



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Managing Domestic Emissions Permit Trading: The Relevance of Canada's Supply Management Quotas

Richard R. Barichello

January 2004

Working Paper Number: 2004-02

Food and Resource Economics, University of British Columbia
Vancouver, Canada, V6T 1Z4
<http://www.agsci.ubc.ca/fre>

**Managing Domestic Emissions Permit Trading:
The Relevance of Canada's Supply Management Quotas***

Rick Barichello
University of British Columbia

March 2002

DRAFT: Comments welcomed

* I would like to acknowledge the valuable input received in seminars with the DET Working Committee (Halifax) and Agriculture and Agrifood Canada (Ottawa) in December 2001, from Bob MacGregor in particular, and the excellent research assistance I have received in the preparation of this paper from David Coney. However, I alone am responsible for remaining errors and omissions.

Executive Summary

The application of quota management techniques from Canada's supply management sector to a domestic emissions permit trading system is highly feasible and attractive. These two types of economic instruments are highly similar, and the lessons learned from managing quotas can be used with great profit to guide the design and implementation of a domestic emissions permit trading regime. In fact, there are few key characteristics of an efficient emissions permit trading system that has not been used or developed in the supply management regime. Put differently, despite apparent differences, the two systems are close analogs of each other. Even though quotas are focused on outputs and emissions permits on inputs, both cases involve an action that generates net income to the recipient or provides restricted access to something that is valuable. Quotas allow access to a market with a more profitable (higher) milk price. Emissions permits allow firms who produce greenhouse gases a potentially cheaper way to deal with them using the permit rather than following a potentially more expensive process of actually reducing their emissions.

There are key elements of such a system. First of all, it is most important to allow permits to trade among users with as few restrictions and as simple an administration as possible. If so, the initial allocation is not important as far as its efficiency is involved. The trading should embrace a geographic area that is broad and an openness to many traders. Monitoring of actual emissions and adequate enforcement is also critical. Plans for reducing permitted emissions over time are important and models for doing this are at hand in the supply management system.

It is also true that the supply management regimes illustrate potential pitfalls in an emissions permit trading system. The key lessons would be the following. First, quota systems can be run efficiently and with little difficulty, but they must be kept as simple as possible. One must not try to burden the allocation and transfer system with more objectives than the restriction that is intended. The result of trying to do many things in such a system is a growing number of regulations, the result of which is to make more difficult and reduce the prevalence of quota transfers. It thus adds a variety of economic costs, many of which are imposed on farm producers, and makes the system less efficient in terms of the allocation of output.

A second lesson is that it is possible to design and operate a quota/permit system that both works efficiently, through relatively unrestricted and open quota transfers, and can generate any income transfers that one might wish, through the initial quota allocation. The ease with which such a system can meet both political and economic objectives is welcome but uncommon across the range of policy instruments.

I. Introduction

In response to the Kyoto Accord on limiting greenhouse gases, there has been considerable interest across countries in using quantitative limitations on these gases as a policy instrument. Further, the idea of allowing these quantitative limits or permits to trade among firms or enterprises that are releasing these gases to the atmosphere has attracted a great deal of attention. This is due particularly to the efficiencies that would be generated by such a process whereby the firms with the most efficient, low cost, or effective production processes in terms of their GHG emissions, those that can most easily and efficiently meet their existing GHG limits, would have the greatest incentive to purchase and utilize these permits. This type of instrument might be considered to fall within a category of “economic” instruments in that it has value to its holder and lends itself to being traded within a market; indeed there are efficiency gains to allowing such a market to exist and operate freely.

If an emissions trading regime is to be considered for application to Canada, the issue of managing such a system comes quickly into question. There are many issues that arise in terms of system management, from stakeholders wondering how they would be treated to public officials concerned about how they will deal with the variety of contentious subjects known to arise, like initial and ongoing allocations of permits, how to allow transfers to take place, and what restrictions will be necessary to make this “market” work well.

There is one very rich source of information about how to manage such a system efficiently, drawn from at least 30 years of experience in managing Canada’s agricultural supply management quotas. There are very close parallels between running a system for emissions trading and running supply management quotas. Few questions or problems that may be expected to arise in an emissions trading system have not been experienced or dealt with in some part of the complex supply management regime. It is the purpose of this paper to describe Canada’s supply management quota system and draw out the important lessons that have been learned of relevance to managing an emissions trading system.

There are five topic areas that we will cover. First, by way of introducing the supply management quota systems, we will cover the two general types of quotas that are required to manage the system. Second, the roles of different levels of government will be reviewed. When appropriate, the different commodity schemes covered by supply management will be examined because the different commodities covered under supply management have quite different circumstances, resulting in rules and procedures that are sometimes quite different. Third, the subject of quota allocation will be covered, covering both *initial* allocations as well as subsequent or *ongoing* quota allocations, as well as issues of enforcement and monitoring of the quota limitation. Fourth, we will review quota transferability. This subject is at the heart of an efficient and effective quota system. The issues that are covered here include the different types of exchange systems used, problems with the size of quota trading jurisdictions and farms wishing to

exit or enter, as well as the capitalization of the benefits of the quota into its price. Finally, the lessons learned from the supply management system that are most relevant for an emissions permit trading system will be reviewed.

