been under threat with the result that the index of the volume of food production in South Africa as increased from 54,6 in 1974 to 109,8 in 2007 (Abstract, 2008). As the basic production resource (land) has remained constant this is a clear proxy of efficiency gains in the Sector.

13. How does one then explain that, during the first three months of 2008, the international nominal prices of all major food commodities reached their highest level in 50 years and real prices (i.e. – inflation taken into account) were the highest in nearly 30 years? (See Figure 3) These high levels is the result of an eight percent increase in the food price index

during 2006, followed by another 24 percent in 2007 and, during the first three months of 2008, it rose by a mighty 53 percent compared to the same period in 2007. This trend was led by sharp increases in the price of vegetable oils which increased by 97 percent over the same period, followed by grains (87%), dairy products (58%) and rice (46%) (FAO, 2008).

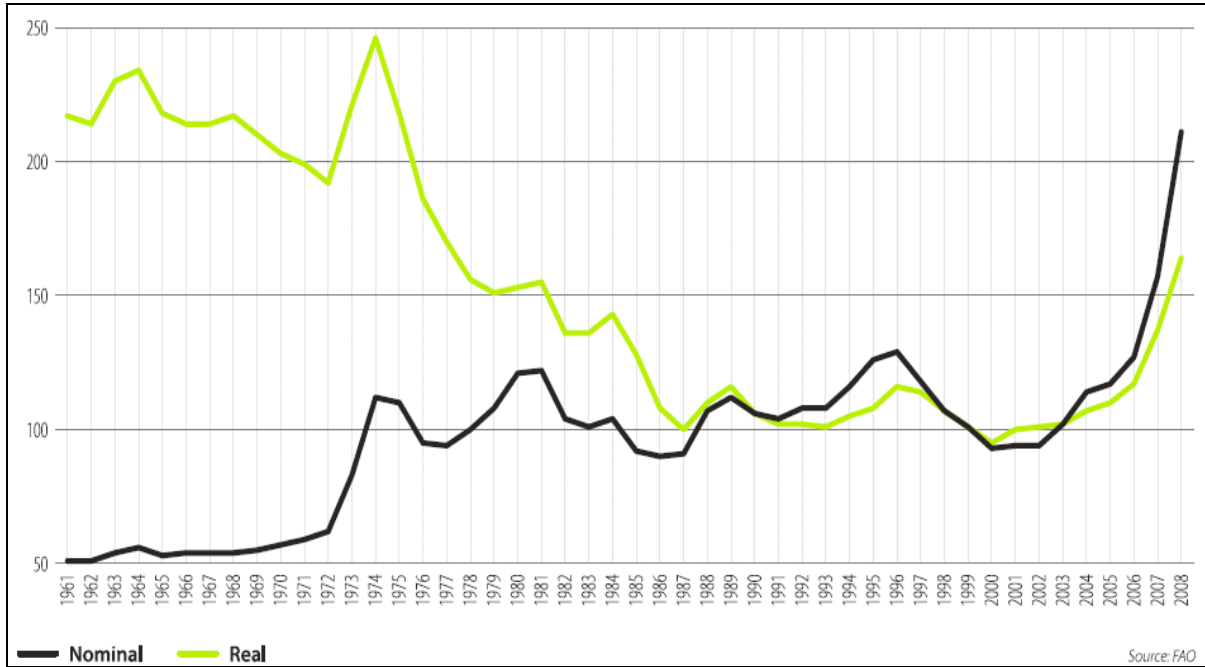


Figure 3: Global Price Index of food (1998 – 2000 = 100).

Source: FAO (2008)

14. Although the reasons for the recent increase in the price of food are a topic for another debate that cannot be fully addressed in this paper, the answer to this abnormality can be found in a combination of:

- a) The general rise in the prices of all commodities (i.e. oil, gold, etc.) that influenced investor and speculator decisions.
- b) Alternative uses found for agricultural commodities (i.e. biofuels).
- c) The impact of government policies (i.e. set-aside programmes and trade restrictions).
- d) Adverse climatic conditions that depleted stocks of commodities.
- e) Rapid economic growth combined with changes in consumption patterns in the developing world (and especially China and India).

15. Nevertheless, for the purpose of this paper it is important to take note of the changes in commodity prices that occurred subsequent to its highest levels. According to the overview of the price movements of some of the most prominent commodities provided in Table 2 it is clear that the prices of most grains and dairy products declined by more than fifty percent since its highest levels. The change in the price of meat products was more moderate with changes ranging between eighteen and forty-seven percent.

