# Incentive Auctions

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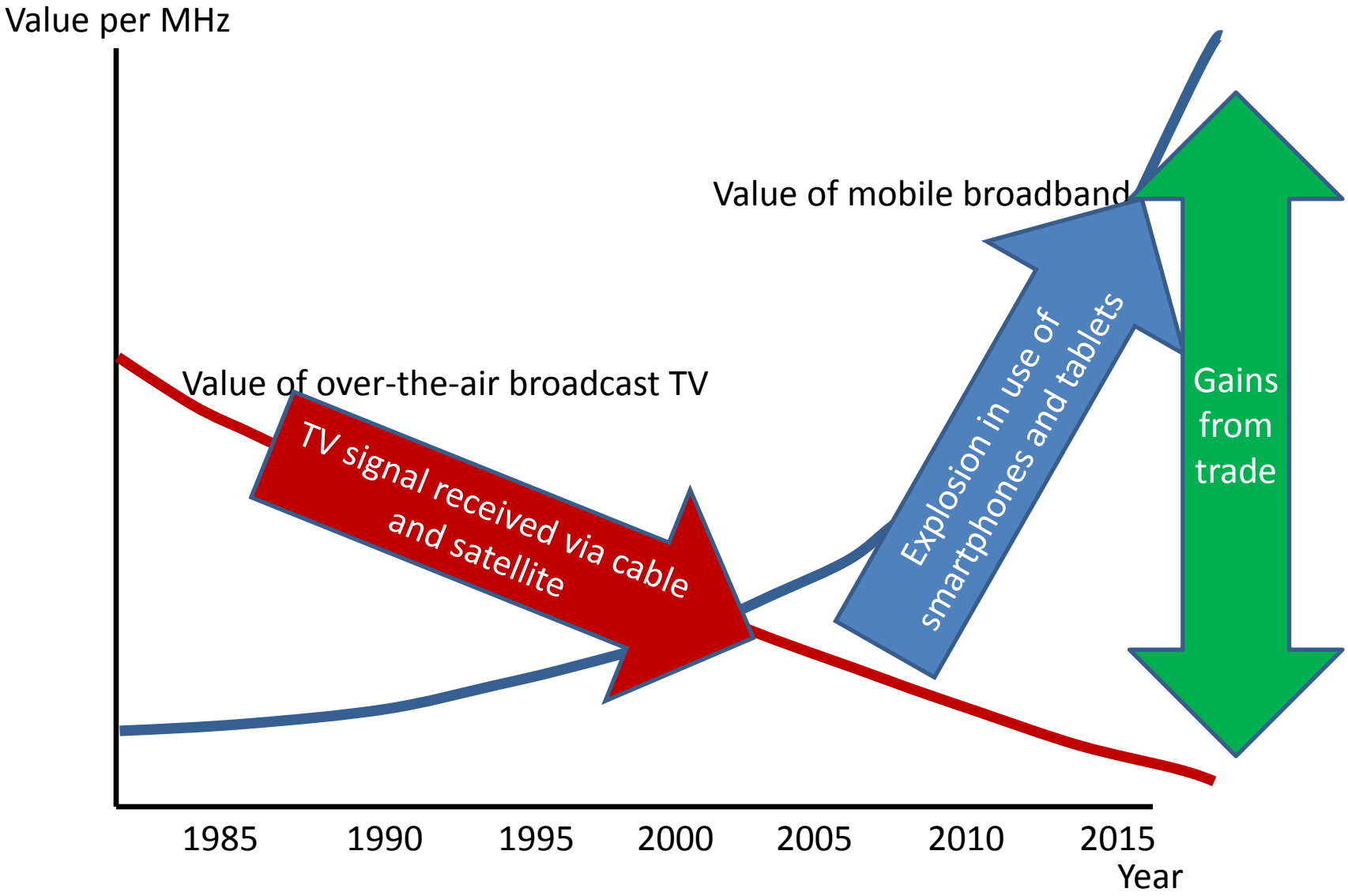
# Incentive auctions


*Auction includes essential regulatory steps to address market failures in the secondary market for spectrum*

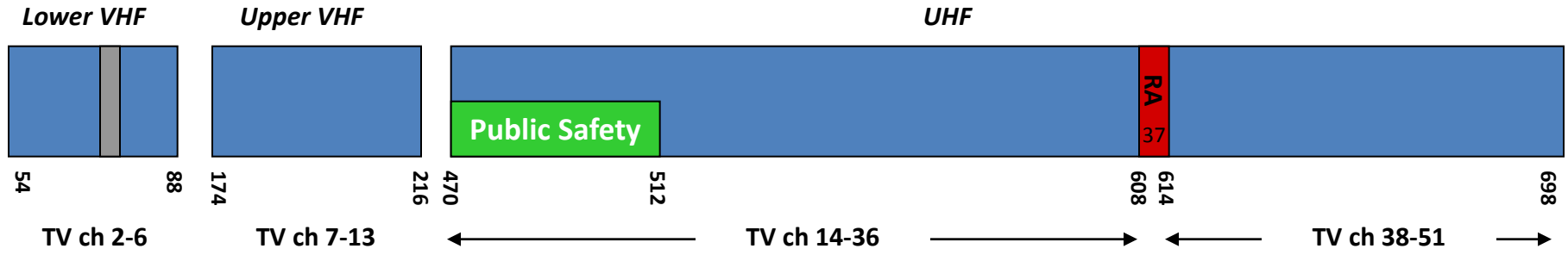
# Letter from 112 economists, 6 April 2011

# Motivation

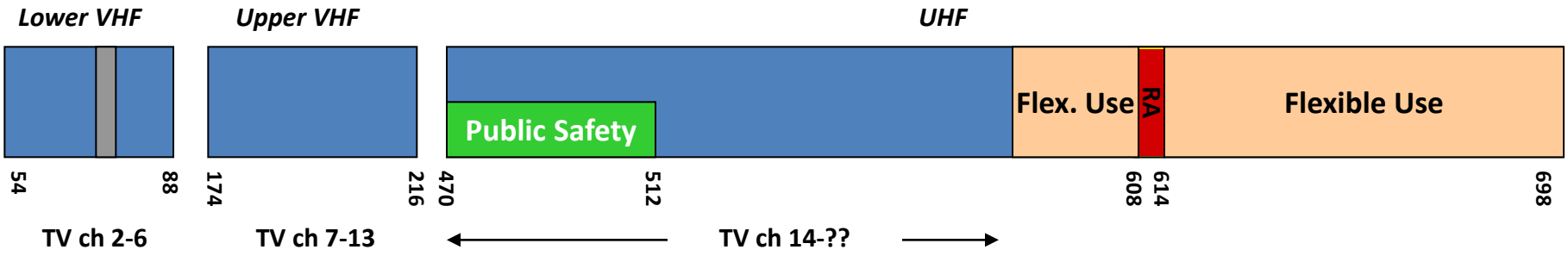

Value per MHz
Value of mobile broadband
Value of over-the-air broadcast TV
TV signal received via cable and satellite
Explosion in use of smartphones and tablets
Gains from trade
1985
1990
1995
2000
2005
2010
2015
Year