II. Brief Background to Supply Management and its Two Quota Types

The supply management sector in Canada covers two major agricultural industries, the dairy and poultry industries. These two sectors together are a substantial economic entity—they account for 20 percent of total sales at the farm level in Canadian agriculture. The critical characteristic of this sector for this study is that it is highly regulated through a particular type of marketing board. The marketing boards involved in supply management have considerably larger and more significant powers than do regular or “non-supply management” marketing boards. Specifically, they have the power collectively to restrict imports into the country, the power to control domestic supply through limitations on what farmers and provinces can produce or market, and as a result they can set the domestic price for their commodity. Other marketing boards can do many things in the marketing of a product, but they do not have these three powers.

To implement these two types of restrictions the supply management marketing boards use two different quota types. One is a *farm-level quota* that limits how much of a farmer’s output can be marketed. This quota is defined in terms of a *specified number of units of production* that can be sold *each year* into the domestic market. Therefore, it is unlike a license (e.g., a taxicab license) where the license (taxi medallion) is needed to engage in the industry but the output level (number of fares) is variable and left up to the firm concerned. Given this quantitative nature of the farm quota, there is a desire on the part of farmers to buy and sell these quotas, if only to allow farms to expand or contract the size of their enterprise. In most (provincial) jurisdictions, the regulations governing these quotas now allow farm quotas to be bought and sold, particularly in the dairy industry. Another important characteristic of these farm quotas is that there is usually no time period attached to them. They can be considered to “last” an indefinite period of time into the future, subject to the farmer meeting certain conditions. Finally, these quotas are formally owned and largely managed by the provincial marketing boards.

The other quota type is an *import quota* that provides a quantitative limit on import access across the different final consumer products within the dairy and poultry industries. Such quotas have existed and been administered since the introduction of supply management regimes in the early 1970s. Since the Uruguay Round Agreement on Agriculture came into effect in 1995, these quotas have become part of the agricultural trade regulatory “infrastructure” and are now referred to as “tariff rate quotas” (TRQs), or simply “tariff quotas.” Like farm quotas, they also specify a certain quantity of imports that are allowed. They are different from farm quotas in that they are allotted annually, not permanently. In other words, there is legally no guarantee that next year’s allotments will be allocated to this year’s quota holders. But, in fact, for most quota holders, getting their import quota allotment renewed or re-allocated in subsequent years is quite likely. These quotas are managed by the federal Department of Foreign Affairs and International

Trade (DFAIT), following Canada's trade commitments in the Uruguay Round Agreement on Agriculture.¹

Because these two quota types encompass a range of quota types, rules, and regulations they present two useful points of comparison in designing a system of tradable domestic emissions permits. This is all the more so when one considers that the essential elements of a domestic emissions permit trading system are the same as the key elements of the two quota systems about to be reviewed in more detail. In terms of coverage in this paper, we will describe the farm level quotas in somewhat more detail due to the greater complexity of those quotas.

III. The Role of Different Levels of Government

A. Farm Marketing Quotas

Government arrangements for these quotas are complex and they differ across commodities. A familiar theme in the case of farm marketing quotas is that jurisdiction is shared between federal and provincial governments, making federal-provincial committees and joint decision-making common, in both regulations and operational procedures.²

The federal government role differs by commodity and is often tied up with these federal-provincial committees. In the poultry industry, federal government involvement comes through an oversight council, the National Farm Products Council, whose mandate is to assist producer groups in the formation of "agencies" to engage in collective action to market farm products, including authority over inter-provincial and export marketing, and to supervise such agencies that have formed. Of course, the federal government was instrumental in earlier years in the policy design of supply management regimes by setting out the legislative framework to permit what are known as "orderly marketing" schemes. This is the legislation under which the National Farm Products Council operates. Two examples of national agencies in the poultry industry are the Canadian Egg Marketing Agency (CEMA) and the Canadian Chicken Marketing Agency (CCMA).

Following a somewhat different model, the federal government also plays an important role in the dairy industry. In this case it is through a designated *federal agency*, the Canadian Dairy Commission (CDC). This agency is more directly involved in dairy industry policies and their implementation than in the case of the poultry industry model outlined above. It recommends milk production targets, operates an offer-to-purchase price support scheme that underwrites industrial milk prices across the country, administers inter-provincial agreements to pool sales revenues, operates storage

¹ These import quotas are effectively enforced through "over-quota" tariffs that are large enough to make imports above the TRQ uneconomic. The effect of these tariffs when coupled with the inability to use export subsidies is to keep domestic within-quota production at the level of domestic consumption.