Table 2: Changes in the prices of selected agricultural commodities from its highest level in 2007/2008 to its current level.

Product	Highest price / Ton 2007/08	Lowest price / Ton 2009	% Change
Maize (US No2 Yellow)	\$303	\$140	-54%
Wheat (US No2 Hard Red Winter)	\$510	\$220	-57%
Rice (Thai, White)	\$1 038	\$543	-48%
Butter	\$4 150	\$1 850	-55%
Cheddar Cheese	\$5 500	\$2 450	-55%
Skim Milk Powder	\$5 150	\$1 750	-66%
Whole Milk Powder	\$4 950	\$1 850	-63%
Bovine (US Export Beef)	\$5 114	\$3 778	-26%
Pig Meat (USA Frozen Pork)	\$3 249	\$2 006	-38%
Poultry (Brazil Export)	\$2 139	\$1 124	-47%
Poultry (US Broilers Export)	\$1 089	\$898	-18%

Source: FAO (2009)

16. It is now appropriate to turn to finding a solution to this treadmill which farmers in the Agricultural Sector face. The first potential solution, developing an additional use for the specific commodity, is graphically represented in Figure 4. According to this approach the additional demand (for instance, the demand for maize as a feedstock in the newly created biofuels industry) would move the demand function of our product from D_0 to D_1 . The result would be that the price will increase from P_0 to P_1 and the quantity demanded from Q_0 to Q_1 .

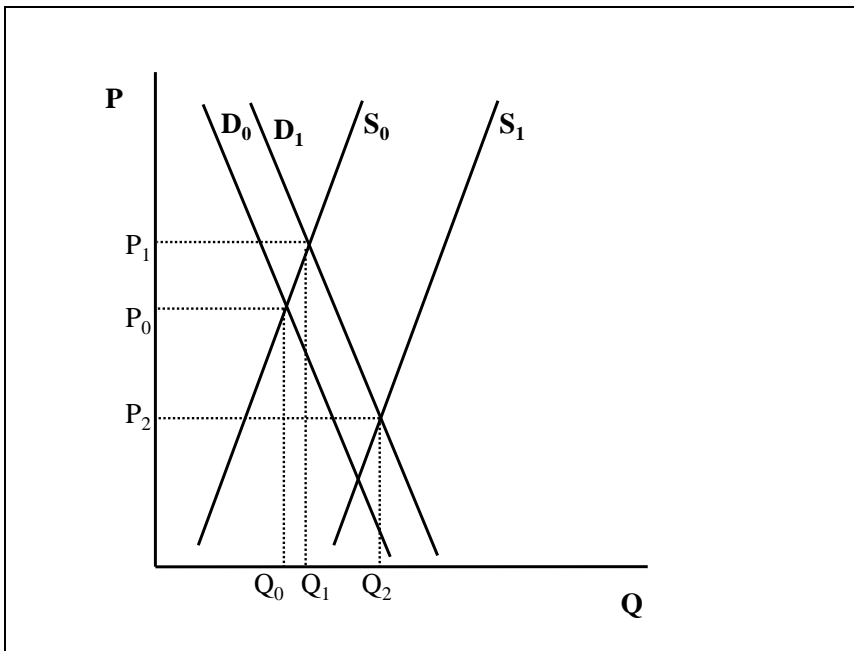


Figure 4: Solution to the farm problem: move the demand function.

17. However, one could expect that producers would react to this increase in the price of the commodity. One reaction that is currently being experienced is that new land is being cleared for the production of feedstock for the biofuels industry and, due to the higher price, another reaction is that marginal land is being brought into production. The result would be that the supply function will move to the right (from S_0 to S_1) and that the price of our commodity would actually decline to P_2 albeit the higher quantity of Q_2 .

18. The second potential solution would be to change the slope of the demand function or, in other words, to re-focus the product on a different segment of the market. This is not as easy as it sounds. In selecting a different market the producer of agricultural products is faced with a totally new demand function with new characteristics, opportunities and means of market penetration. The effect of such a situation on the prices of agricultural products is illustrated in Figure 5. Over time the demand function would still move to the right (change in population, income, etc.) from D_0 to D_1 and the supply function would move from S_0 to S_1 . However, this movement of the supply and demand functions will lead to upwards pressure on the prices of the specific product from P_0 to P_1 .