# VHF and UHF bands

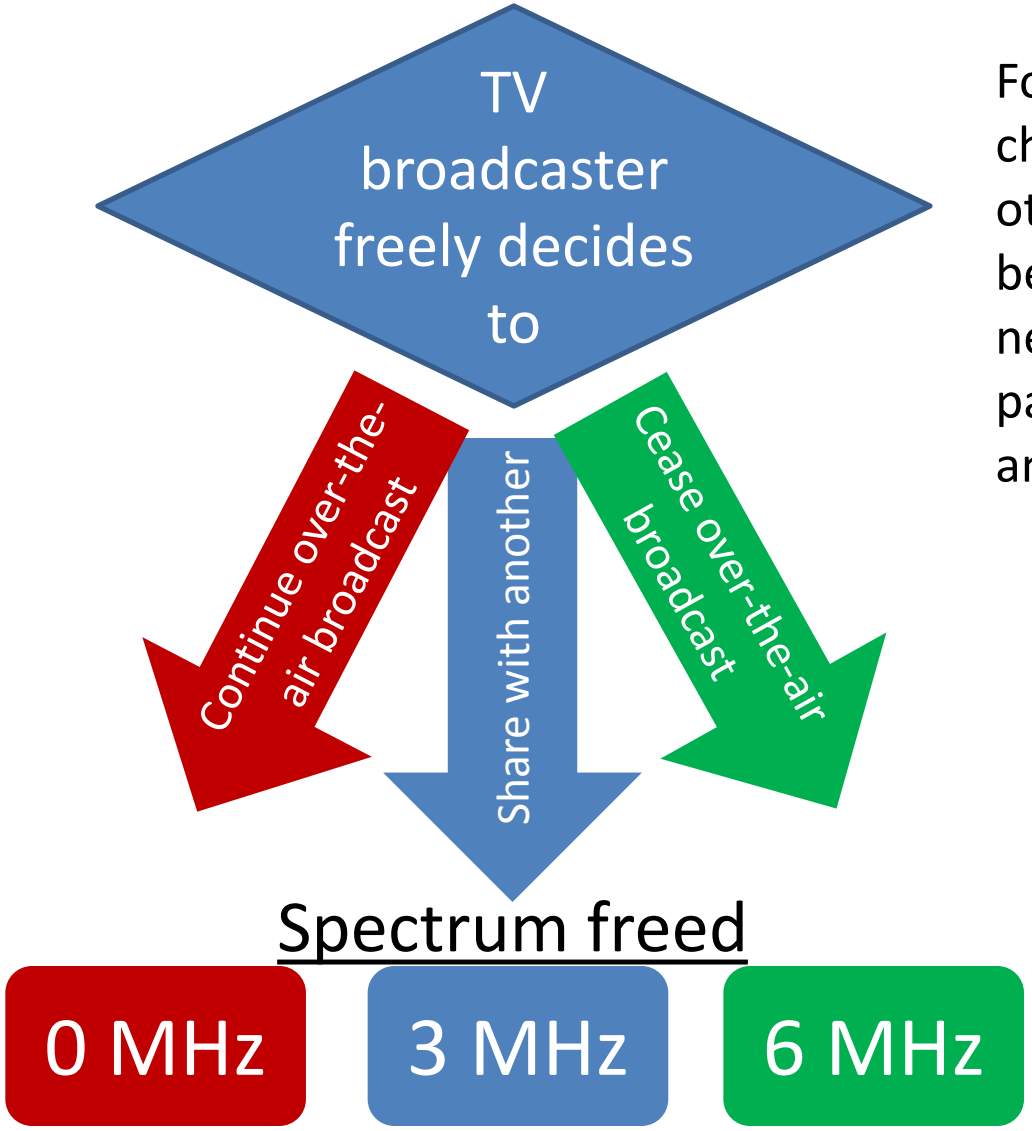
## *Current uses (TV broadcast)*




## *Possible future uses*



# Voluntary approach

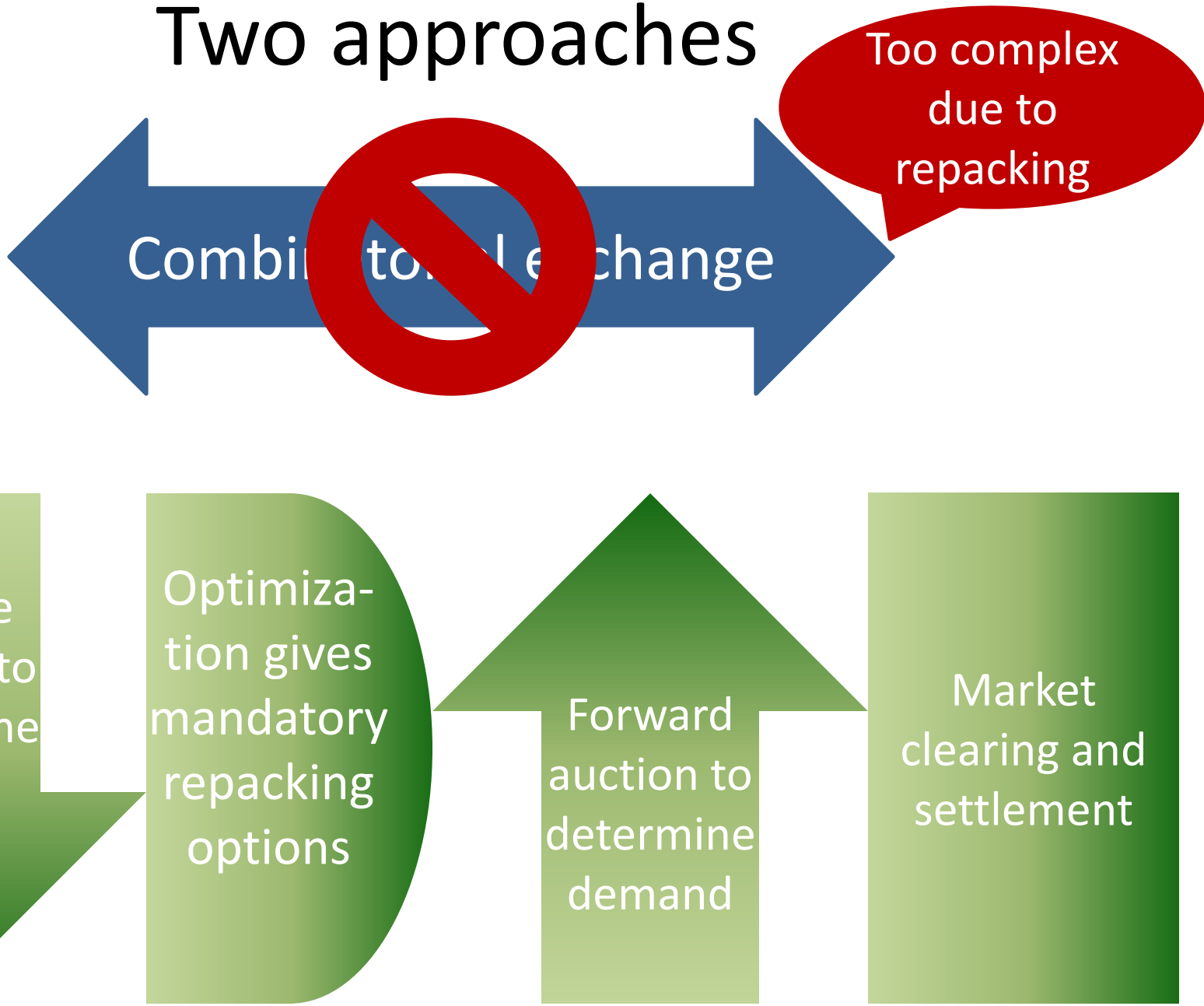


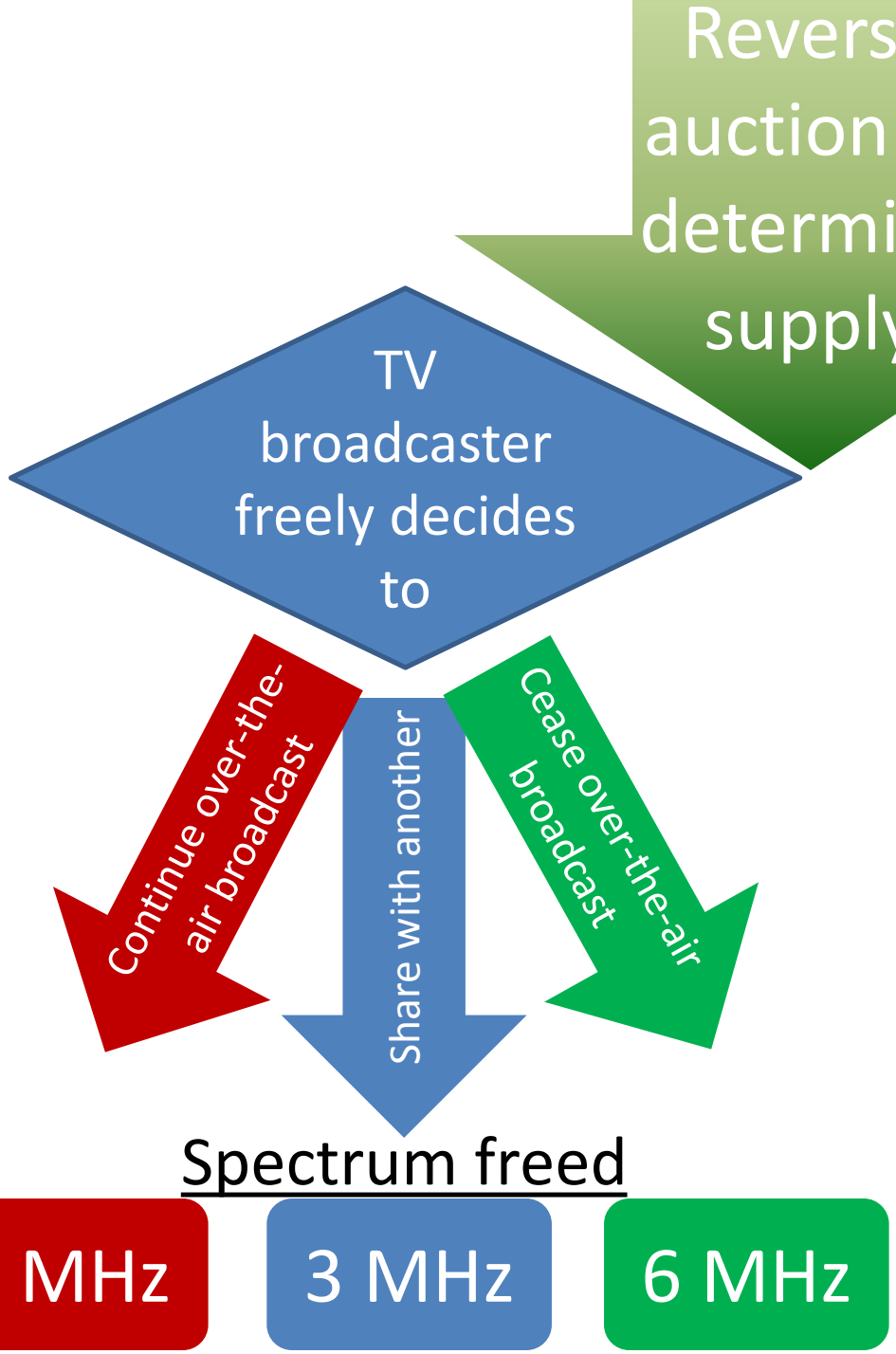

For simplicity, I assume that channel sharing is only 2:1; other possibilities could also be considered, including negotiated shares with particular partners announced at qualification

# Why voluntary?

- *More likely to quickly clear spectrum*
  - Broadcasters benefit from cooperating
