CAP ANALYTICS: Quotas; Co-responsibility Levies; MacSharry & Set-aside.

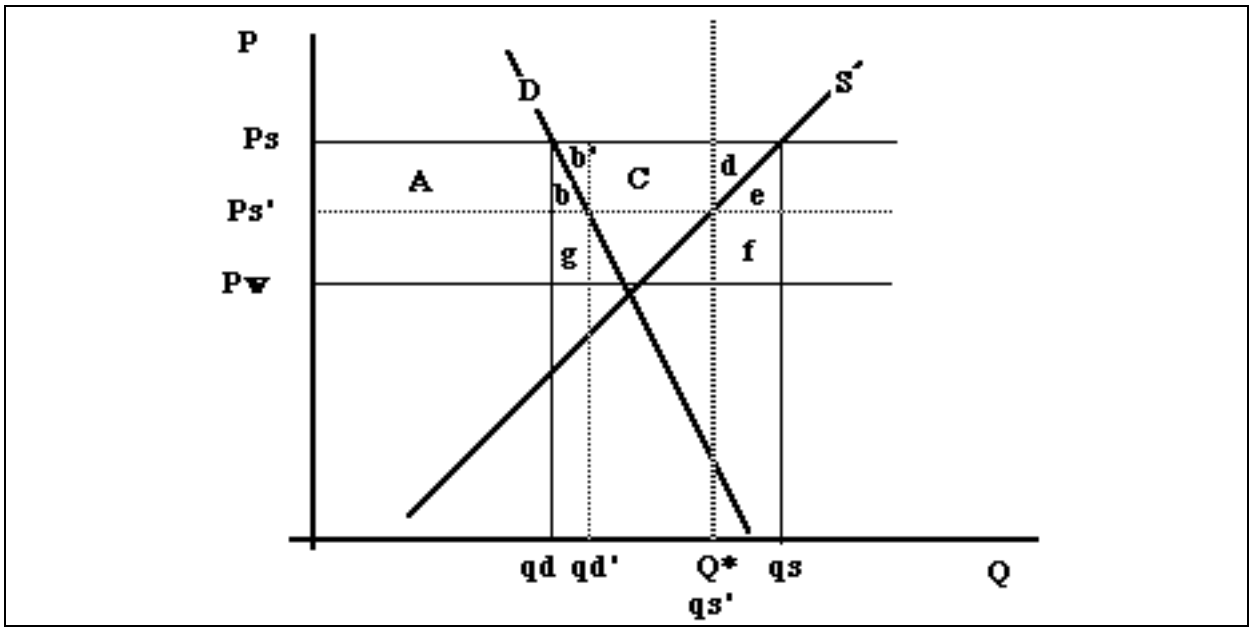
1. Quotas

Until the MacSharry reform package of 1992, quotas, as limits on production at the farm level, appeared to be the only politically acceptable alternative to price reductions to achieve market balance (within the EC) at the same time as limiting budgetary spending and preserving most farmers incomes. In that sense, they were inevitable, at least for milk (why for milk rather than cereals?). The usual textbook economic analysis considers quotas against the alternative of a freely competitive market and concludes that quotas:

a) force up consumer prices;
b) create rents for the owners of the quota;
c) produce queues of unsatisfied producers who would like to produce more at the quota supported price;
d) results in a loss of economic welfare, and results in a significant transfer from consumers to producers (as quota owners);
e) creates problems as the industry tries to adjust to changing circumstances (ie shifts within and of the supply curve) - which can be overcome to some extent through trade in quotas themselves.

However, in comparison with a situation of unlimited support at a target or guaranteed price above the market price (the EC situation prior to quotas), the story is rather different.

