Emissions Trading in New Zealand: Managing Economic Risk in the New Zealand Emissions Trading System

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Key messages

- Some economic risks cannot be reduced at the NZ Inc. level – they can only be reallocated. Other risks can be reduced by careful design.
- Consider temporarily limiting international sales to avoid extreme international prices being transmitted into the NZ economy.
- Move risk of extremely high prices to government: Include a 'safety valve' where the government will sell units at a fixed price – to avoid risk of extremely high prices or domestic illiquidity.
- Address 'leakage' issues – discussed in a separate paper in this series (Greenhalgh et al).
- Define units that are issued in advance as a share of the domestic target to spread the risk of changes in targets and reduce uncertainty about how they will be allocated.
- Make the emissions trading system as broad as possible by including as many gases and sources as is feasible.
- Encourage development of the secondary market.
- Do not revisit rules for free allocation once they are agreed.

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Where does economic risk come from?

An emissions trading system helps reduce the risk of damage from global climate change, lowers the risk of New Zealand non-compliance with Kyoto, and reduces the risk that controlling New Zealand's emissions will be extremely expensive to the economy. It also however, introduces some new economic risks. We have grouped those risks roughly in two categories: partially controllable risks where we can reduce the total risk to NZ Inc. by careful policy design; and uncontrollable risks where the issue is simply who should bear the risk.

Partially controllable risks

Some risks are partly within New Zealand control. If New Zealand is unable to, or chooses not to, fully link with international markets, there is some risk that the relatively small New Zealand market will not be particularly liquid – i.e. people will not be able to buy and sell at known prices when they want to. Similarly, in a New Zealand only market, if a large share of emission units is issued to one agent, or if one agent is able to accumulate a large share, they could corner the market and affect the market price. Both of these issues can be controlled with careful market design and disappear completely with complete linkages to well functioning international markets. In any case, even the domestic market alone is much larger than many quite well functioning environmental markets such as the New Zealand Individual Transferable Quota market for fisheries management.

The risk that New Zealand products and processes that are in competition with foreign production in unregulated countries could fall leading to higher emissions in unregulated countries, known as the problem of 'leakage' or 'competitiveness-at-risk', is dealt with in a separate paper.

Two other risks that emissions trading systems sometimes allow or even facilitate are related to opportunism by government and the private sector. Government can act opportunistically to benefit specific groups for political reasons by changing the way that some emission units are freely allocated. They could also change other system rules in response to special interests.

The private sector also could act opportunistically. They could lobby for preferential treatment either through delayed entry to the system, exemptions from some aspects, or free allocation of emission units. They will inevitably do this in the initial set-up phase of the system when the rules have not been set but can be deterred from doing it again later.

Uncontrollable risks

Carbon price variation

Variability and unpredictability in international carbon prices affect current compliance cost and returns to investments. The optimal level of emissions for each firm now and in the future depends on the carbon price path but this is highly uncertain.

The international price is driven by the total demand for emissions from countries that have caps under the international agreement and the supply of emissions units (currently this is the sum of the caps on Annex B countries that have ratified plus any global offsets). The price is very sensitive to the international agreement and

particularly to which countries are involved and what future targets are. Even in the absence of changes in the international agreement, the prices are likely to be highly volatile in the early years because people will be learning rapidly about their options for controlling greenhouse gases and domestic regulations in all countries will be changing. Model predictions of international prices are still highly dispersed.

Liability risk

Not only is the price uncertain but the quantity of emissions from each firm is only partly in their control (by changing the emission intensity of their activity). It is largely driven by factors outside their control: economic growth, changes in consumer preferences – including response to the higher prices resulting from greenhouse gas regulation, technology change, weather patterns, etc. Thus a firm is not able to accurately anticipate the total cost they will bear in relation to the regulation, or – if they are a point of obligation – the number of units they will need for future years.

Asset risk

New Zealand owns units for the whole of the first commitment period and can anticipate owning more in future. We cannot use all of these now for immediate compliance but they are an asset. The value of that asset will vary with expectations about future carbon prices. If some of the NZ units are allocated to the private sector, private sector actors will also face this risk.