- *Lower economic cost of clearing*
  - Spectrum given up only by broadcasters who put smallest value on over-the-air signal
- *Market pricing for clearing*
  - Avoids costly administrative process
- *Efficient clearing*
  - Clear only when
    value to mobile operator > value to TV broadcaster

# Two approaches






- Mostly single channel
- Price discovery less important

=>

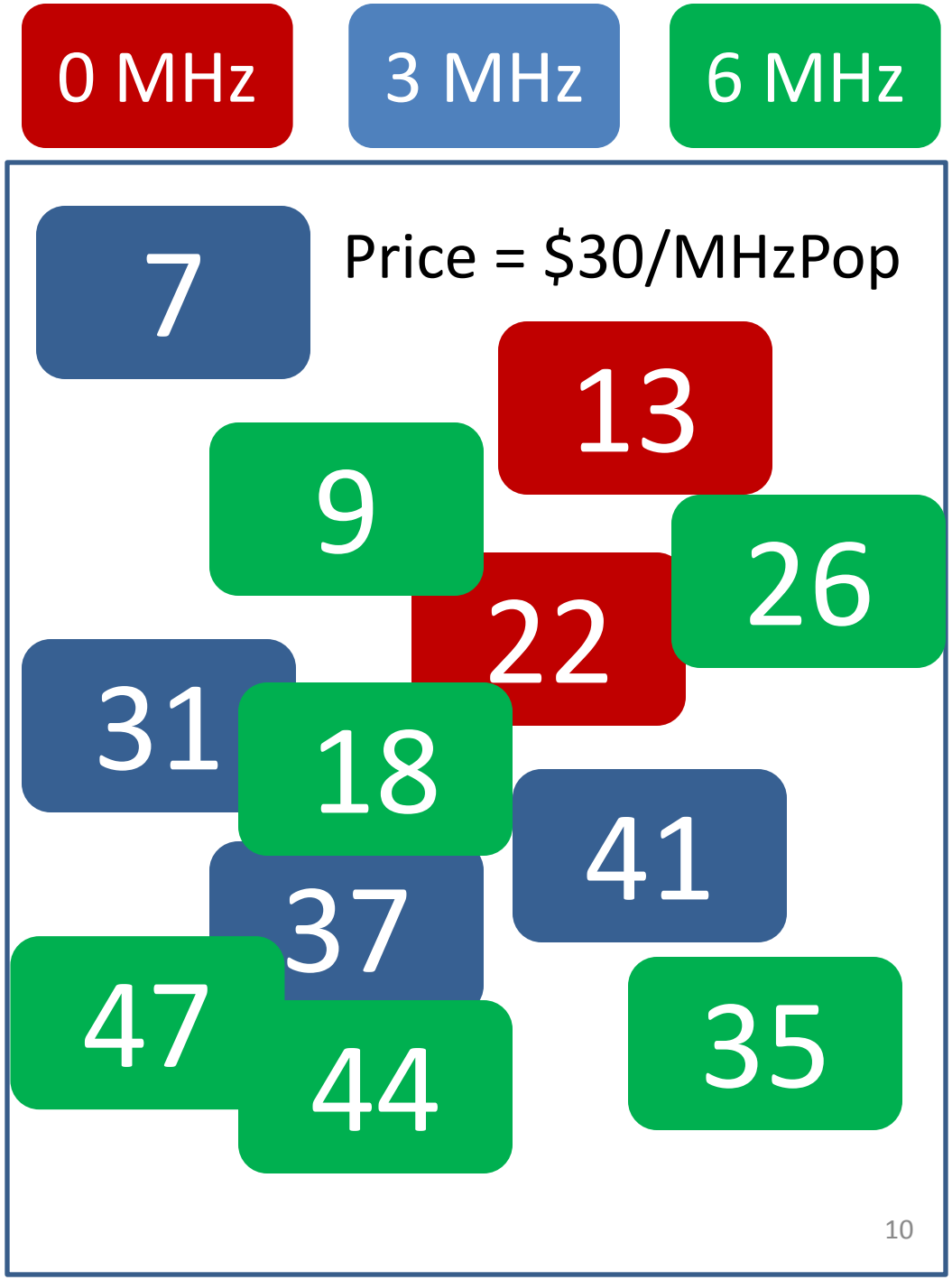
- Sealed-bid auction or descending clock
  - Price to cease
  - Price to share

