Linking in the New Zealand ETS: lessons learned (and what to watch)

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Contributed paper prepared for presentation at the 59th AARES Annual Conference, Rotorua, New Zealand, February 10-13, 2015

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AARES
11 February, 2015
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Motu Economic and Public Policy Research
NZ ETS historical prices

Data Source: OM Financial
So now we have a huge bank!

What does this big bank mean for New Zealand? When will it run out? What drives price formation in a de-linked world....

Build a model
What’s going to happen going forward?

\[
\min \sum_{0}^{T} \frac{1}{(1 + r)^t} Costs(\text{mitigation}_t)
\]

Subject to:

\[F(\cdot)\]

\[F(\cdot)\] is a set of carbon constraints (sectors covered, size of caps, international linkages and initial bank)
Results from the first order conditions

• Prices equal marginal abatement costs in each period. The aggregate marginal abatement cost curve is the demand curve for units.

• Prices are increasing in stringency of the cap and business-as-usual (BAU) emissions.

• Prices rise at rate of interest or bank is empty.
Matlab

- Cap in each period: \( \vec{\omega} \)
- Interest rate: \( r \)
- BAU path \( \vec{u} \) and demand slopes \( \vec{m} \)

Emissions path \( e^* \)
Path of bank
Prices \( p^* \)
Simple illustrative model: cap

Bank is four times BAU (ETS sectors) in 2015

BAU emissions – assuming all forestry in ETS

Cap – 5% below 1990 for ETS sectors
Bank and price with no linking
Bank and price with no linking

Prices over time

Bank over time
What if we link?
What if we think we will be able to link in 2025?
What if we think we will be able to link in 2025?
What if we think international price will be low? The bank is too small!

Link announced

Prices over time

Linked

Original price path
Use up bank fast if ETS anticipates linking at low price
Back to reality

NZ withdraws from CP2

NZ starts buying CERs?

Delink Confirmed

Data Source: OM Financial
Main Takeaways

This is a learning tool to play with.

Linking and stringency are key!

There is a disconnect between the prices required to achieve a 5% below 1990 target and what the market is predicting.