



Contents lists available at ScienceDirect

International Journal of Industrial Organization

www.elsevier.com/locate/ijio



Permit market auctions with allowance reserves[☆]

Peyman Khezr^a, Ian A. MacKenzie^{a,*}

School of Economics, University of Queensland, Brisbane 4072, Australia



ARTICLE INFO

Article history:

Received 5 February 2018

Revised 18 July 2018

Accepted 17 September 2018

Available online 22 September 2018

JEL classification:

D44

L50

Q52

Keywords:

Multi-unit auction

Pollution permit

Allowance reserve

ABSTRACT

This article investigates multi-unit uniform-price auctions with allowance reserves, where a fixed quantity of units is supplemented by an additional supply reserve. The reserve automatically releases units if a sufficiently high price is triggered. This mechanism is commonly used in pollution permit auctions. The main justification for implementing an allowance reserve is to assist in cost containment. We show—paradoxically—that incorporating an allowance reserve into a permit auction may increase the clearing price. This has implications for all major cap-and-trade markets, including the US Regional Greenhouse Gas Initiative.

© 2018 Elsevier B.V. All rights reserved.

1. Introduction

Cap-and-trade markets are now a common regulatory instrument to control pollution. Behind this enthusiastic adoption is the core economic rationale of least-cost pollution control: the aggregate costs of pollution control are minimized by allowing firms to trade a fixed number of pollution permits. Although regulation is apparently least-cost, current regulators have real concerns about the prohibitive costs to industry. The potential

[☆] We would like to thank the Editor, Harry Paarsch, and two anonymous referees whose comments helped us to improve this article. We would also like to thank seminar participants at Monash and the World Congress of Environmental and Resource Economists (WCERE) 2018, Gothenburg. The usual disclaimer applies.

* Corresponding author.

E-mail address: i.mackenzie@uq.edu.au (I.A. MacKenzie).

for price volatility—and therefore increased (and uncertain) industry costs—has placed the issue of cost containment at the center of policy debates (Tatsutani and Pizer, 2008). Many regulators have implemented cost-containment procedures to reduce the equilibrium clearing price and thereby reduce firms' compliance costs to ensure strong industry support. One such mechanism is the so-called *allowance reserve*, which provides the market with a fixed reserve of permits that can be released if a threshold permit price is triggered (Murray et al., 2009).¹ This mechanism is now common practice in major cap-and-trade markets, which include the Cost Containment Reserve (CCR) of the US Regional Greenhouse Gas Initiative (RGGI).

Within these cap-and-trade markets, a second structural change has been observed; the process of initial permit allocation is moving away from free allocation towards auctioning. Until very recently, the auctions that did exist tended to follow a very standard format: a uniform-price auction with a fixed number of permits. Importantly, however, many of these auction formats have been modified to include the existence of an allowance reserve. Thus in some schemes—such as RGGI—the auction system now has endogeneity in the supply of permits: firms' bids can now activate the release of additional permits.² Given the addition of an allowance reserve, it is *a priori* unclear how the auction equilibria will change. Having an additional supply of permits realized on reaching a trigger price may have consequences for firms' equilibrium bidding strategies, revenue generation, and the functioning of the permit market. Given that both the auctioning of permits and the presence of an allowance reserve are prevalent in contemporary cap-and-trade markets, it is important to consider how these two institutional structures interact and the implications for cost containment.

In this article we investigate a permit auction under the presence of an allowance reserve. We model a permit auction in which the supply of permits can be increased if the clearing price reaches a threshold trigger price that is determined by the regulator. We provide firms' equilibrium bidding strategies, as well as the implications for the regulator's revenue and auction clearing prices. We find the key determinants of whether an allowance reserve is successful or not depends on the regulator's choice of trigger price and size of the allowance reserve. We find the inclusion of an allowance reserve may provide incentives for “convergence” of the clearing price towards the trigger price. If the clearing price

¹ This is also known as a ‘soft’ price ceiling (Fell et al., 2012). Other cost containment processes—such as ‘hard’ price ceilings and price collars—have also been considered. Cost containment can be established by allowing offsets to enter the market as well as the introduction of banking and borrowing mechanisms (Fell and Morgenstern, 2010).

² This is also similar to the allowance reserve proposed in H.R. 2454 (Waxman–Markey Bill). Other schemes have subtle differences. As documented in Fell (2015), the European Commission decided to: (i) ‘backload’ permits by reducing the number of permits for sale at auction in Phase III of the scheme. Allowances were planned to be reduced by 400 million in 2014, 300 million in 2015 and 200 million in 2016, as well as (ii) creating the Market Stability Reserve (MSR). The MSR is triggered when the number of permits in circulation falls outside a pre-defined range. In particular, allowances are added to the reserve (taken away from future auctions) if the total surplus of permits is higher than 833 million allowances. Similarly, allowances are released from the reserve if the total surplus falls below 400 million allowances. In the Californian Cap-and-Trade Program AB-32, the reserve can be sold to firms for a predetermined (three-tiered) price (Borenstein et al., 2015; Khezr and MacKenzie, 2018).

Download English Version:

<https://daneshyari.com/en/article/11023386>

Download Persian Version:

<https://daneshyari.com/article/11023386>

[Daneshyari.com](https://daneshyari.com)