# Washington DC

P = $30

Reverse auction to determine supply

S = 48

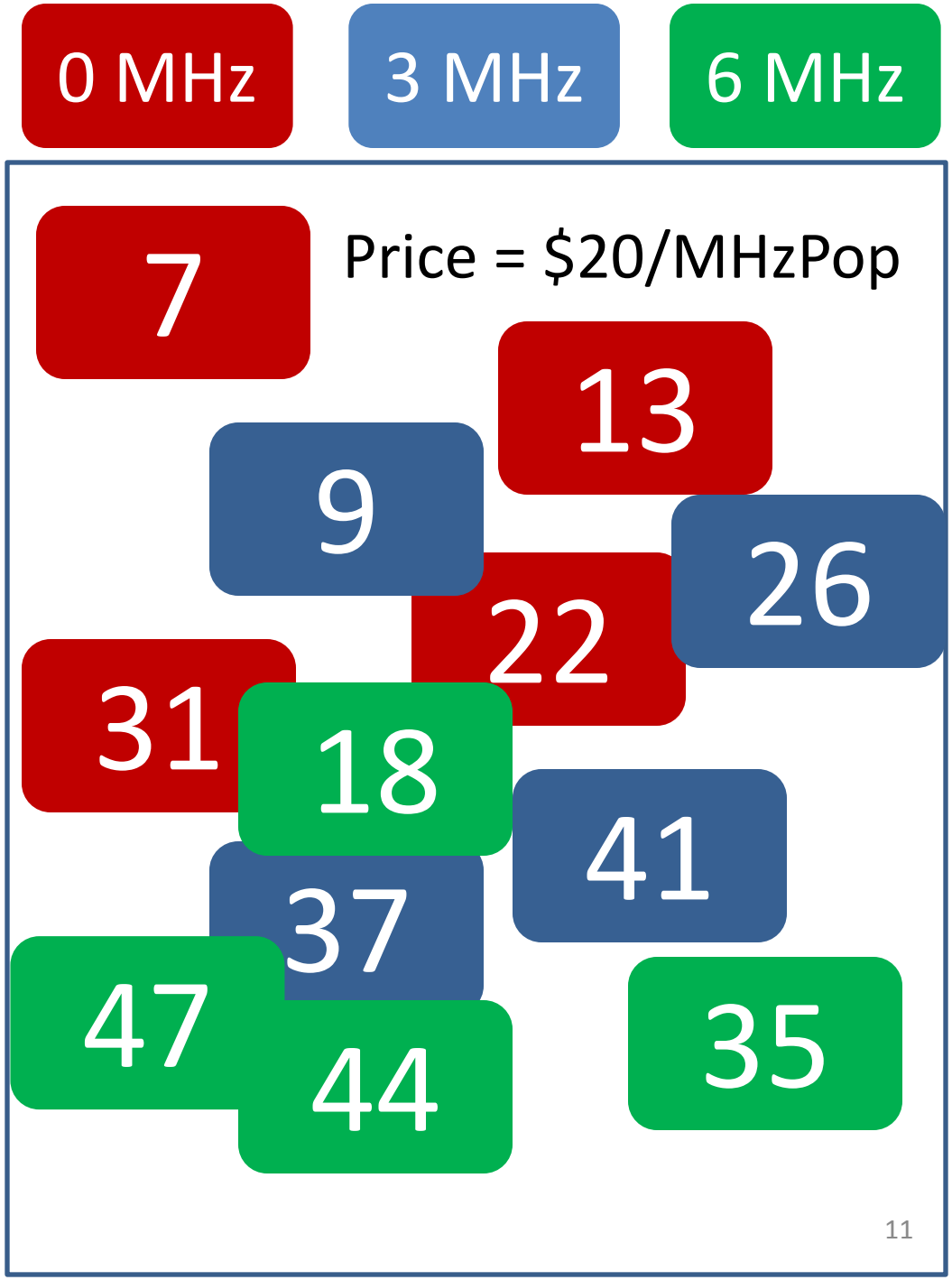


# Washington DC

P = $20

Reverse auction to determine supply

S = 36

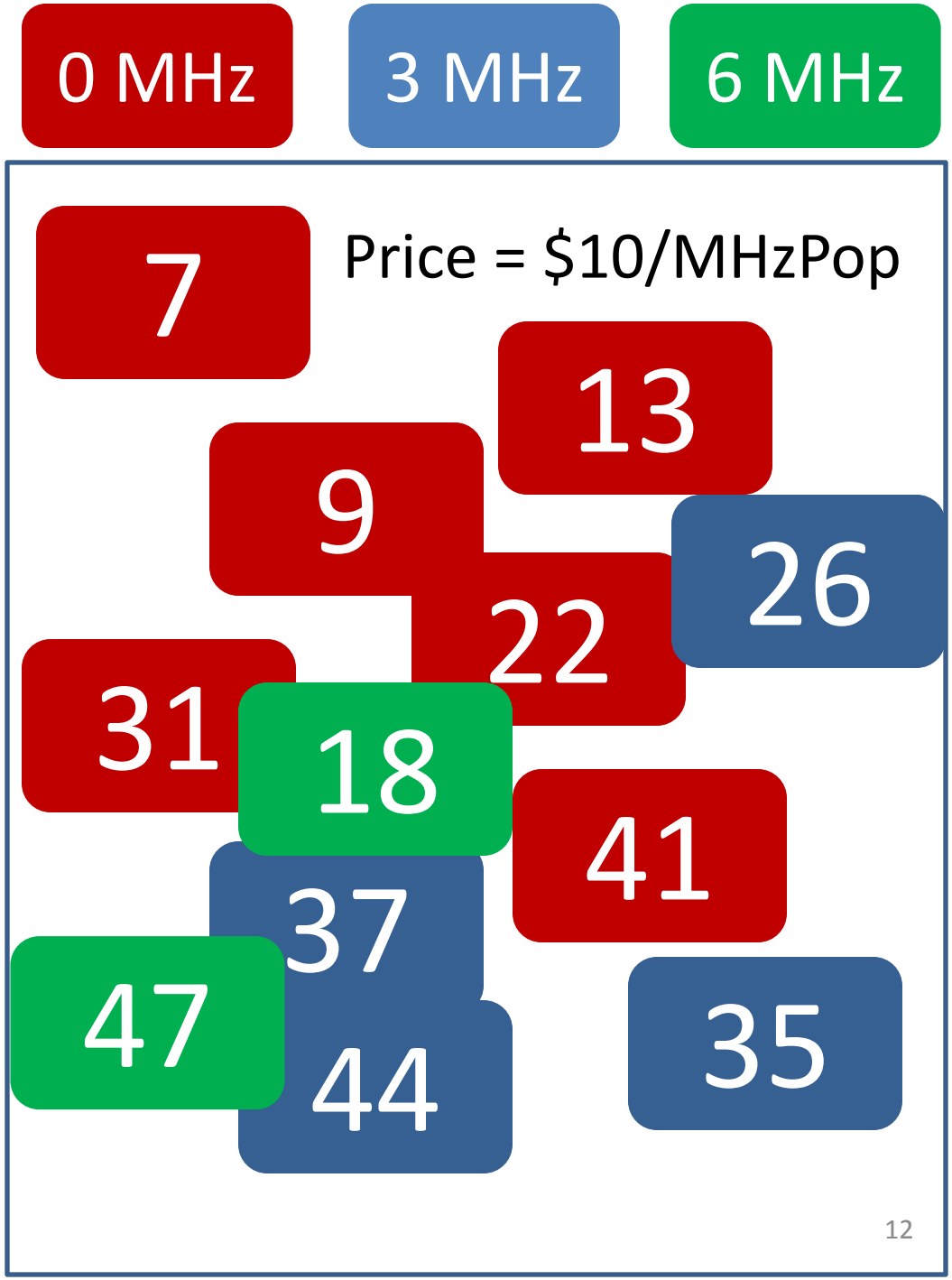


# Washington DC

P = $10

Reverse auction to determine supply

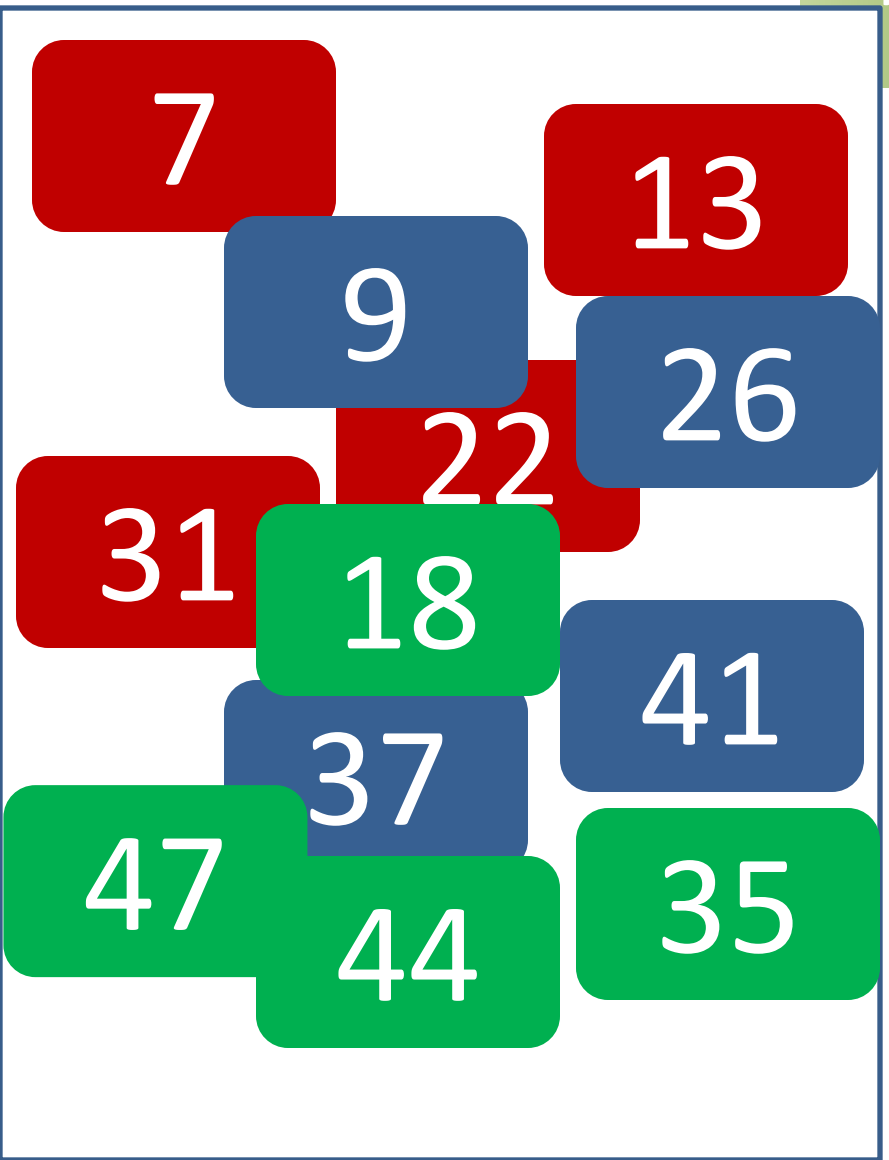
S = 24

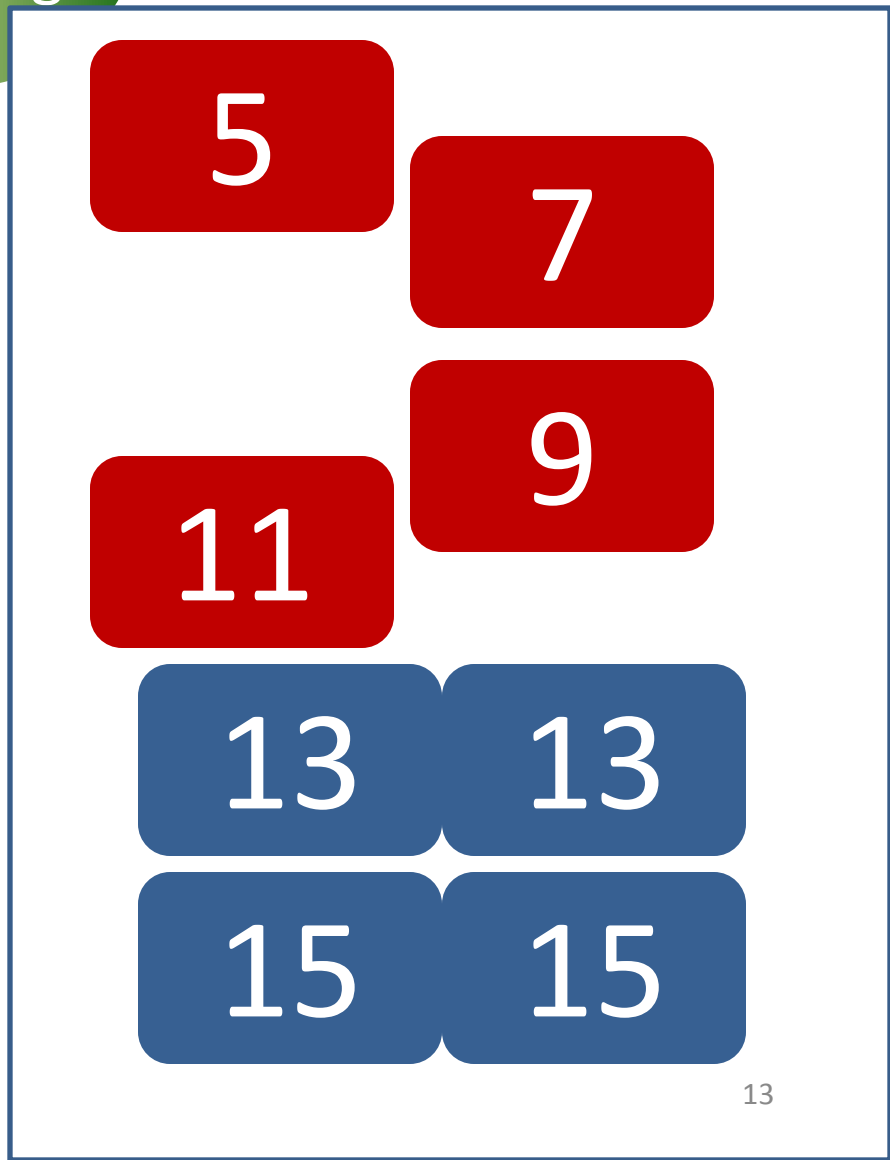


P = $20