Figure 1. The Simple Analytics of Quotas:



Ps is support price before quotas. **Pw** is current world price, assumed unchanged whatever EC does. **qs** and **qd** are quantities supplied and demanded at current support prices. Hence current cost of surplus disposal is (Ps-Pw)*(qs-qd), which is too big and growing too fast as S shifts right due to technological and structural change (*review your understanding of what these phrases mean).*

Solutions	Price reduction - Ps to Ps'	Quotas Imposed at Q*
Producers' Loss	A+b+b'+C+d	d
Consumers' Gain	A+b	nil
Taxpayers Gain	C+d+e+f+b'+b+g	d+e+f
Net Welfare Gain:	e+f+b+g	e+f

(note: imposition of a production (sales) quota at Q* results in production level which could be achieved by an EQUIVALENT price reduction from Ps to Ps', though maintains the actual support price at Ps)

Conclusions: - think about what these are before reading on!

CAP ANALYTICS: Quotas; Co-responsibility Levies; MacSharry & Set-aside.

Conclusions of Quota Analytics:

1. Price reductions are more efficient (smaller welfare cost) by amount (b+g) but given very low elasticity of demand for milk and products, this is likely to be small;
2. Producers' Loss is much smaller under quotas;
3. Tax savings almost the same (smaller by (b'+b+g) which is small if e(d) is low;
4. Necessity for continual price reductions as supply shifts right avoided by quotas.

Extensions and questions:

Use quotas as means of progressively reducing support - set Q* equal to qs, make freely tradeable and buy in quota to reduce quantity supplied until surplus is eliminated. How much would this cost? *(What price would you expect quotas to trade at?)*

What about the effects on world prices for milk (products)? What might be the effects of a change from open-ended support on world prices and hence on the budgetary cost of the support policy?

What about the distributional aspects of quota imposition? Who is likely to gain and who is likely to lose?

Under what conditions could quotas be eliminated and what would be the effects of getting rid of milk quotas?

How could the EU apply supply control (quotas) to, eg. the cereals sector, and what would be the effects?

2. Co-responsibility Levies (taken from Hubbard, 1986)

Introduced to try and stem budgetary spending on the CAP by taxing producers on the basis of their production. Why are Co-responsibility levies (taxes on production) a better way of achieving this objective than the equivalent price reduction? (Try and answer this question before reading further)