² Part of the reason for this is to make legal the restrictions on inter-provincial trade inherent in a supply management regime. Another reason is that import restrictions under the GATT were considered acceptable if there was in place a cross-province agreement to limit domestic production (Article 11).

programs, and generally coordinates the implementation of the National Milk Marketing Plan. Most of these functions impinge directly or indirectly on decisions regarding farm quotas.

However, the federal government is also involved with the provinces in the important Canadian Milk Supply Management Committee (CMSMC). This federal-provincial committee makes the important decisions on how much milk should be produced and how it should be allocated across provinces.

The provincial governments are involved in supply management regimes, and quota decisions, through the provincial marketing boards. Provincial boards are party to a variety of national decisions through the federal-provincial committees just discussed, such as in the case of aggregate milk quota levels through the Canadian Milk Supply Management Committee. But they are more singularly involved in the implementation of national rules and decisions within each province. These boards are usually run relatively independently of provincial governments, but the provinces can often influence board decisions by their power to appoint, or replace, board members.

1. Dairy Industry Details

The role of different government levels in the dairy industry can be illustrated by the sequence of decisions that are made in the normal implementation of farm level quotas. This process begins with the farm and processor price for milk, which is determined by a federal government policy decision for both prices. Then, given these milk prices, the quantity demanded for all milk products is estimated by the CDC, and aggregated to the total domestic supply of milk needed, which is a critical data input provided to the CMSMC. The federal-provincial CMSMC makes the final decision on total domestic milk supply needed. It also decides upon the allocation of this total to each province, determining its total provincial quota. The basis for this provincial allocation decision is usually made with reference to its historical allotment. In other words, national increases or decreases in quota are usually translated into corresponding provincial allotment increases or decreases.³ Then, the last step in determining farmers' individual quotas is for the provincial marketing board to take its provincial allotment and determine the allocation to individual farmers. This process is also usually based on historical allotments held by individual farmers, just as it is at the provincial level described above.⁴

2. Poultry Industry Details

In the poultry industry, there is a roughly similar allocation of responsibilities as in dairy, described above. There is, however, a less direct role of the federal government in the national poultry agencies. In this industry, it is the national agencies that estimate

³ There are a small number of exceptions to this process, where there has been a decision to make a different allocation to a particular province on the basis of case-specific circumstances.

⁴ There is another distinction in the dairy industry between the federal and provincial governments and that concerns the fluid milk industry. The preceding discussion applies to the industrial milk component of the dairy industry while the fluid milk component is regulated by provincial governments. This includes decisions on pricing, quotas to cover the production of fluid milk, and any associated regulations. Although there were reasons for making the provinces responsible for the administration of this portion of the milk industry it has added to the complexity of the overall milk industry and its management.

national demand for their products, hence national quota levels, and allocations for inter-provincial trade and exports. Farm level pricing is done by the national agencies, at least in terms of establishing target ranges for prices. In some cases, provincial boards make adjustments to that price in their province (for example, some chicken boards establish a minimum farm price within their province). The national agencies, in some cases, also run national quota exchanges, and sometimes undertake national licensing of farm producers. The provincial poultry boards also do largely what provincial milk boards do. They usually allocate provincial quota to producers, and put forward detailed rules to govern its allocation, trade, and general administration.

Provincial boards, for both industries, often add many other regulations than those that pertain directly to quota allocation and trading as described above. In fact, it can be said in general that boards often practice quite heavy levels of micro-management. Some examples of these other regulations include the mandatory licensing of all producers,⁵ setting of minimum and maximum levels of quota holding at the farm level (i.e., size of enterprise), pooling of receipts across products, sales, and time periods, setting of a system of monetary levies and taxes for various circumstances, plus in-kind levies on farmers' quotas, regulating procedures for export selling, and the establishment of quota reserves for managing the quota system and to fund special programs such as for new entrants.

B. Role of Different Government Levels in Tariff Rate Quotas (TRQs)

It is relatively straightforward to describe the role of different levels of government in the administration of Canada's supply management import quotas, or TRQs. They are managed by the federal Department of Foreign Affairs and International Trade (DFAIT) in accordance with Canada's commitments made in the Uruguay Round (UR) Agreement on Agriculture. The specific agency within DFAIT that administers these quotas is the Export and Import Controls Bureau. There is some communication between DFAIT and the national agency involved in that commodity in terms of certain elements of administration. There is no provincial or local government involvement with these quotas; jurisdiction for all elements of international trade falls to the federal government.

Summary Details of TRQ Administration

Most of the regulations and procedures for obtaining and using the quotas are the same with TRQs as they were for import quotas prior to 1995. The level of these quotas is embedded in Canada's UR commitments. The role of DFAIT is to allocate them to individual firms and set up, or maintain, the rules by which they are administered. Most of the TRQ allocations are received by private firms. There is one post-1995 exception and that is for butter where the CDC is the sole importer.

⁵ This licensing involves quite tight control of who can own quota. In particular, boards usually require that only those involved in the production process can own the quota. This restricts considerably one's ability to rent quota and makes complete rental of one's quota impossible. This required linkage of asset ownership to the production process is not common in other industries. It reduces the efficiency of capital markets in such industries and introduces a barrier to entry to new farmers who do not have large amounts of capital.