S = 36

Mandatory repacking

Supply = 160 MHz



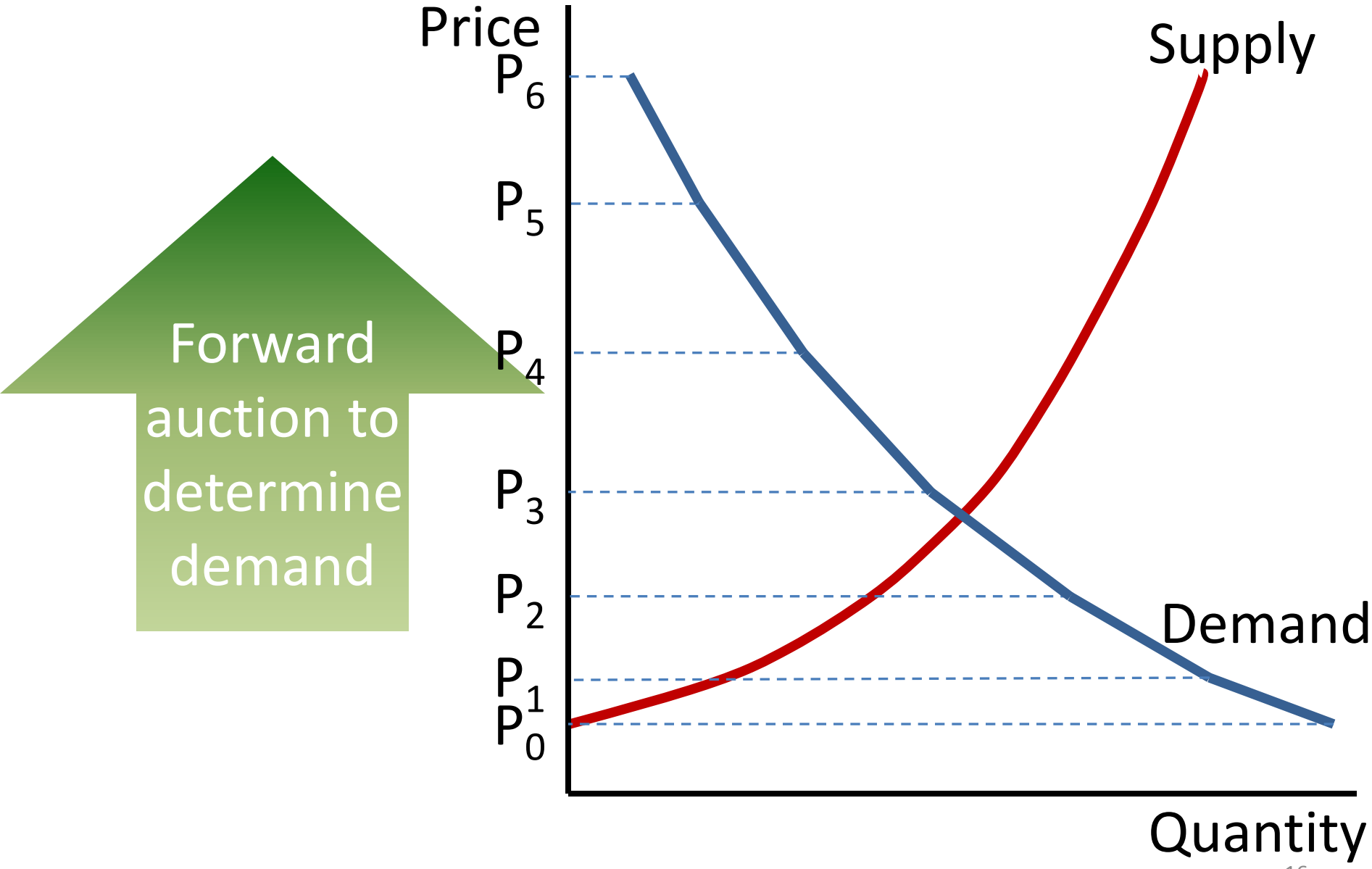

- Mobile operators want large blocks of contiguous paired spectrum for LTE (4G)
  - One to four 2 × 5 MHz lots
- Complementaries strong both within and across regions
- Package clock auction ideal
  - Within region complementarities guaranteed with generic lots