Figure 2 Co-Responsibility Levies

(a) without increase in support price (b) with increase in support price

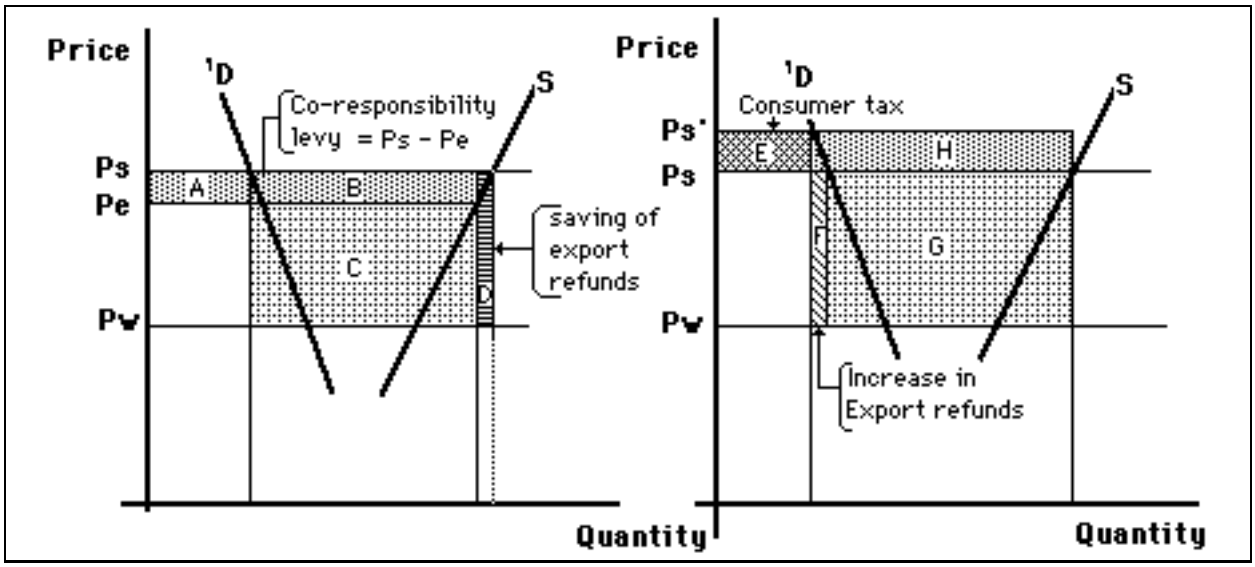


Figure 2 shows the basic analysis of the co-responsibility levy. As a tax (% of support or market price) paid in the first instance by producers, it reduces the effective support price at the farm gate from **Ps** to **Pe** (Figure 2(a)), thus reducing the quantity supplied and saving export refunds by area D. It reduces the total net expenditure on export refunds by FEOGA

(the EU CAP budget) from B+C+D to C, where B is the farmers' contribution to surplus disposal costs. In addition, it contributes area A to the FEOGA account, as the co-responsibility levy on sales to the domestic market. Consumers are unaffected by the co-responsibility levy in this case, still paying **Ps** for the commodity.

Co-responsibility levies are seen as a good thing for the EC Budget because:

•. they 'save' more than the equivalent price reduction (from Ps to Pe) by area A, which will be quite large since domestic consumption is typically about 80% of production (cereals and milk). In this sense, co-responsibility levies become a tax on consumers, who still pay Ps but contribute A to the EC budget. [Note, the savings on export refunds are slightly larger for price reductions than co-responsibility levies. However: note the administrative point, not unimportant, that area B is treated as FEOGA income - to be used by CAP programmes - rather than simply savings in spending]

and by politicians because:

- unlike price reductions, the smallest producers, or those in LFAs, can be exempted from paying, so that they still receive Ps rather than Pe. [Note: because of this the diagram is a simplification, supply will not be reduced by quite as much as shown here, since some producers do not pay the tax. However, because these are typically the smaller farmers, the simplification is not likely to be substantial unless exemptions rise to a substantial proportion of total production]

and by farmers because:

- they appear to place some of the cost of surplus disposal on the farmers themselves, which can be helpful in overcoming resistance and opposition to the CAP by consumers and taxpayers.

However, Hubbard points out the serious possibility that agricultural ministers set both the rate of the co-responsibility tax and the support price, and that they consider the net price received by farmers as the crucial price. Thus, there is a strong possibility that imposition of a co-responsibility tax will be offset by an increase in the basic support price.

In this case, the analysis is as in Figure 2(b). The support price is raised to **Ps'**, the difference between **Ps'** and **Ps** being the co-responsibility levy. Now, area E is quite clearly a consumer tax, not a producer tax, since the producers' price is unchanged. Taxpayers, responsible for the costs of removing the surplus, bear a net cost of surplus disposal of G, H being paid by producers to offset the same area of additional tax spending with support price at Ps'. In fact, because the consumer price is raised from Ps to Ps' to pay the levy, consumption will fall and the surplus will tend to increase, thus increasing the disposal cost by area F (though given typically inelastic demand curves, this increase is likely to be small). Taxpayers are better off with the levy than without it by area A (large) - area F (small), while consumers are worse off by area A. Producers position is unchanged in this case. Thus if support prices are simply raised to offset the introduction and effect of the levy, then all the levy does is to shift part of the burden from the taxpayer to the consumer. Hubbard looks at the history of levies and support price changes in the milk sector over the period 77/78 to 83/84 and concludes that history, at least, demonstrates that ministers do tend to increase support prices so as to offset the co-responsibility levy.

References

Harvey, D.R., 1985, *Milk Quotas: Freedom or Serfdom?*, CAS Study 1, Centre for Agricultural Strategy, Reading University & Knight, Frank & Rutley.

Hubbard, L.J. & Harvey, D.R. (1988): "Limited Support Payments: an option for the EC Cereal Regime", *Discussion Paper DP 4/88*, Department of Agricultural Economics and Food Marketing, The University, Newcastle upon Tyne.

Hubbard, L.J., 1986, "The co-responsibility levy - a misnomer?" *Food Policy*, **11**, (3) August, 197 - 201.