The allocation procedures vary by commodity, especially varying by whether there has been increases or decreases in demand for the commodity in question. Mostly, they emphasize historical importers and firms with established operations and distribution lines. Sometimes allocations are proportional to production or sales, and sometimes an allocation depends upon specific component needs in the production process. In other cases, TRQs are allocated on a first come, first served basis. There are sometimes options for new firms to apply for import quota. Almost always there is an adjustment for any previous quota left unfilled. “Use it or lose it” is the rule almost universally applied, with an allowance for sufficient prior notification to the administering agency. There are some size restrictions per company for TRQ holding allowed, and some Canadian residency conditions. No financial element is involved in the quota allocation process between quota recipients and the administering agency. That is, there is no auctioning and no charge for a quota allocation. Therefore, all quota rents accrue to the quota recipient. Some commodity rules still do not allow rentals or inter-firm quota transfers, but in most cases, these TRQs can be rented and sold.

IV. Quota Allocation to Individual Farms

To some, this aspect of a quota management system is the most important. In terms of the economics, it is important but the transfer arrangements are arguably more important. However, in terms of the politics of a quota system, the income or distributional changes occasioned by the quota system, quota allocations are centrally important. We begin by noting that there are two dimensions to quota allocation, (a) the initial allocation, and (b) any *changes* in farm allocations for individual or system-wide reasons.

1. Initial Allocation

Farm Quotas

Most of the supply management initial quota allocations occurred in the early 1970s, when these marketing regimes were being established. Quotas were distributed *gratis* to farm producers who were already in the industry at that time, and based on historical patterns of farm production. So the quantity of quota allocated was usually in proportion to farm production levels on each farm, using a distribution rule such as if a farm accounted for x percent of provincial production prior to the introduction of the supply management regime, that farm would also receive x percent of the provincial quota to be allocated. This would result in some reduction in production for farm recipients if the introduction of the supply management regime required some aggregate industry-wide cutback in production, as occurred in some cases. In others, the quota allotment was set equal to some previous years’ average production level.

Import Quotas (TRQs)

As noted earlier, import quotas or TRQs in Canada are annual quotas, so each year there is a new “initial” allocation. This allocation is also a *gratis* allocation, as in the case of the farm quotas. Also, like the farm quotas, import quotas have typically been allocated to historical holders. But the federal government bureau that allocates TRQs makes it very clear that it makes no legal commitment to renew allocations to existing holders

each year. In the case of some commodities, there are certain groups that are given a higher priority in TRQ allocations, depending on their commitments to serve the industry or some other characteristic judged to be important. For example, firms or industry groups that sometimes are given priority in TRQ allocations would be firms that require a certain (supply managed) input in their manufacturing process or have a certain distribution activity, or further processors that must buy domestic raw materials at higher prices than in the US but must also meet U.S. competition in their output without import protection (e.g., in chicken).⁶ Another allocation method for TRQs that is not uncommon is “first come, first served.”

Other options

There are other allocation rules or mechanisms that could have been used, for either farm quotas or TRQs. One allocation mechanism commonly recommended, and discussed earlier for import quotas, is an *auction*, although it is rarely used to allocate import quotas in practice. To my knowledge, auctions have never been used for initial supply management farm quota allocations. In very few cases, bids are taken for increases in quota allocations, but this is a recent development. The attractions of using auctions are that the system is open, prices are transparent, and the quota rents (the profits derived from the quota) accrue to the government. Of course, the latter point is also the main reason why auctions are *not* common, even for new allocations: existing quota holders strongly lobby government to allow them to keep what they see as “their” rents.

There are as many other allocation options as there is imagination to devise new ways of distributing quotas. This can be seen in the case of TRQs. To give quota to firms that can be seen to deserve it opens up the door for almost any initial allocation. However, as will be seen in the next section, if there is a well-developed opportunity to trade quotas broadly and with few restrictions, an ultimately efficient allocation of quota can arise from any initial distribution.

2. *New Quota Allocations*

It is not uncommon in some commodities, at least for some time periods, for new quota to be added to the system (national aggregate quota).⁷ The most common reason is an increase in aggregate demand, a situation that has been most common in the chicken or broiler sector. When there is such growth in consumption, new quota would be added at the national level, which is in turn allocated to provinces, and lastly to individual farms.

The mechanism for allocating this new quota to provinces has usually been a *pro rata* (equal percentage) increase. However, on occasion there have been special arrangements for certain provinces due to prior negotiated agreement.⁸ The mechanism for allocating

⁶ This is the situation for processors which produce higher value-added products such as chicken pot pies and frozen pizzas where their competitiveness with US processors is otherwise impaired from having to pay more than their US competitors for the raw chicken or milk inputs.

⁷ This is not an issue for import quotas because those quotas are set and allocated annually anyway.