  - Across region complementarities achieved through optimization of specific assignments

# Package clock auction: Overview

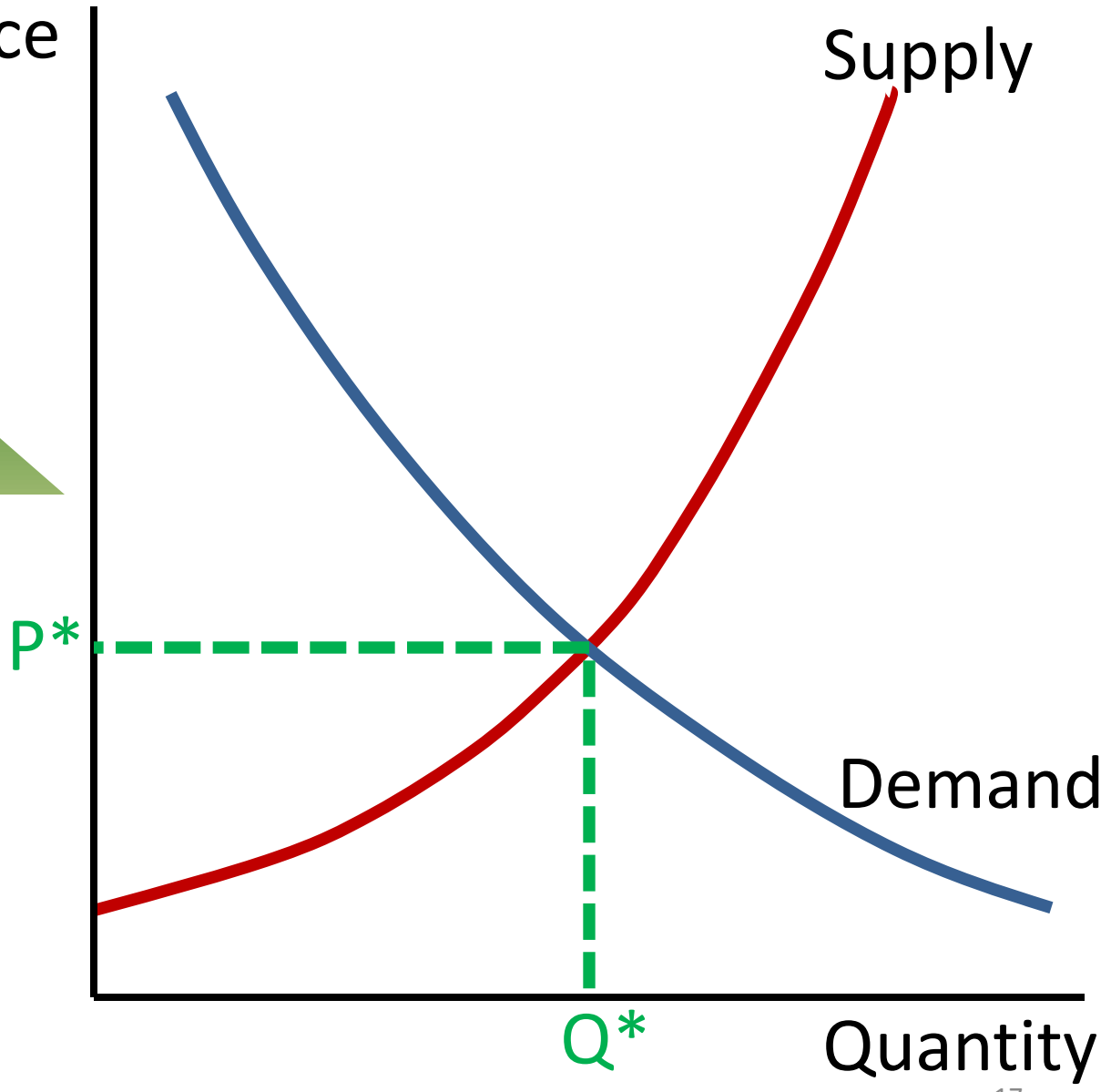
- Auctioneer names prices; bidder names package
  - Price increased if there is excess demand
  - Process repeated until no excess demand
- Supplementary bids
  - Improve clock bids
  - Bid on other relevant packages
- Optimization to determine assignment/prices