3. Set-Aside

This is a complicated issue for graphical analysis, pushing the boundaries of the capacity of simple economics (and economists) to cope with. However, there are some fairly obvious points to make about set-aside.

It is not strictly necessary for supply control, **so long as** the reduction in support price is enough to make internal EU prices close to the world free trade price for cereals, and **so long as** the compsation payments do not continue the previous encouragement to produce more than would be produced at this free trade price. However, if neither of these conditions are met, then set-aside will be necessary to reduce the supply. The price reduction under MacSharry could be argued to be somewhat above the free-trade world price, though the Commission argued that 100 ecu per tonne was close to the long run free trade world price. The compensation payments (based on area) however, are not de-coupled.

Otherwise, the adoption of set-aside can be seen as a response to the following policy pressures:

- a reflection of the EU's internal need for a reduction in over-supply, coupled with a reluctance on the part of policy makers to believe that supply curves slope upwards, and thus that price reductions would not actually encourage increases, rather than reductions, in supply (there is **no** credible or reliable evidence that this is the case).
- a 'downpayment' in the GATT negotiations, signalling the intent of the EU to assist in the strengthening of world markets - through explicit limitation of supply and hence subsidised exports.
- an imitation of the US policy, hence more likely to eventually agreed to in the GATT Uruguay Round.

Nevertheless, the effects of set-aside and area control (coupled with area payments) are problematic.

First, the effects of the price reduction on EU supplies would be muted because of the area payments - the same amount of land as before would still be devoted to cereal production, since the payments depend on the area. Since most supply response is likely to result in changes in areas of land devoted to crops at the margin, rather than changes in variable inputs affecting the yields per ha., the supply curve against which the market price reductions would have an effect would be steeper (more inelastic) than if the payments were independent of land.

Second, conversion of a price reduction per tonne to an area payment (for both set-aside and compensation area payments) requires the use of an average yield per ha. Those farmers with greater than average yield would be penalised compared with those with lower than average yields. (Some regional and, especially, national variations in the yield levels were allowed to cope with this).

Third, imposing the set-aside restriction on cereal farmers must raise their costs of growing cereals compared with no restriction - since they are now obliged to use more land that otherwise to produce a given amount of cereals. This observation indicates that we might analyse the consequences of set-aside by shifting the supply curve of cereals upwards. However, we are coupling set-aside with area payments, so the analysis is not so straightforward (see Appendix to these notes). Previous attempts to control cereal production by offering farmers the option of volunteering to set-aside some of their land in return for a set-aside payment has demonstrated that quite high compensation payments were required to persuade farmers to give up growing cereals (as would be expected if prices of cereals were kept high). It is these costs which can be expected to generate considerable antagonism amongst commercial cereal farmers - who are being told on the one hand to become more competitive, and on the other are being restricted as to what they can do.

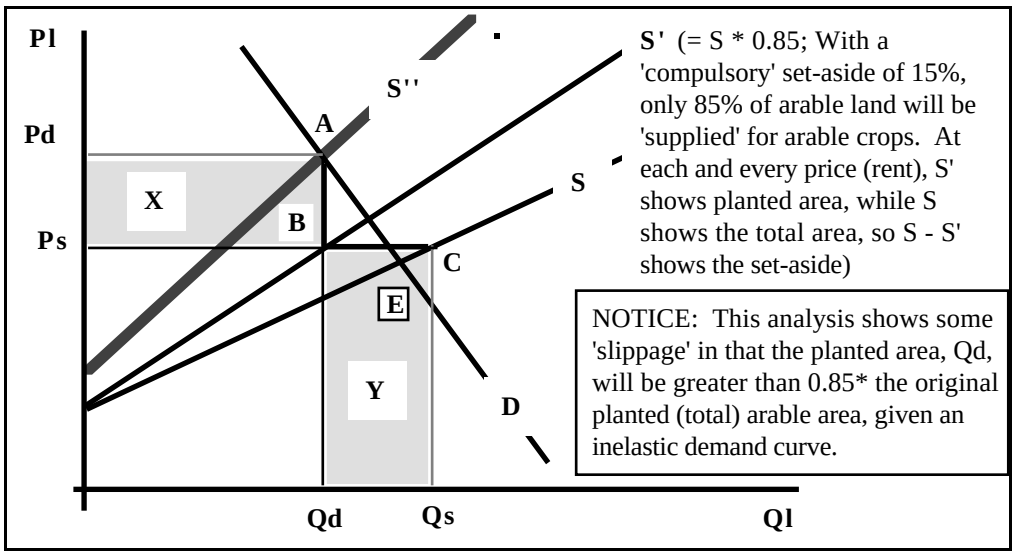
In the long run, however, the costs of set-aside may well become incorporated in the value of cereal land. In effect, the set-aside requirement now means that more land is required to grow