⁸ One such example is a different mechanism for allocating industrial milk quota to British Columbia. These special arrangements have arisen to deal with regional differences in economic growth and competitiveness at the farm level. They have also become necessary due to the restrictions on

new quota to individual farms has been very similar to that for provinces. The most common allocation has usually been a *pro rata* increase, but sometimes there are special provisions for certain groups. For example, there are some cases where a specified amount of new quota is withheld first for a new entrant pool, then the balance of the new quota is allocated on a *pro rata* basis.

There is a modified and more sophisticated model for new quota allocation when demand for the product is growing that has been applied in some provinces in the chicken sector. Quota here is defined into different categories, primary and secondary. Primary quota is the “permanent” or “base” quota, and secondary quota is considered to be temporary. When there is an increase in demand, but one that is not (yet) known to be permanent, secondary quota is increased accordingly. However, once that increase in demand is judged to be permanent, then the secondary or temporary quota is rolled into the primary category to become part of the permanent or base quota. This approach handles market growth well, especially when there is uncertainty in the short run about whether an increase in consumption is permanent or temporary. This method allows producers to share in any temporary market growth with an increase in production and quota, but they share also in the risk that this consumption, and the associated quota, may not be permanent.

3. *Quota Reductions*

Another market situation that must be dealt with is a reduction in demand that occurs from time to time in a variety of markets and occurs more systematically in some. It so happens that one of the supply management commodities is an example of the latter, and that is eggs. Consumption has trended downward for most of the past 15 or so years. In a market situation like this, the supply management regime must *subtract* quota from the national system over time.

This example is particularly relevant to an emissions permit trading system where allowable emissions are most likely to be declining over time. This will be necessary to deal with Kyoto targets in the 2008-2012 period. Further, following the procedures described in the second paragraph below, using a base quota plus an annually announced utilization rate, will have the effect of reducing the uncertainty faced by firms that hold emissions permits. Permit holders may not know in advance exactly the size of the reduction in allowed emissions, but they will be prepared for some pattern of reduction, and the permit market will reflect this expectation. A related point is that the government unit managing these permits should design and operate the permit trading system with the objective of keeping this uncertainty to a minimum.

The simplest way to deal with it is to follow similar rules to additions to aggregate quota. *Pro rata* reductions in quota to provinces, and then to producers, will accomplish the needed reduction in production in a clear and effective manner. It is also relatively more equitable for small farms than a fixed reduction in quota per farm, regardless of size. As in the case of additions to the aggregate quota stock, there are some cases of special prior

interprovincial transfers of quota. More flexibility in system design in terms of allowing interprovincial trade in quotas would have made unnecessary any special arrangements for certain provinces.

arrangements for quota reductions, whether it applies to provincial agreements or targeted groups of individual farmers.

A more sophisticated model can be used in cases of systematic quota reductions, like has been experienced in the egg industry. Here, we begin with the concepts of *Base* quota and some *utilization rate* each year. Provinces and individual farmers will have some base quota, but there will also be some percentage utilization rate announced each year which would usually be a level less than 100 percent for such markets. To illustrate, one year the utilization rate might be 90 percent, the next year only 88 percent, and so on. This has the substantial advantage that producers will always be aware that they will not be able to utilize fully their base quota, and they may well anticipate a decrease in utilization each year. Having a system that institutionalizes and makes more certain to all producers the otherwise uncertain and painful process of reductions in quota is an important advantage. Quota markets also accommodate ongoing quota reductions by building this information into revenue predictions and quota prices.

Enforcement of quota limits

A topic that is particularly important for managing quota systems that often gets assumed away or ignored is the ability to enforce the production or marketing limitations imposed by the quota. This is another reason to build into the system a method for changing, specifically reducing, quota allocations at the farm level--to provide for an enforcement mechanism to minimize over- and under-production relative to the quota allocation. Typically, enforcement is done by imposing a schedule of levies facing farms, in terms of quota cutbacks and/or monetary penalties, that apply if farms produce more than their quota. The penalty often is large enough to lower the net price facing farmers to the U.S. price, the world price, or a lower price. The schedule of overproduction fines can be non-linear, increasing with the degree of overproduction.

If the farm fails to utilize its quota, the penalties that are usually applied are in terms of quota reductions (the “use it or lose it” provisions), although these tend to be less onerous than overproduction penalties. For example, some flexibility is usually allowed so only underproduction below 90 percent of the quota is usually penalized. Furthermore, some temporal flexibility or grace period is usually allowed, depending on the situation and the commodity. Quota cutback provisions may only apply in a second year of underuse.⁹

Enforcement measures assume that marketing levels by farm can be monitored. This is often taken for granted, but is sometimes relevant in supply management and may be relevant also for emissions permits. Some creative solutions have been explored in the supply management area to deal with cases where there can be difficulties in output monitoring. For example, in the poultry sector other quotas have sometimes been used. In addition to an egg quota, hen quotas have been added. Another alternative is to add a quota on the square feet of facilities. These are viable options due to the nearly fixed

⁹ Quota acquired by a Board through such penalties usually goes into a “quota reserve” which is used for various purposes including ad hoc reallocations, a source of supply for special programs (e.g., new entrants), or “financing” over-quota production at the provincial level.

proportions between hen numbers and square feet of space in the technology of producing eggs. Both alternatives are highly correlated with the actual output level.