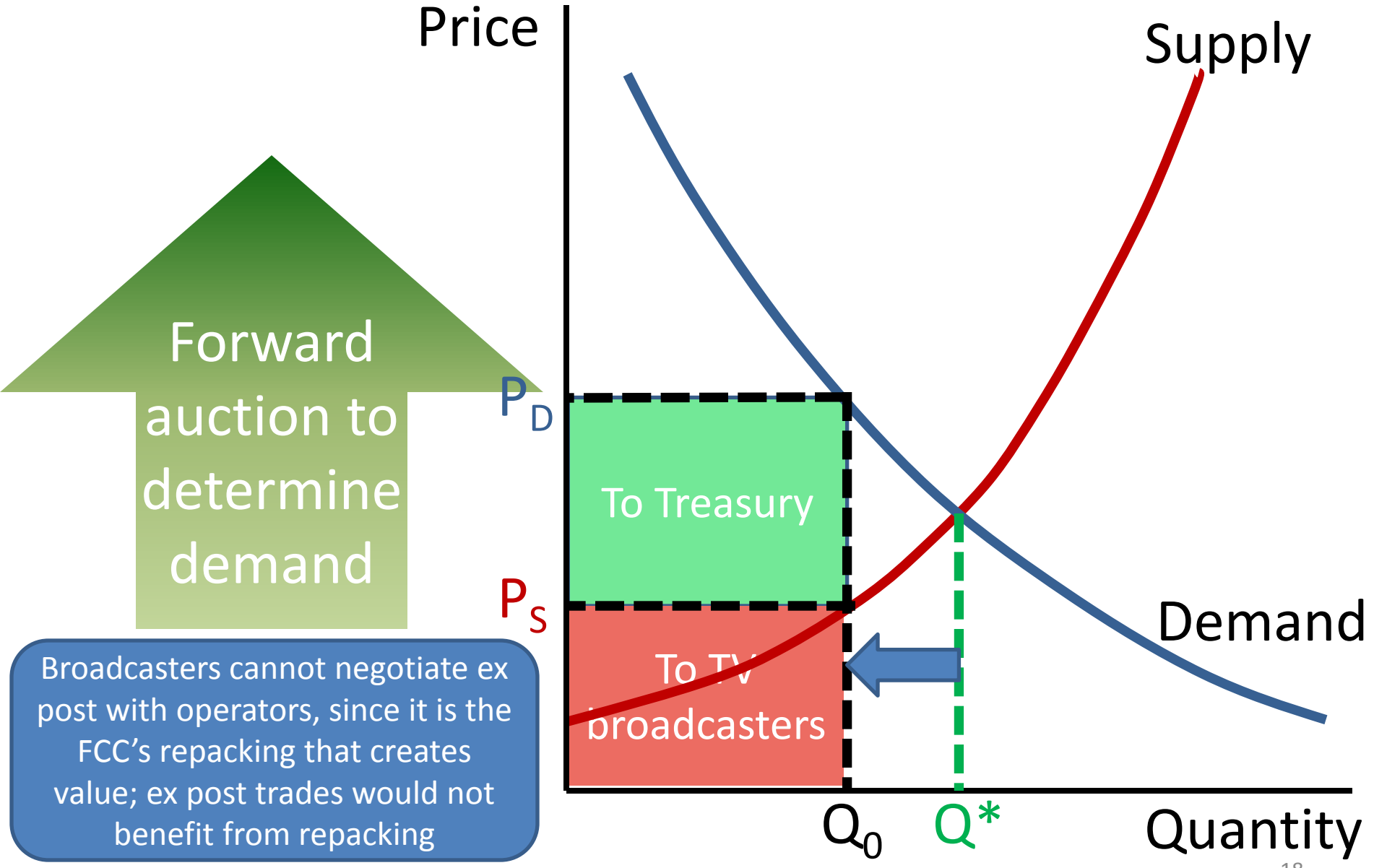
- No exposure problem (package auction)
- Second pricing to encourage truthful bidding
- Activity rule to promote price discovery

*For details see Peter Cramton,* ***"Spectrum Auction Design,"*** Working Paper, University of Maryland, June 2009.


Forward auction to determine demand
Price
$P_6$
$P_5$
$P_4$
$P_3$
$P_2$
$P_1$
$P_0$
Supply
Demand
Quantity