cereals than before, and we would expect farms to adjust in size to take account of this added requirement for land - so cereal farms will tend to become larger. As they do, so the price of cereal land will tend to increase, reflecting the added demand for cereal land. Thus, the cost increase associated with set-aside will be reflected in the value of cereal land, paid by new entrants but adding to the wealth of existing owners - an example of intervention raising the costs of production while simultaneously increasing the value of the fixed assets in the industry.

Appendix: Set-Aside and Land Prices

Allan Swinbank, 1994, suggests the following analysis of the effects of set-aside on land prices (rents). The basic proposition is that the higher the level of price support, the higher the level of land prices (see Harvey, 1989)

Figure 1: Demand & Supply of Arable Land



1. Without set-aside, the equilibrium demand and supply for arable land will be at point E, where the rent earned by land in arable production (from the demand curve) is equal to the rents to be earned by this land in the next best alternative use, from the supply curve.

2. Now consider a 'compulsory' set-aside programme, where in order to plant any given area, a fraction must be set-aside. Now, there is a second 'supply' curve which shows the amount which can be planted (shown here as **S'**) given that x% must be set-aside of the total area **S** - so that area **Qd** is planted of a total area of **Qs**, with the difference being set-aside, at price **Ps**

3. With this set-aside policy in place, the rent which is now earned by land in production (planted) given by the Demand curve at any quantity as **Pd** * **Qd**, must be enough to attract this land **and** the necessary set-aside area from its other uses, given by the supply curve as **Ps** * **Qs**.

Thus, there is another curve (S'') which lies above S' showing this necessary relationship between S and Cereal land Rents (S''). This curve S'' shows:

- **the <u>Pd/Qd combination</u> such that the associated Ps (from S') / Qs (from S) combination satisfies the condition that Pd*Qd = Ps*Qs.** (Conceptually, imagine moving the right angle of lines **BC** & **BA** above up the S' curve, holding the point of intersection, **B**, on the S' line, while adjusting the lengths of **BC** and **BA** such that: i) **C** remains on the **S** curve; ii) **BA** is sufficient to maintain the equality of areas **X** and **Y** shown on the diagram. The resulting plot of points **A** traces out the **S''** curve).

Thus, in the diagram, with set-aside condition shown by S', the equilibrium will be at points A,B,C. (where A and B lie on a RECTANGULAR HYPERBOLA - a curve with Elasticity = 1 (Unitary elastic).

4. **Hence**, whatever D looks like, the Demand Rent (Pd) is *increased by set-aside*, which means the planted land HAS to produce a greater rent with set-aside than without it. Does this mean it will be farmed more intensively? Not necessarily, see below.

5. If D is unitary elastic, C and E will coincide - set-aside will NOT alter either the total arable area OR the supply rent for arable land - since land will not switch into or out of arable use, the opportunity cost of arable land in its next best alternative will not change.

If, However, D is inelastic, as shown here, then C lies above and to the right of E, meaning that *land will move into arable from other uses*, hence increasing the supply rent (opportunity cost) of arable land - (*Vice versa* if demand for arable land is elastic.)