External and Internal Pressures on Quota Allocations

It is to be expected that there will be internal pressures by the domestic stakeholders of the supply management system to have an allocation system that allows them to keep the quota rents or advantages provided by the system. The stakeholders referred to would be primarily the farmers, but also marketing board and national agency members, with processors having a secondary level of influence. In the case of TRQs, the stakeholders would be the importers, but in some cases also certain processors and distributors. The current systems, whether for farm quotas or TRQs, show the results of these internal pressures, with provincial differences in regulations and procedures often showing which groups are the most powerful stakeholders.

In terms of external pressures there appear to be few. Trade obligations, of course, determine tariff and total TRQ levels, and apply to any measure that would be judged to be an export subsidy. However they do not apply to the provincial or firm-level allocation of either farm quotas or TRQs.

Evaluating Alternative Allocations

Within the supply management regime, including both farm and import quotas, there are many alternative quota allocation rules and allocations themselves that have been proposed and actually used. Auctions are often touted as the preferred method of quota allocation. However, unless one wishes that all the quota rents accrue to the government, other methods of allocation can be similarly as efficient. The key element of an economically efficient quota system is to have the lowest cost firms doing the production and this situation is facilitated by an open, transparent and easy-to-use quota market that permits low cost transferability.¹⁰ So with sufficient ease of transfer built into the quota system, there is little reason on the basis of efficiency or resource allocation to oppose or support one allocation mechanism against another.

V. Quota Transferability

Easy transferability of quota, or an open, transparent and low cost quota market, is a *critical* element of a well-functioning quota regime, particularly in terms of the economics of the system. Not only does transferability increase the flexibility of the system to quota or permit holders, but allowing a market in this economic instrument has the great advantage of providing prices on the quota or permit that gives important signals to quota/permit holders about their value. This will allow the instrument to be

¹⁰ Another important feature of a well functioning quota market is sufficient liquidity, an issue that arises in cases of “thin” quota markets. Greater liquidity may be facilitated by quota auctions when combined with an in-kind quota transfer tax and an auctioning off of the quota reserves so acquired by the Board. If liquidity is a major concern, the Board can go so far as to “tax” every quota-holder each year (or other time period) some amount of his or her previously held quota (not just when quota is transferred), and then auction off that quota.

allocated to those firms who make the best use of them. It is also particularly important for system managers to realize that a well-functioning market in these quotas minimizes the need for bureaucratic allocation devices or interventions.¹¹

There are different ways in which quota can be transferred. An important distinction is between the sale or purchase of quota and quota rental arrangements. The purchase and sale of quota is a relatively permanent or long term transaction, whereas quota rental is temporary, usually only for a year or less. Both kinds of transfers have important advantages to farmer or importers, and in an ideal world, both types of transfer would be allowed and occur side by side, just like we see in most real estate and many equipment markets, for example.

The Canadian supply management system has shifted increasingly over the years since its inception to allowing quota to be transferable among farmers, mostly via the permanent purchase and sale of the asset. Rentals of quota are most commonly prohibited, for reasons that are not always obvious. But changes are occurring here too, in the direction of some rentals being allowed, such as through a swap arrangements that in effect mimic a rental transaction.

Quota market mechanisms

The most common means of farm quota transfer is through formal quota exchanges, usually run by the marketing board. Farmers submit bids to buy and offers to sell, and the marketing board matches them to find the market-clearing price. All transfers for that iteration on the exchange then change hands at that price. Usually these exchanges operate once a month. This means there is no opportunity to change one's bid or offer until the next month. The results of these exchanges are usually published by some means. Typically two types of transfers, whole farm transfers and sales to relatives, are not required to use the quota exchange.

The quota market takes on different forms in some jurisdictions. Some marketing boards allow or have allowed quota transfers to be done through private quota brokers or through other private means (advertising in trade magazines and newspapers). In other cases, quota changes hands on an informal basis but through the marketing board. In almost all cases, whatever the means of exchange, a transfer of quota requires some kind of Board approval. And there are still some Boards that do not permit the quota to be exchanged or traded independently of the farm itself (i.e., the quota is tied to land and buildings). Finally, in a few cases, some Boards still attempt to prevent quota from taking on a value, particularly when the quota is tied to farm premises. However, such vain efforts are quite uncommon now after other jurisdictions that previously attempted to eliminate quota values found that the task was close to impossible. A great deal of regulatory effort and accountants' costs can be spent doing this, and the gains are marginal. If Boards wish to

¹¹ One important lesson from supply management quota administrations is the need to avoid the temptation to over-regulate quota markets, such as adding new objectives for the system to meet. One example is that some Boards have tried to use quota market regulations to hide the quota value. This serious mistake has meant more difficult transferability and a less efficient distribution of the quota among producers, in addition to reducing farmers' flexibility in adjusting their output level to changing economic circumstances.

remove some or all of the capital gains from quota transfers, they could simply tax the quota transfer in some way or even auction it.

