Corrigendum to the note "The Emission Effect of Temporary Allowance Withdrawals in the EU Emissions Trading System"

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Issue with previous simulations

In the previous simulation run, in parallel to the withdrawal of 10 million allowances in 2021 and their reinjection in circulation in 2031, an exogenous adjustment to banking (namely +10 million tons in 2021, -10 million tons in 2031) was imposed *on top of* the model equilibrium outcomes, rather than letting the model endogenously determine market responses (in terms of price, banking and emission) to said withdrawal and reinjection on its own.

Such artificial banking superposition was not correct; indeed, from an intertemporal market equilibrium perspective, market actors (compliance and non-compliance entities alike) are at the margin indifferent between holding an allowance themselves or knowing that someone else holds it. In other words, all else equal, the effect of such temporary withdrawal has in principle no impact on market equilibrium, as it merely changes who holds the corresponding allowances, but not the overall number of allowances held on all accounts (i.e., aggregate banking). This theoretical result holds as long as there is no real allowance scarcity in the short term (which will only occur when banking is well below 833 million allowances).

Intuitively, and as shown below, this distorted (here, amplified) the impact of any temporary allowance withdrawal on price levels and cumulative emissions through the MSR.

Simulation results

Letting the model endogenously respond to the temporary withdrawal (namely, without exogenously interfering with banking as before) yields the following results:

	2021-2030	2031-2040	2041-2050	2051-2100	2021-2100
Average price (€)	+0.00985	+0.00229	-0.00004	-0.00031	+0.00132
Total emissions (million)	-1.289	-0.168	+0.009	0.114	-1.334
Cancellations (million)					+1.334

The key result is that the induced additional reduction in (cumulative) emissions is reduced by a factor of 10, down from 10.58 million tons to 1.33 million tons. There is thus a 1/10 scale between the size of the withdrawal and that of the induced reduction in emission.

Interpretation and discussion

Note that the long-term impact of the temporary withdrawal does not completely vanish in contrast to what theory predicts. Yet interpreting the simulation result should be subject to caution. Indeed, just as in reality there may be small, indirect effects of the temporary withdrawal on market prices and thus on banking and MSR-driven cancellations (e.g., due to various frictions), the model also produces small effects due to embedded features that reflect realistic market behaviours (e.g., imperfect foresight and shocks, rolling planning horizon).

Therefore, the results displayed in the above table are more reflective of these features – and as such could be interpreted as "noise" w.r.t. theoretical predictions – than of actual impacts of the temporary withdrawal. That the price increases and emissions decrease relative to the reference case in the 2031-40 period despite allowances being reinjected back into circulation in 2031 is an illustration of such "noise". Additionally, note in passing that the annual price effect of the withdrawal and reinjection are quite small due to intertemporal optimization that smoothes out the variation in annual supply over time: only +5.4 (resp. -6.2) cts on the year of the withdrawal (resp. reinjection).

Other applicable caveats

There are other factors that warrant caution when using and interpreting the above simulation results. First, the MSR parameters have been changed since this study was conducted, although this does not change the theoretical result that a temporary withdrawal should not affect market outcomes in principle. Second, recent market developments may call for a recalibration of the model parameters to better capture market behaviours, notably the length of the rolling planning horizon. Indeed, preliminary evidence suggests that market agents may have become more farsighted because of the recent reforms (Sitarz et al., 2023).

Model robustness

Economic soundness and scientific validity of the model is attested by two peer-reviewed publications in top-field academic journals (Quemin & Trotignon, 2021; Quemin, 2022). Also note that a simplified version of this model was used for the European Commission's MSR reform impact assessment in 2021, see European Commission (2021).

References

European Commission (2021). SWD(2021) 601 final. Part 2/4. https://ec.europa.eu/transparency/documents-register/detail?ref=SWD(2021)601&lang=en

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