6. What can we say about how elastic or inelastic Demand for arable land is likely to be??

Elasticity of demand for arable land

In the long run, when all other inputs and factors are adjusted fully to changed areas of land employed in arable production, the only reasons why the demand curve for arable land should slope downwards are:

- greater areas of land used mean more production which leads to lower cereal prices (either a closed market or large open one);
- greater use of inputs and other factors causes their prices to rise (which implies fixed factors specific to arable production chain somewhere in the system);
- heterogeneity of land, such that increased areas in arable mean inherently less suitable land is used.

Only the last of these reasons applies whatever the level of the analysis (farm, region, country or EU), and seem likely to dominate the reasons at the regional and probably too the national level.

MOVEMENTS UP THIS DEMAND CURVE FOR ARABLE LAND DO NOT IMPLY GREATER INTENSITY OF USE OF LAND, MERELY THAT THE PROPORTION OF REVENUE EARNED FROM GRAIN PRODUCTION WHICH ACCRUES TO LAND WILL INCREASE. This contradicts Swinbank's paper - which is based on the more common case where land is considered a fixed factor and addition of more inputs, producing more output, increases the marginal product of the fixed factor and hence its return (rent). In this case, however, the analysis presumes land to be a variable factor, otherwise we could not draw the diagram! Thus, we are considering here the case of the long run, where all factors and inputs are considered variable. However, in a special 'short-run' case (at the farm level, for instance) where other factors (especially labour, capital equipment and management) are considered fixed while the land is considered variable, reductions in land input to cereal production will increase the land's marginal productivity, and hence its rent - but this does not necessarily imply greater use of other variable inputs (fertilisers, pesticides etc.) on this reduced land area. In fact, since the optimal application of these variable inputs depends on their relative productivities per hectare, changing the total hectares (size) of the operation should not (I think) change the application rates per hectare at all, unless either the price of output or the costs per unit of other inputs change.

Best arable land will be used first and will earn highest rents in arable production. As we increase the arable areas, so less suitable arable land will be used and will earn lower rents. The elasticity of demand will therefore depend on the relative suitabilities of land to arable production as we increase the area of land devoted to arable.

On grade 1 & 2 land, we might expect the demand for arable land to be rather elastic at current arable areas, since the balance between arable and other uses is unlikely to heavily influenced by the quality/capability of the land, and hence any modest change in areas devoted to arable will not have a substantial effect on the rents to earned (other things being equal).

However, if we are currently using virtually all the good grade land for arable, then the demand will be inelastic, since any attempt to increase the area will involve use of less suitable land and lower rents from arable production. Typically, this may well be the case at most levels of analysis (farm, regional, national).