As discussed above, changes in international coverage or targets could dramatically affect the international carbon price. It will also directly affect the number of future units New Zealand holds.

Changes in structure of international agreement, monitoring rules etc.

We will discuss the risks associated with changes in the structure of the international agreement, monitoring rules and other conditions, and how these can be addressed, in a later paper on how the system should be structured so it can evolve – i.e. adaptive management.

Strategies for managing economic risk

Options to reduce risk

For risks that are partially controllable, policy design can actually reduce risk. We divide these into three general approaches. The first two primarily apply when the New Zealand market needs to operate relatively independently of an international market – this is mostly relevant in the short term. Once international markets are working well, New Zealand emission units should be relatively freely tradable and market liquidity and price smoothing are no longer an issue.

Improve market liquidity and function

A first design step is to make the emissions trading system as broad as possible by including as many gases and sources as possible. This increases the potential volume of trade, and reduces the risk of concentration in ownership of emissions units. It also smooths the demand and supply of units to the extent that shocks are not correlated across sectors. Thus it is possible that demand for thermal

electricity rises sharply because lake levels are low leading to increased demand at the same time that a new nitrification inhibitor becomes widely available, reducing demand in the agricultural sector.

A second design goal is to make the system as simple as possible, both in terms of monitoring/modelling changes in emission unit requirements when activities change (particularly an issue in forestry and agriculture) and in terms of the administrative requirements for trading. Simplicity minimises the transaction costs of trading and reduces the uncertainty involved. This can be combined with education on how trading works so that small players can avoid mistakes and regret, and increase their trading confidence.

Simplicity and education will encourage small players including foresters and farmers to actively participate in the system thus increasing the number of participants as well as enhancing responsiveness to the price signals. Simplicity in the trading rules will encourage the development of an active secondary market where people can sell excess units with confidence that they can buy them back with little transaction cost penalty if their needs change.

Emission units can be allocated in a way that maximises liquidity. This could involve a combination of auctions, other sale mechanisms, and free allocation. If units are allocated to agents that are not points of obligation they will definitely be sellers.

Smooth prices/liabilities over time

Because greenhouse gases accumulate in the atmosphere, emission units can be saved (banked) to be used in future periods with no adverse environmental effect. Once units have been banked, these can be released to increase liquidity and to address short-term price variability. This smoothing can either happen through people using their own banks to supply the units they need in future periods or because they can sell them to others.

At the beginning of the emissions trading system there will be no banked units. This makes the system more vulnerable to adverse shocks and price variability in the first years. One way to address this is to allow people to ‘borrow’ units that will be issued in future periods. This creates a credibility problem if it is unlimited. If too many units are borrowed and used, people will be unable to comply in the future and if this happens on a system-wide basis New Zealand as a whole will be unable to comply and penalties on individuals out of compliance will become unenforceable. An alternative way to create limited ‘borrowing’ is to issue more than one year’s worth of units as the first vintage so some can be immediately banked to provide a buffer against short-term illiquidity and volatility.

Minimise opportunistic behaviour

The simplest way to avoid opportunistic behaviour is to minimise the number of future situations where rules would need to be renegotiated because they do not fit the new circumstances. The more the initial policy can define what will happen in future, or, where flexibility is needed, the process by which rules will be adapted, the less scope there is for opportunism.

One case where fixed rules are appropriate is for free allocation of emission units. These should be a one-off total amount even if they are issued gradually over

time. This is appropriate in any case where they are compensation for the loss of value in a 'stranded asset' (see paper by Stroombergen and Kerr in this series). Once free allocation rules are agreed, they should not be revisited. This is politically more difficult if the value of free allocation is very high – many may wish to revisit what may be seen as an excessive handout to some players. In the New Zealand context it seems as though free allocation may be quite strictly limited in both value and time period.

If output-based allocation is used to address leakage, the amount and targetting of this needs to change over time to reflect technology change and to reflect changing levels of international competition. As far as possible the rules for how this is done should be fixed in advance and not renegotiated.