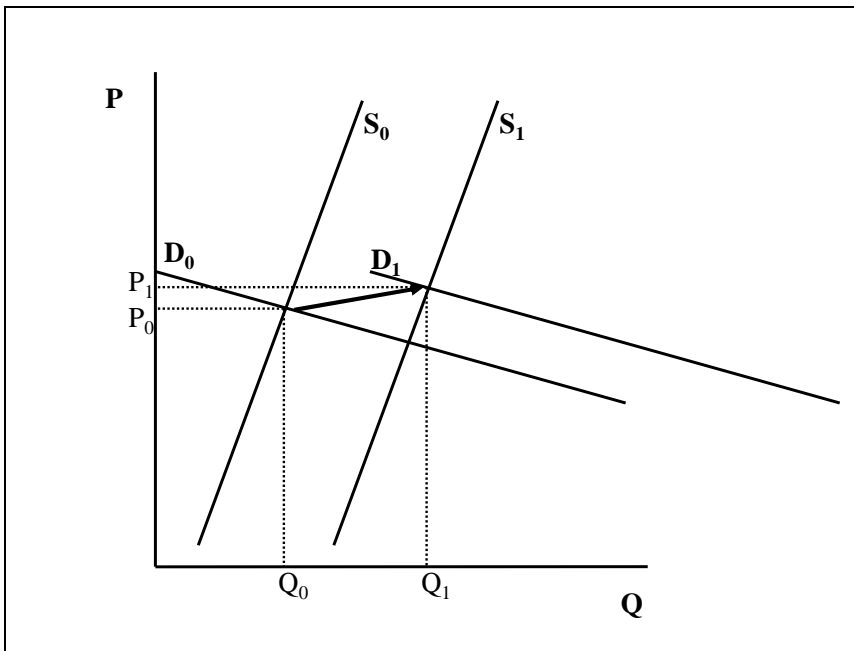


Figure 5: Solution to the farm problem: change the slope of the demand function.

19. This category of products is typically your differentiated, value added or luxury products. Price usually becomes a less important product characteristic and other attributes, such as non-tangible characteristics and the transformation of the product usually plays a more important role. An added benefit is that an agricultural product with a more elastic price elasticity of demand usually tends to have a higher income elasticity of demand. The income elasticity of demand is typically measured as the average for a specific product while the wide variety in quality and therefore prices within the product group is ignored. An increase in the income within a population would normally lead to a greater than proportionate increase in the expenditure on the higher quality products. Within a product group the income elasticity of demand therefore tends to be higher for the higher quality or differentiated part of the product group than for the bulk or so-called commodity part of the product group.

20. Nevertheless, it is important to provide one word of caution. It is illustrated in Figure 6 that the price elasticity of demand is very seldom constant across the entire demand function. The demand function usually consists out of certain segments that are more elastic and other parts that are more inelastic. It follows that, once supply is allowed to move out of the relatively elastic part of the function, the typical problems associated with the inelastic demand of agricultural commodities are encountered again. An excellent example of a product that moved from the elastic part of the demand curve into the inelastic part of the demand curve is provided by the global increase in the production of Kiwifruit. It is not that an overproduction of Kiwifruit developed, but rather that the demand function its producers face moved from the elastic part into the more inelastic part of the function. The speed with which the inelastic part of the demand function is reached is usually exacerbated by the prevalence of imitations or similar products. It is for this reason that it is often proclaimed that “Reputation without protection is a recipe ripe for disaster”.

