Vehicle Quota System in Singapore
Is there an alternative design that is more fair and meets the required policy objectives?

The Vehicle Quota System was introduced in Singapore in May 1990 to combat the failure of ownership taxes in controlling the growth of the car population in the land scarce city state. To buy a new vehicle in Singapore, one must bid to obtain a Certificate of Entitlement (COE). This permit is linked to the vehicle and allows the owner to use the vehicle for 10 years. COEs are allocated through a twice monthly bidding exercise.

COE categorization:
- Feb 2014 refinement to COE criteria – understand

**COE Category**
- **A**: Car with engine capacity up to 1600cc and Maximum Power Output up to 97kW (130bhp)
- **B**: Car with engine capacity above 1600cc and Maximum Power Output above 97kW (130bhp)
- **C**: Goods Vehicle and Bus
- **D**: Motorcycle
- **E**: Open – all except motorcycle

For the purposes of this poster, we focus on COEs for cars purchased by consumers (CAT A,B,E). The descriptors are designed as a proxy to separate the market into cheaper and more expensive car models.

**Key Events:**
- Feb 2013 – Monetary Authority of Singapore (MAS), Singapore’s central bank, introduces more stringent car loan restrictions
- Feb 2014 – Land Transport Authority (LTA) refines COE criteria to better segment mass market cars and luxury cars
- 2015 to 2016 – Entrance and rapid growth of private car-hire firms Uber and Grab

**Mechanics of the COE auction**

The COE auction is based on a second price open bid auction. Each bidder may only submit one bid. Once you successfully bid for a COE, they must be registered within 3 or 6 months for CAT E and A,B respectively. Bidder can monitor the current COE Price and adjust their bids higher within the 2 day bidding window.

**Bidding example:**

- **Highest bid**
- **COE Quota**
- **COE Premium Value**

This form of auction leads to bidders having a dominant strategy of submitting bids of their exact willingness to pay. The open category, E, exists to allow for changes in the composition of the car population. However, as much of the data shows, it has tracked CAT B closely. We can infer that the most probable reason is the higher willingness to pay of high income bidders squeezing out any chance for CAT E being used for mass market cars.

There have been previous reviews into transferability of the COE leading to speculative bids, inflating the COE premiums. One key issue is the fact that by including subcategorization to safeguard mass market buyers and then including an open category leads to arbitrage opportunities working against the initial policy move to promote social equity.

**How do we know it’s working well?**

By design there should be a spread between CAT A and CAT B premiums. The green and blue lines above.

1. **Policy changes (and market readjustment) –**
   - i) When MAS decided to introduce car financing restrictions to protect households from overburdening themselves with debt on a depreciating asset.
   - ii) LTA introducing new category descriptors to refine the proxy for cheap and expensive cars.
2. **The second main convergence can be explained by increased demand in CAT A from private-hire firms.** Early 2015 marked the entrance of these firms, such as Uber and Grab. The lack of response of premiums to quota increases has been attributed to individual buyers having to compete with the growth appetite of the two deep pocketed firms.

**Conclusions**

Given the alternatives and the physical constraint applied by Singapore’s small land size, an auction approach remains the most efficient way to enforce a quota on the growth of the car population.

One alteration that could be applied to the system is the implementation of uniform-percentage auctions. This would keep the essence of market forces of supply and demand, as well as the game theory efficiency of bidders submitting their true values for the COE. At the same time it would create an equal system, with all bidders, regardless of the value of their cars, paying the same effective tax rate.

In 2017, the Vehicle Quota Premiums raised $5.98 billion. This represents 8% of Government revenue.

In comparison Personal Income Tax receipts were $510.7 billion. The tax collected can be reinvested into public transport. If used correctly the VQS can act as a powerful redistributive tool. Although the system itself is highly regressive, the revenue generated by the system, in general, will come from those with higher incomes. This system actually redistributes wealth from those able to afford the purchase taxes to own a car to those who do not and must use public transport.

The fairness of the system leads to a more political economy question of whether or not everyone in Singapore should have the right to purchase a license plate. This system has been rejected twice by the government citing it would make the system overly complex for consumers to use.

The COE auctions in Singapore are highly complex. Much more than just demand driving the premium price in response to a fixed supply, as can be seen by the 2 graphs on the left. Transferability, Categorization, Historical Premiums as well as Public and Private information changing values of bidders all have a role to play in COE premium setting.

**References available upon request.**