Quota Transfer Regulations

Even with the operation of these quota exchanges, there are still many other provincial marketing board regulations on quota transfers, some of which are relatively benign, but others that have some economic effect, usually an economic cost. Almost all Boards require Board approval of a transfer. Transfer fees, mentioned above as a possibility, are in fact common. They are usually an in-kind tax (x units of quota or y percentage of the units transferred) with the quota amounts taxed payable to the Board. In some provinces for some commodities, quota cannot be transferred from one region to other regions within the province. Most Boards do not permit quota from within that province to be transferred to out-of-province farms.¹² Recently some quota within provinces has been designated “federal” quota, which has the distinction it can be traded interprovincially, but this is still a relatively small proportion of provincial quota.

Problem of Thin Quota Markets

Another issue concerning quota transfers and quota markets is whether these markets are large, or small and illiquid (thin). This can be an issue in some jurisdictions, more often in the poultry industry than in dairy due to the smaller producer base in poultry. One way of solving this problem is to move to larger quota trading jurisdictions, such as from several provinces, each with small quota markets, to one regional quota market, such as one for Western Canada, Eastern Canada, or even one national market. This idea, allowing a multi-province quota market, has been widely discussed in the dairy industry, and has gone as far as a limited common market for quota among several eastern provinces. Such moves have tended to be opposed by some processors and provincial governments who see a potential loss of commodity (e.g., milk) sales, economic activity and jobs in those regions that have less of a comparative advantage in that commodity, even though there would be net gains to the common trading region as a whole.

Another way of dealing with illiquid quota markets was mentioned above in footnote 6. There can be an in-kind tax on quota transfers where the quota flows to a Board operated reserve, and that reserve or part of it can be sold periodically, typically auctioned, to increase the amount of quota available on the market for purchase.

Entry into and Exit from the industry

Supply management systems are often criticized for inflexibility, and one example of such a criticism applies to new entrants. With all the restrictions on quota transfers in some industries, do quota systems prevent new lower cost or more efficient entrants from entering the industry? This is a potentially valid concern, but it is valid only when quota transferability is heavily restricted. If quota transfers are sufficiently unrestricted and

¹² One reason for interprovincial or interregional transfer restrictions is to introduce a form of protection for processing plants in that jurisdiction. Similarly, some Boards try to regulate the amount of milk allocated to each processing plants, also a form of protection for plants. In both cases, market allocation mechanisms exist, are feasible, and are superior in arriving at a low cost and efficient distribution of production among farmers and processing among milk plants.

accessible, any newcomer can enter the industry, with one proviso, that the person can finance the quota purchase. Quota transferability also encourages the less efficient farmers to leave the industry. They can see the market value of quota and the quota price will most likely exceed what it is worth to the high cost quota owner. Such a sale would have the added benefit of leaving the less efficient farmer with a considerable “pension” from the sale of the quota. In fact, the track record of these supply managed industries in terms of exits and new entrants supports these arguments. The rate of exit from these industries is at least as high as for non-supply managed farms.

A related argument that is relevant to quota transferability is the question of whether quota systems prevent an efficient allocation of quota across farmers and regions. This is partly a question of entry and exit. If quota transfers are left as open as possible, it encourages the high cost farmers to leave and it opens the door to new farmers who believe they are more efficient to enter, encouraging what is sometimes referred to as “structural adjustment” within the industry. This issue of whether quota systems are inefficient also depends on the free movement of quota across regions. If quota is easily transferable between regions, quota will shift toward lower cost or higher revenue regions, generating the economy-wide benefits of exploiting regions’ comparative advantage. So quota systems can work efficiently with open quota transferability, given the inherent costs of these scheme in restricting production and limiting imports.

High quota values

One criticism of Canada’s supply management quota regime is that it results in very high quota values. It is well-known that the high rents generated by increased domestic farm product prices are capitalized into high quota values. The argument is true—the cost of quota in the dairy industry now is in the range of \$20,000 per cow in a number of provinces, making the cost of purchasing enough quota for a 100-cow farm would be \$2 million. This cost becomes explicit when quotas are traded openly. This valuation of quota is also unavoidable, despite the efforts of some Boards to mask this value, as discussed earlier. It can be expected whenever the license or permit allows a firm to increase its revenues or decrease its costs, and it should be expected in a domestic emissions permit trading system as much as it is found in the supply management sector.

These high quota values also have two effects. First, such values will have the result of limiting the number of people who can enter the industry due to the inability of some individuals to raise the large sums of capital needed. However, observations from the supply managed sector show that there still seem to be plenty of people who can raise the necessary funds. Secondly, and perhaps more importantly, once farmers have invested in such assets, any kind of political change or reform of the quota system is made more difficult politically, due to strong opposition to moves that would result in declines in farm asset values.