Forward auction to determine demand



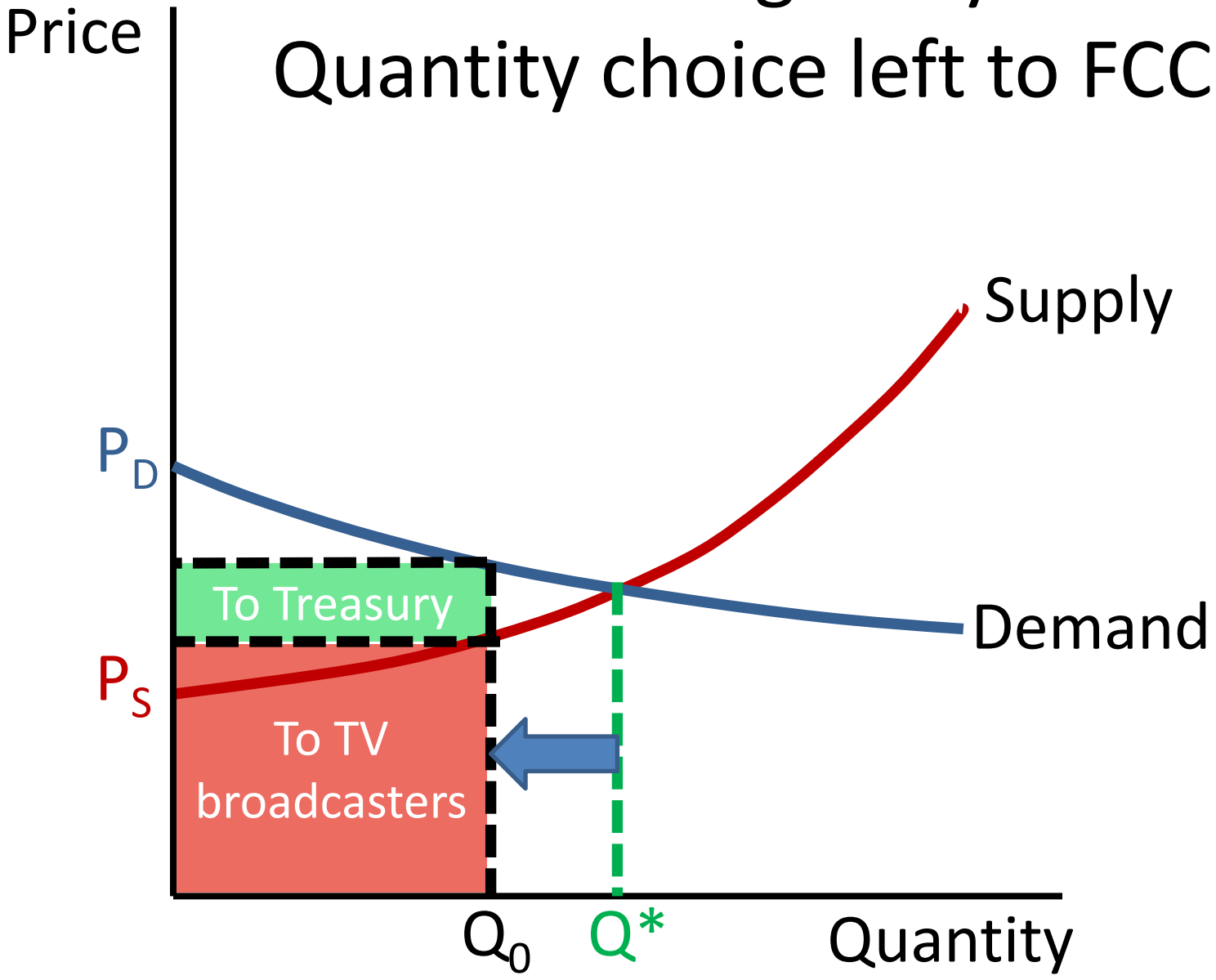



Broadcasters cannot negotiate ex post with operators, since it is the FCC's repacking that creates value; ex post trades would not benefit from repacking

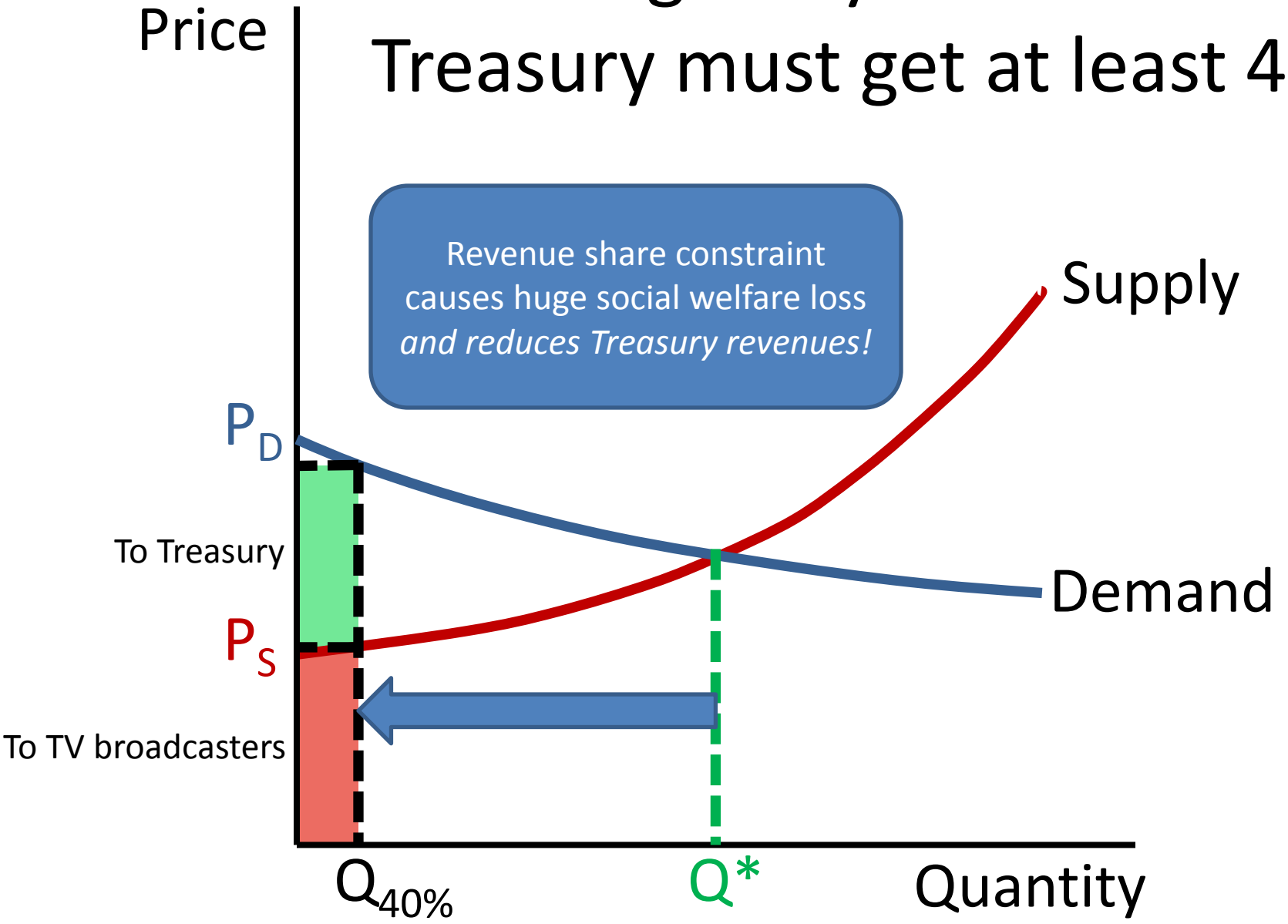
# Ways Congress can screw up

- Impose restrictions on which broadcasters can participate in the auction
  - Destroys competition in reverse auction
- Make repacking purely voluntary
  - Creates holdout problem in reverse auction
  - Reverses status quo—FCC can relocate stations
- Too greedy
  - Impose specific requirement on government revenue share (e.g., Treasury gets 40% of revenue)

# Not too greedy: Quantity choice left to FCC



# Too greedy constraint: Treasury must get at least 40%



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  - Reverses status quo—FCC can relocate stations
- Adopt poor auction design
- Fail to address competition concerns

# Statutory language: Motivation

- Since 1993, the FCC has demonstrated an outstanding ability to design and implement auctions
- As a result of this outstanding record, Congress should provide the FCC with broad auction authority focused on key objectives
  - Transparency
  - Efficiency
  - Protections to assure success

# Statutory language: Objectives

- Transparency
- Efficiency: Put spectrum to its best social use
- Protections to assure program success
- Protections to assure best available science and practice

*Little more than these objectives is needed in legislation given the FCC's strong track record in designing and implementing auctions; details are apt to do more harm than good in this case.*