Transferable Quotas

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Government interventions in the economy, when analysed using the supply and demand apparatus, are shown to produce little triangles of real loss or gain, on the ends of long rectangles of income transfer.

> Economists are interested in the little triangles
> Politicians are interested in the long rectangles

The same or very similar triangles can be associated with various different rectangles (or patterns of income transfer) depending on the policy instrument chosen.

For examples, a carbon tax inserts a wedge between the supply price and the demand price of the product of a carbon-using industry, causing production to fall and transferring revenue from both consumers and producers to the government (the tax).

An alternative instrument is a subsidy to producers (of the same magnitude as the tax) for not using carbon. Such a scheme is a bit messy but quite feasible: after all, American farmers have been doing well in the business of not-growing-hogs, of not-growing-wheat, of not-growing-whatever, for many years. The messiness consists in the need for establishing some base-line level of carbon use against which the reductions -- and hence the subsidy entitlement -- can be measured. But this can be done, albeit with the aid of some rough justice.

The subsidy scheme can produce the same little triangles as the tax, but the rectangles of transfer are different. The effect on consumers is the same as before: they pay more and consume less. Producers are better off: they receive the higher price and do not pay tax; they also receive the subsidy. The government is obviously worse off: it forgoes the tax revenue and has to make the subsidy payments.

Now suppose the government both levies a carbon tax and pays a carbon abatement subsidy, the sum of the two being equal to the previously-considered tax, or subsidy. At the margin the producer has the same incentive to cut back on carbon use, since a unit reduction saves him the tax and earns the subsidy.

I know this seems a unnecessarily complicated and crazy scheme, but I ask you to be patient and bear with me a little longer.

If the government were really clever, it could set the tax and subsidy rates such that the tax receipts were equal to the subsidy payments. The net transfer position of the government would then be neutral. Consumers would still lose and producers would still gain because of the rise in the price of the product.

Why should governments ever implement such an administratively complex scheme? Well, they shouldn't. But it may surprise you to learn that the same outcome can be obtained by means of a transferable carbon quota scheme. Assuming that quotas are given -- not sold -- to the affected

firms, the government neither gains nor loses revenue. The "taxes" are paid by firms which buy additional quota from other firms, and the "subsidies" received by the firms that sell quota.

The analogy would be even closer if the government acted as a clearing house, or a middle-man in the transfer of quotas.

That is one way of analysing a transferable quota scheme -- to see it as a combined tax-subsidy scheme.

Another way is to start with a non-transferable quota scheme of the "command-and-control" type, which, since it cannot take account of the different circumstances of the many firms involved, gives rise to an inefficient pattern of emission reduction. Making the quotas transferable ameliorates these inefficiencies, and, in the limit, eliminates them.

There is a good deal of bureaucratic consensus in favour of a transferable quota scheme rather than a tax on a means of reducing pollution. I suspect that this is because;

1. Quotas are more acceptable to producers in that, in so far as production of emission-intensive goods is reduced, their prices are raised, to the benefit of producers. The scheme can operate like a production-limiting cartel.
2. The initial allocation of quotas provides opportunities for the exercise of bureaucratic power.
3. The quantitative effect of quotas on emissions is known, whereas it is uncertain with a tax, which will require trial and error to secure a given reduction.

The last point raises the question as to why anti-pollution policies are aimed at the quantity rather than the value dimension of emissions. Basically this is because the benefits of control are usually very imperfectly understood, and cannot be valued, whereas the quantity can. The benefit calculus for pollution control is political, the cost calculations are economic. The economist's role is essentially that of cost-effectiveness analyst.

The discussion has so far related to a closed economy. What modification are needed to deal with the case of an international quota scheme for carbon emissions?

From the perspective of an individual country, the argument that quotas will benefit carbon-using industries via an increase in the price of their product is much weaker in the case of internationally-traded goods. The demand curves for traded goods are much more elastic than for non-traded, and hence reduction in their output will have little effect on their price. This would not be true if all foreign competitors experienced similar cost rises and output reductions to us, but there is likely to be considerable variation even within Annex1 countries, and competitors from non-Annex1 countries would not be affected. Clearly the situation will vary from product to product: electricity generation produces a non-traded good, while aluminium smelting faces competition from undeveloped countries.

A second difference concerns the little triangles of gain or loss. For most pollutants we know the sign of the little triangles, even if we have very little idea of their magnitude. But for CO_2 we don't even know the sign. One does not have to be a total rat-bag to believe that increased atmospheric CO_2 will have a moderate warming affect and stimulate photosynthesis, both effects being beneficent. The fact that migration is occurring from frost-belts to sun-belts is indicative of a preference for warmer climates.

Even if emitting CO_2 is a negative externality, the effects of Kyoto cut-backs will be insignificant in view of the increasing emissions from the rest of the world and the fact that CO_2 is a minor greenhouse gas. Surely it is time to adapt to the issue at hand Sir Roy Harrod's phrase regarding post-war policies in Britain: "Are these hardships really necessary?"

I now turn to a discussion of some of the experience that has been gained from quota schemes.

We have had quite a few quota scheme in Australia and in most cases quotas have not been transferable. I quote from the index of Ted Seiper's 1982 book, *Rationalising Rustic Regulation*:

Quota schemes
- Beef Diversification Scheme
- cotton yarn
- market entitlement (two pool)

Quotas
- hen
- margarine
- metropolitan milk
- sugar acreage
- sugar output
- transferability of
  - industry ossification without
  - law of restricted
  - political disadvantages of
- tobacco
- wheat

Major non-agricultural schemes have included import quotas and fish quotas -- both having transferability -- and military conscription, which did not. (In this respect our conscription differed from that in Napoleonic France and in the northern states in the American Civil War, where the conscript could avoid service by paying someone else to take his place.)