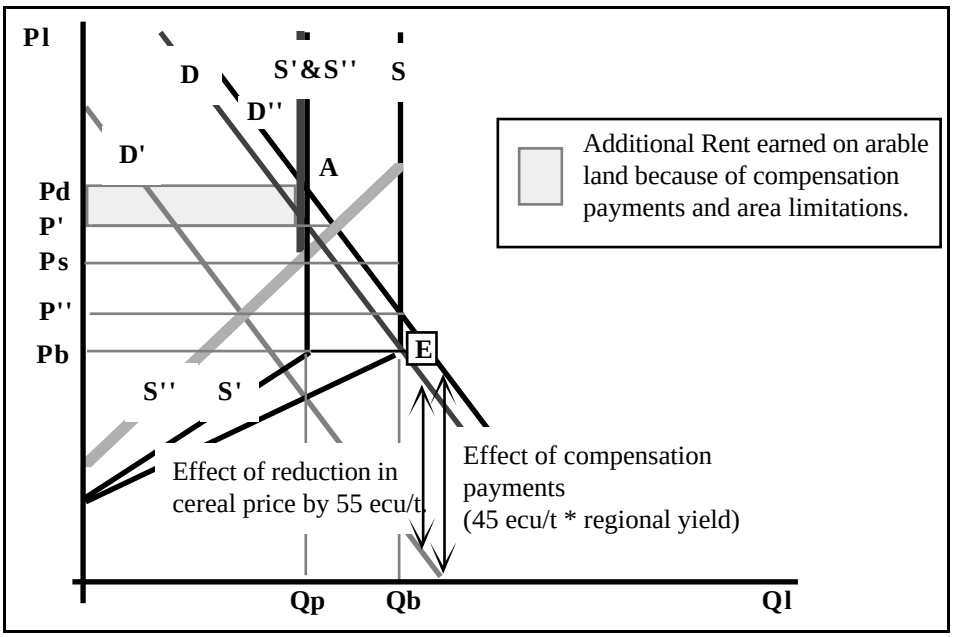
8. Effects of the Mac Sharry Reform

NOTICE, Mac Sharry reforms involved **a reduction in cereal prices** (by 30% approx.) plus **compensation payments** on both planted and set-aside land. What does this do to the analysis?

Price reductions (55 ecu/tonne) shift D to left. Compensation payments (45 ecu/tonne) shift it back to the right. BUT notice, the price reductions reduce the earnings of all inputs and factors into cereal production, while the offsetting compensation is "earned" on a per hectare basis - only dependent on the land area used for arable (production plus set-aside). So, the final net shift of D is more likely to be to the Right increasing the rents and intended land use for arable.

However, Compensation payments are limited to pre Mac Sharry arable land areas, so NO increase in overall arable area is permitted - at least to receive the compensation payments. Hence, the demanded quantity will reflect this upper limit on arable land areas at farm, regional and national levels.

Figure 2: Mac Sharry Application



Thus, the post Mac Sharry diagrammatic analysis would appear to be as shown above (Figure 2). The **S**, **S'** and **S''** curves are now all vertical at the pre (before) Mac Sharry arable areas, shown by **Qb** above, because of the limit on the total arable area, which applies at all levels of the analysis. Thus **S** turns vertical at the pre-Mac Sharry arable area (**Qb**), and the **S'** curve turns vertical at the equivalent allowable planted area (**Qp)** associated with this total area (at **Qp**/**Pb**). The difference between **Pb** and **Ps** is the additional rent necessary to attract **Qb**

from other uses to allow **Qp** to be planted, as shown in Figure 1, thus **S''** turns vertical at this point (which will lie inside the original demand curve, **D**, according to Figure 1).

However, **Mac Sharry shifts the demand curve**: to the **left** because the market price for cereals is reduced by 55 ecu/t. (to **D'**); and then back to the **right** again because of the compensation payments of 45 ecu/t. which is all paid on the basis of base area, hence for most farms resulting in a move to beyond the original demand curve, to **D''**.

Equilibrium will now be established at the intersection of the demand curve (for planted areas) with the vertical **S'** curve, coinciding with the vertical **S''** curve. The demand for total arable area will (if the demand curve shifts to **D''**) result in an increase in the price of land from **Pb** to **P''**, while the demand for planted area now establishes a 'shadow' price on such land at **Pd**. Since **P'** is the rent needed from the planted area to provide the necessary rent (of **P''**) on the total arable area to attract this land from other uses, the *Mac Sharry package results in an additional rent to be earned from planted land as shown by the shaded area in the diagram. It is to be expected that this rent will be bid into arable area land prices, provided the license to receive arable area payments is entailed with the land.*

While this analysis is already complicated enough, it is not quite the end of the story. The Mac Sharry reforms also introduced headage payments for beef cattle and sheep, associated with maximum stocking rates. These payments thus also become associated with the marginal values of grazing land, hence tending to shift the supply curve of arable land (**S**) upwards. If this shift is sufficient to place the new arable equilibrium inside the previously established upper limits to arable areas (**Qb** and **Qp**), as it may be in some good grassland areas, then the previous analysis (Figure 1) comes back into play, and there may be a tendency for land to change use from arable to grassland. However, since the future of these policies is still in considerable doubt, the initial advantages to such a switch would need to be substantial to offset the loss of right to claim arable area payments, especially since entitlement to headage payments is also established according to previous histories of livestock production and purchase of new entitlements from existing owners will prove expensive. At this point, it seems acceptable to ignore this possibility.