We cannot anticipate all future developments that will affect the evolution of an emissions trading system. There are always unknown unknowns. This will inevitably create situations where new decisions with political implications need to be made. We cannot address these through fixed rules agreed in advance. We need to create robust institutions for adaptive management to minimise uncertainty about the future of the system and ensure that future decisions are made as fairly and efficiently as possible, i.e. without being vulnerable to excessive opportunism.

Options to reallocate risk

Limitations on international sales and 'safety valves'

One way to avoid the risk of very high carbon prices is to limit international sales. When people buy units overseas this lowers the price in New Zealand – there is no economic reason to restrict this. In contrast, when they sell units overseas they bring our carbon price up to the international price. A temporary ban on international sales would protect those who will be buying emission units. The price will then be the lower of the international price at which we can buy emission units and the price set in the domestic market. The domestic price results from the domestic supply of units (from forestry plus those issued by government) relative to the demand from the sectors that are included in the system at each point in time. Buyers of emission units would be protected at the expense of sellers.

Alternatively, the risk of a very high carbon price could be controlled if the government offers to sell unlimited emission units at a fixed price (or equivalently allow points of obligation to comply by paying a fixed fee rather than providing emission units). This price would be set high so that at acceptable carbon prices it does not drive the market. This is often referred to as a 'safety valve'. This would move some risk from the private sector (including all consumers) to the taxpayer and would benefit emission unit buyers at the expense of sellers.

Like a blanket limitation on international sales, use of a safety valve is incompatible with allowing people to sell emission units internationally. This is because people could play the system. When the international carbon price is higher than the fixed price, they could buy units from the government and then sell them at a higher price somewhere else or at a later time. With a fixed fee, they could sell at the high international price all the emission units that have already been issued, and comply entirely by paying the fee. In either case, this would lead

to a serious fiscal drain on the New Zealand taxpayer who would need to buy emission units internationally to meet our international obligations, but would be selling them at a lower price.

This drain will happen only if domestic or international prices systematically exceed the fixed price offered by the government. If the safety valve were ever likely to be used on a wide scale, emission units that have been issued would need to be held within the country. There would need to be a trigger mechanism that closes the market to international sales. The market would stay closed until prices fell or a higher market carbon price was considered acceptable within New Zealand. At that point the market could be opened again.

Even if emission units cannot be sold internationally, people could bank all the emission units to sell in a later period and use the safety valve mechanism for compliance in the short term. This would again impose a large fiscal drain on the taxpayer. Thus banked units from before the market is reopened could not be carried into the newly opened market. Some exceptions could be made for permits banked for precautionary reasons such as those banked during the growth phase of a forest, that are held for compliance at the point of harvest.

Some emission units may have been sold before the market is closed. If people anticipate that the market could be closed and want to maintain the option of selling internationally they will 'sell' them out of the New Zealand registry into a registry with fewer restrictions as soon as they can. The extent of this would be limited by the timing with which emission units are issued and by restrictions on sales in each year from New Zealand. Restrictions on sales in each year are required by Kyoto rules, the 'commitment period reserve', which aims to reduce the extent to which countries can oversell, in any case.

Risk sharing with and within the private sector

By issuing some emission units that cannot be used until future periods, that is units with future 'vintages', in advance, some asset risk is moved from taxpayers to the private sector. The private sector agents who choose hold future emission units will be those who benefit from having this type of financial asset in their portfolio – they will be less harmed by risk. Advance issuing facilitates risk management in the private sector by allowing agents to build up portfolios of emission units to match their projected emissions.

Reallocating risk of changes in international agreement and reducing uncertainty about how they will be translated into domestic policy

If some emission units of vintages from future commitment periods are issued in advance, they should be defined as a share of the domestic target – as defined in the international agreement. This explicitly spreads the risk of changes in international commitments between the public and private sectors. It also reduces uncertainty about how changes in the domestic target will be allocated among private actors so that this does not need to negotiated in future. It avoids much of the lobbying and political challenges associated with new decisions about cost bearing.

Further reading

Kerr, Suzi and Isabelle Sin with Joanna Hendy (2005) “Taxes vs permits: Options for price-based climate change regulation” Treasury Working Paper 05/02, April

Kerr, Suzi (2003) "Allocating risks in a domestic greenhouse gas trading system” Motu Working paper 03-01