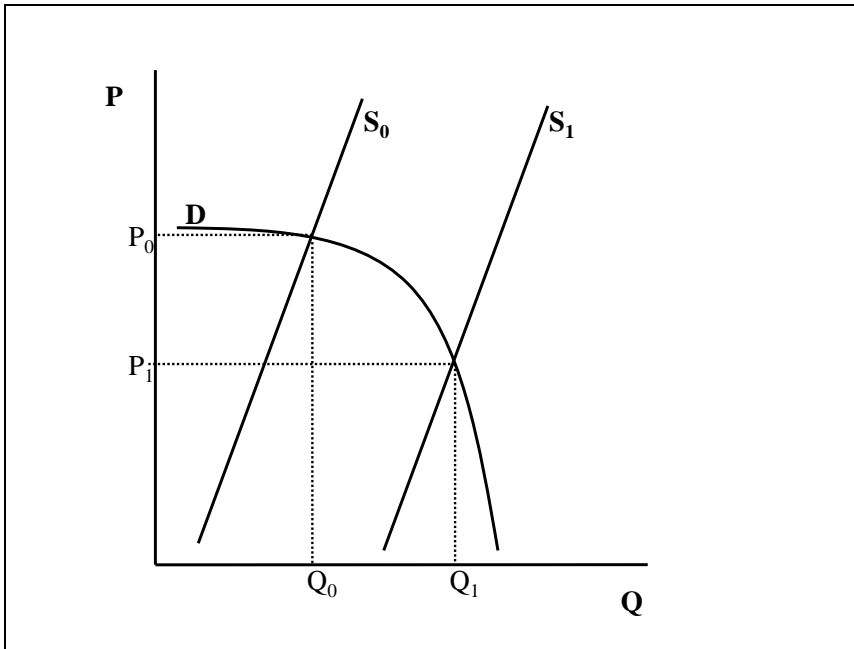


Figure 6: Elasticity of demand is seldom constant over the entire demand function.

21. One final consideration in this part of the paper, and of special relevance to conditions in developing countries, is the possible effect of product differentiation on the affordability and availability of food to the poor in society. It is clear from the discussion that the objective of the product differentiation is to increase the stability and level of the price of agricultural products. What then of food security? The answer to this question is twofold. In the first instance it must be kept in mind that in all probability only a fraction of the produce can be differentiated through the proposed means. It follows that the net effect on food security will be close to zero. The second statement is that lucky is the region that exports high value and value added agricultural products while importing cheap agricultural commodities.

22. This then provides a very sound argument for not only the limitation of the supply of a product, but also the need to prevent imitations of the differentiated product to reach the market. In the next part of the paper some of these issues will be discussed with the aid of a uniquely South African example.

III. FROM THEORY TO PRACTICE: KAROO LAMB

A quick Google-scan of the term “Karoo” result in some interesting hits:

- a) “Karoo Cuisine” – Pre-prepared meals, ready to be micro waved, from a factory in the Gauteng Province of South Africa (outside the Karoo).
- b) “Karoo Natural Spring Mineral Water” – Bottled water from the Bergriver (outside the Karoo)

- c) “Karoo” – The local portal for Hull and East Yorkshire in the UK – definitely outside the Karoo.
- d) “Karoo design and advertising” – An advertising agency with offices in Southampton and London.
- e) “Karoo Tire” – Motorcycle off-road tyres from the United States.
- f) “karoo.co.uk” – provider of broadband in the UK.

23. It is clear that the word “Karoo” is quickly becoming an international word. Nevertheless, the word “Karoo” originates from the word “Karro”, meaning “hard and dry” in the Khoi language of Southern Africa. The Khoi is indigenous to the area currently known as the Karoo and they are one of the oldest people on earth.

24. So, why does the word “Karoo” attract so much interest? In order to answer this question one must go back in history – back in time past the relatively juvenile dinosaurs; to about 450 million years ago. At that stage in the history of the earth rifting in the crust across what is today the Southern Cape part of South Africa resulted in an inland sea with associated sedimentation. A few million years later (310 million years ago), a subduction zone developed which lifted the sedimentary area into a massive mountain range (similar in magnificence of the current Himalaya Mountains and to the way it was formed). The tectonic movements resulted in a depression to the north of this mountain range into which mighty rivers fed. These rivers eroded the mountains over millions of years with the result that the new depression was, in turn, filled with sediments. This translated into extensive swamps, delta-rivers and massive flood plains.

25. In this area a unique collection of fauna and flora developed with various forms of reptiles filling the ecological niches created. Some of the reptiles eventually developed into mammalian-like reptiles and the first vestiges of a mothering-instinct can be found. However, 251 million years ago the biggest of all mass extinctions that the earth ever experienced occurred and more than 96% of all plant and animal species became extinct. From the few surviving species the dinosaurs evolved 50 million years later, only to fall victim of another mass extinction 65 million years ago (McCarthy & Rubidge, 2005)

26. Nevertheless, these processes of erosion and sedimentation that gave birth to an exceptional fauna and flora also resulted in a unique geological environment today. The sedimentary rocks can literally be observed as layers with, if explored at the right place, the most magnificent fossils waiting to be exposed. The geology, combined with the current semi-arid climate, again gave rise to a unique plant kingdom. These plants, in turn, result in a very specific taste being transferred to mutton from the area.