This discussion indicates the importance of a quota transfer system that is flexible, accessible to all, and as unrestricted as possible. This means few restrictions on the types of entrants, existing farmers can buy or sell quota readily, quota also can be rented in or

rented out easily, and quota is allowed to move to and from any regions of the country. If so designed, farmers benefit, new entrants benefit, and the economy benefits.

VI. Conclusions: What Lessons for Emissions Permit Trading?

There are several lessons from Canada's supply management sector that are relevant to an emissions permit trading regime. First, quota systems can be run efficiently and with little difficulty, but they must be kept as simple as possible. One must not try to burden the allocation and transfer system with more objectives than the restriction that is intended. The result of trying to do many things in such a system is a growing number of regulations, the result of which is to make more difficult and reduce the prevalence of quota transfers. It thus adds a variety of economic costs, many of which are imposed on farm producers, and makes the system less efficient in terms of the allocation of output.

A second lesson is that it is possible to design and operate a quota/permit system that both works efficiently, through relatively unrestricted and open quota transfers, and can generate any income transfers that one might wish, through the initial quota allocation. The ease with which such a system can meet both political and economic objectives is welcome but uncommon across the range of policy instruments.

Third, supply management quotas are very relevant for emissions permit trading despite some apparent differences. Even though quotas are focused on outputs and emissions permits on inputs, both cases involve an action that generates net income to the recipient. In a general way, quotas and emissions permit both provide restricted access to something that is valuable. Quotas allow access to a market with a more profitable (higher) milk price. Emissions permits allow firms who produce greenhouse gases a potentially cheaper way to deal with them using the permit rather than following a potentially more expensive process of actually reducing their emissions.

Trade in quotas results in the farms that have the lowest cost, hence the most profitable farms, being able to pay the most for their quota, hence holding more quota and accounting for a larger share of industry production. Trade in emissions permits will result in firms who are low-cost in terms of their marginal abatement costs wanting to sell their allotted permits and expand production, paying out the (low) cost to reduce their emissions to live within their permitted emission level. Firms that have high marginal abatement costs will find it to their advantage to buy emissions permits rather than abate their GHG emissions, and possibly reduce output. The result will be that the firms with the lowest abatement costs will be using those methods to reduce their emission and expanding production, and enjoying the revenue from selling their permits. Firms with higher abatement costs will be buying permits instead of reducing their emissions, and cutting back their production. The net result will be a reduction in total emissions with the most efficient firms in terms of abatement costs doing most of the cutting back in emissions and increasing their share of production in that industry. An active trade in these permits will allow these environmentally desirable processes to take place and to do so in an economically efficient manner.

Some may argue that emissions permits are more short run than supply management quotas, but there are many similarities. Farm quotas are treated by farmers as if they are risky assets or as if they have a short time horizon. Import quotas (TRQs) look like they are very short term (one year) assets, like an annual emissions permit, but in fact they are treated like they are a much longer-lived asset than one year. And emissions permits will be known to continue into the future, albeit at levels that are not known with certainty. Therefore they will occupy a very similar role in the hands of the producer, being a long-lived asset but with short term uncertainty as to their actual level. Finally, there might appear to be a difference between the two assets, quotas and emission permits, because allowed emission levels are likely to fluctuate yet supply management quotas are fixed. However, a permit trading system can deal with periodic fluctuations by using the concepts of a base quota or permit and an annual, changeable utilization rate, a regime that is used extensively in some supply management quota systems (e.g., eggs).

Fourth, there are many details or features that can be recommended for emissions permits as well as for quotas.

- (a) Their purchase or sale should be allowed for long term adjustments, and short term rentals should be allowed to deal with annual fluctuations. The experience of farm quota systems give guidance to the former while the TRQ system gives guidance to the latter.
- (b) Impose a minimum number of restrictions on these trades and on potential traders, and keep the trading area within which permits can be traded as large as is administratively possible.
- (c) Ensure accurate monitoring of emissions and adequate enforcement measures. For emissions permits or quotas, this is critical to a well-functioning system and the challenges in doing so should not be underestimated.
- (d) Virtually any kind of initial permit allocation is compatible with a successful permit system.
- (e) Provisions for adding new permits or, most likely, making permit reductions, must be drawn up, and there are several models from the poultry sector of how to handle each of these two situations well. Defining a base emissions level and a “utilization rate” is likely to be a sound basis for emissions permits where allowable emissions are likely to decline over time.
- (f) Auctions for permit allocations have some advantages that are worth looking at, but they are not essential.
- (g) It may be necessary to take measures to ensure adequate liquidity in the traded permit market, and there are some guides to this from within the supply management system (in-kind tax on transfers, use of quota reserves).

References

Richard R. Barichello, "A Review of Tariff Rate Quota Administration in Canadian Agriculture," *Agricultural and Resource Economics Review*, Vol. 29, No. 1 (April 2000): 103-114.