



Nature's Bounty

The Nethergill Axioms Issue 02

Note 15 October 2020

Hill Farming Model

1. Profitability changes when the *grass runs out*
 - a. Improving productivity through intensification practices stops at this point
 - b. Beyond this point growth in terms of absolute output [£] is driven by acreage
 - c. The availability and quality of grass is determined by latitude, elevation and rainfall
2. Variable production costs fall into two mutually exclusive classes:
 - a. Productive (PVCs): Working with *Nature*
 - b. Corrective (CVCs): Substituting for *Nature*
3. If revenues (before support payments) cannot cover PVCs the farm business is *intrinsically* un-viable: cash losses increase with output volumes
4. When fixed costs are greater than 40% of revenues (before support payments) there is a 90%+ probability that the farm business will be unprofitable (before support payments)
5. The onset-point of CVCs is also the point of maximum sustainable output (MSO). Beyond this point *Nature* is not capable of natural replenishment without external help
6. At the MSO point:
 - a. Profitability (expressed as profits as a % revenues) is maximised (or losses are minimised)
 - b. The contribution made by “free-issue” natural resources (such as grass) is also maximised
 - c. Profits at MSO (absolute [£] and after support payments) measure the maximum benefit of natural resources
 - i. *Natural Capital* is therefore the capital sum that can produce a net revenue equivalent to the profits at MSO (on the basis of prevailing interest rates)
7. When Natural Capital is maximised at MSO so its inverse must be minimised
 - a. *Environmental Stress* is the inverse of *Natural Capital*
 - b. Mathematically, $ESI = f(1/\text{Natural Capital})$ where ESI is an environmental stress index
8. In a managed landscape the benefit of *Natural Capital* at zero output is equivalent to $NCo = (\text{Support Payments} - \text{Fixed Costs})$
 - a. When NCo is positive the ESI is positive

- b. When NCo is negative the ESI is negative (mathematically: an *imaginary* number)
- 9. The components of CVCs have no physical utility unless commercial pricing (which fails to account for full system costs) forces consideration
 - a. To do so otherwise violates the 2nd law of thermodynamics
 - b. Substituting for *Nature* is a ***dead-end stratagem***- but climate management (eg greenhouses) is not so constrained
- 10. When *Nature* provides commodities such as grass (as “free-issue” items in industrial terms) it acts as a stakeholder in the farm business
 - a. As a stakeholder it should rank with traditional shareholders (owners, investors, and subscribers): Therefore it is a ***liability*** on the business balance-sheet
 - b. As it behaves in a sense that is diametrically opposite to that of a traditional shareholder (it provides a benefit in the form of avoided costs as opposed to demanding a dividend to compensate for capital at risk) it is therefore a ***negative liability***

Nethergill Associates