27. The uniqueness of the relationship between the geological environment, climate and the attributes of domesticated animals was tested in a collaborative research project (see Kirsten *et al*, 2008 for a detailed description of the methodology and the research followed). During this research project a number of plants uniquely endemic to the Karoo and, according to folklore, responsible for the unique taste of mutton from the area, were identified by veldt scientists from the Northern Cape Department of Agriculture. These plants are *Plinthus karrooicus* (“Silverkaroo”), *Pentzia spinescens* (“Skaapbossie”), *Eriocephalus ericoides* (“Kapokbossie”), *Salsola glabrescens* (“Rivierganna”), *Pentzia incana* (“Ankerkaroo”) and *Pieronia glauca / rosenia humilis* (“Perdebos”). The noticeable contribution of these plants to the taste characteristics of Karoo Lamb were put to the test by sourcing samples of mutton from three different areas in the Karoo as well as two areas outside the Karoo. A panel of tasters was selected, trained and calibrated to assess the flavour, texture and attributes of the mutton from the area. It was found that the sensory profiles of mutton from the Karoo region exhibits characteristics that can be traced back only to the unique grazing plants in the Karoo.

28. Once it was established that there is substance in the folklore of a perceptible difference between mutton from the Karoo and mutton from other areas, the sensory analysis was followed by a consumer perception survey. The survey was conducted amongst higher income consumers in two urban areas of which one (Gauteng) is the main economic hub of the country and the other (Cape Town) is the closest urban centre to the Karoo. A more detailed description of the research methodology and the results can be found in Kirsten *et al* (2008). For the purpose of this paper some of the most important results can be summarised as follows:

- a) 63% of consumers aware of Karoo Lamb perceived it as having a different taste from ordinary lamb.
- b) 53% of consumers aware of Karoo Lamb perceived it as having a different aroma from ordinary lamb.
- c) 45% of consumers aware of Karoo Lamb perceived it as being a traditional food type.
- d) 68% of consumers aware of Karoo Lamb are willing to purchase it if it was available as a product.
- e) 21% of consumers stated a preference for Karoo Lamb.
- f) 27% of consumers aware of Karoo Lamb indicated a willingness to pay a premium for it.
- g) 43% of consumers aware of Karoo Lamb perceived it to have a better taste.
- h) 34% of consumers aware of Karoo Lamb perceived it to have a better aroma.

29. It is clear that the Karoo region has a singular history, its products carries unique attributes and that these attributes are valued by a significant number of consumers. However, a significant problem encountered is the lack of an organisation that can take ownership of the attributes embedded in the Karoo name. At a political level the area identified as the Karoo encompass four of the nine provinces of South Africa and 39 of the districts and municipalities in the country. As most non-governmental or industry specific organisations in South Africa is structured according to political boundaries, there is currently not a non-governmental or commodity organisation that could take ownership of this valuable asset. The result is that the development of such an organisation entails a whole new challenge to be faced and an interesting New Institutional Economics research problem.

IV. CONCLUSION

30. In the first part of this paper the economic rationale behind product differentiation was investigated. It was found that commodity producers in the Agricultural Sector are faced with a specific set of circumstance flowing from the particular price elasticity of both the supply and demand functions for agricultural commodities. These specific set of circumstances leads to downwards pressure on the prices of agricultural commodities and to a phenomenon known as the Treadmill Theory. A number of interventions are possible to address the Treadmill, but care must be taken that subsequent commoditisation of niche products does not undermine the original intention.

31. The information presented in the case study indicates that the Karoo is a very unique region with a historical perspective that goes back hundreds of millions of years. This history, embedded in layers of sedimentary rock, can be unveiled like peeling an onion and give rise to a very unique set of attributes detectable in Karoo lamb. Nevertheless, as there is a real danger that the value of these attributes can be usurped and debased, the need for the protection of the integrity of the embedded values arises. As a significant number of consumers are aware of these attributes, the Karoo “image” can actually be used in promoting products from the area. However, for the products from the Karoo region to uncover its true niche properties some dedicated promotional initiatives are necessary. Furthermore, given the large proportion of South African sheep meat being produced in the Karoo and the extent to which usurpation of the Karoo name are already taking place on an national and international level, it is becoming increasingly critical important that steps be taken by the people of the Karoo to take ownership of the values embedded in the Karoo name. It is important to note that these steps should not be delayed by the lack of any specific system in the South African context (or stalemates at international forums), but the people of the Karoo should use systems that does exist to protect their own. The current lack of collective ownership and protection of the Karoo name is in itself a problem that can well be researched from a New Institutional Economics perspective.

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