Of the agricultural quotas listed above, only hen quotas were transferable, and then only intrastate, and with the permission of the authorities. This led Sieper to remark that "the law of restricted quota transferability may be as well established as the law of demand." He went on to argue:

> "Quota schemes afford the opportunity for detailed administrative regulation under heavy sanction. In effect such quotas belong in part to politicians ... . The control they allow is a valuable asset which these interests cannot be expected to lightly toss away. Since the political process is not dominated by a single undifferentiated producer interest, the ability to shift the distribution of industry rents among competing claimants on the balance of marginal political influence changes is central to successful government."

Several studies have been made of the workings of transferable pollution quota schemes in the USA. In one case, quotas for lead in petrol, the scheme operated more or less an economists had predicted, with very active trading in lead quotas and substantial cost savings.(Hahn, 1989, p.101-103) In other schemes, much lower volumes of trading and smaller cost savings were observed than were predicted. How can we explain this performance? There are a number of possibilities.

1. The initial allocation of quotas was so "efficient" that there was little scope for trading. I would be inclined to discount this possibility.

2. The economists' predictions were not soundly based. This hypothesis gains plausibility from the consideration that, ultimately, costs are subjective: managers may have different expectations about future prices, the value of quotas, the operation of the scheme, etc. from those assumed by the economists. Also firms may operate with a degree of managerial slack, in which some optimization is sacrificed for "a quiet life". It is as wrong and as arrogant to assume that such slack can be overcome at no or little cost as it is for Mrs Holmes a Court to announce that with a bit more "education" we would all became republicans.[1]

3. There are various impediments of a bureaucratic or regulatory character to the transfer of quota. This is obviously a variant of point 2, ie. the economists' analysis was incomplete is that it neglected these impediments. For example, in some cases quota transfers had to be approved by the regulatory agency, and in one case, "Trades that only reduce operating costs are not allowed". (Hahn, 1989, p.98)

A tradeable allowances scheme for sulphur dioxide emissions is an interesting case. A utility that exceeded its allowance of SO_2 emissions could switch to a low sulphur fuel, install scrubbers in its smoke stacks, or purchase more allowances. Most opted for the first or second alternatives, and there was much less trading than predicted. This outcome has been attributed to (1) the costs and risks associated with allowance trading, and (2) the policies of the State public utilities commissioners whose cost recovery rules may make a more expensive option in fact be cheaper from the point of view of the utility, and which may distort the utilities' choices in other ways, eg. by directing them to buy coal mined in the state. The actual behaviour of the utilities is predicted well by the economists' model when it contains the restriction that only intrastate trades are permitted. (Bohi, 1994, p.27) Hen quotas revisited!

Throughout the world public utilities -- a major user of carbon fuels -- are nationalised, or, if privately-owned, subject to regulation. If, in the Federal system of the United States, very little interstate trade eventuated in the case of SO_2 allowances, might not the propensity for international trade in carbon quotas be even smaller?

Experience with transferable quota schemes thus shows that they are not -- as I earlier implied they were -- "equivalent" to tax, subsidy or tax-subsidy schemes. Equivalence is asserted by ignoring the institutional settings of the various schemes, and, in particular, by assuming away transaction costs. Markets -- and particularly well-functioning ones -- do not spring fully-formed from the commercial equivalent of the head of Zeus. They have to be entrepreneured and nurtured. The most perfect markets we have are stock and commodity exchanges which work on the basis of long-established and well-understood rules, and a substantial amount of trust. It is of interest that the US EPA has delegated the task of auctioning SO_2 emission permits to the Chicago Board of Trade, because of "its demonstrated ability in handling and processing financial instruments and using transactional information systems and because the EPA believes a significant benefit is created ... by having an auctioneer who is active in facilitating the permit market". (Industry Commission, 1997, p.45)

[1] A similar comment applies to the notion that we can reduce greenhouse gas emissions by means of "no regrets" policies, which seems to assume that greater energy efficiency can be achieved at little or no cost. For an analysis of the welfare effects of managerial slack, see Parish and Ng, 1972.

Use of markets for quotas is not encouraged by complicated rules for quota transferability or by frequent changes in the scheme as bureaucrats seek to fine-tune it -- in short by anything that makes for uncertainty. An international scheme would seem to have a lot of built-in uncertainty, since a multiplicity of jurisdictions could father a multiplicity of interpretation and a lot of strategic game-playing, not to mention simple cheating. (the cheating that seems to be endemic in the European Union's agricultural programs is an instructive example.)

To sum up:
Economists favour quota transferability as a means of ameliorating the inefficiency of uniform or arbitrary pollution cut-backs in disregard of relative costs.

Australian governments seem reluctant to dilute their command-and-control powers by allowing transfers of quotas.

American agencies have instituted trading schemes in quotas but have often hedged them about with complicated rules and regulations.

If Australia imposes CO_2 quotas I would favour the encouragement of trading quotas, even if, as seems likely State jealousies and other interest put obstacles in the way. Even if trading is attended by difficulties it may offer relief of some of the more costly inefficiencies.

I doubt whether international trading in quotas will be agreed to, or, if it is, whether much international trading will take place.

I regard the policy of greenhouse gas reduction as being misconceived, as it will impose substantial economic costs for very uncertain benefits -- which may in fact be zero or negative.

Strong political leadership is required to combat environmental catastrophism, of which global warming is but the latest scare, all of the earlier ones having failed to eventuate. By putting so much emphasis on the desirability of obtaining a marginal reduction in the cost of implementing greenhouse gas quotas, we run the danger of accepting without protest the great costs of the scheme even if implemented as efficiently as possible.

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