

“It’s been a 20 year journey for me applying economics to the exchange of rebates for formulary positions.”

July 17, 2025 Presentation WEAI 100th Conference - online

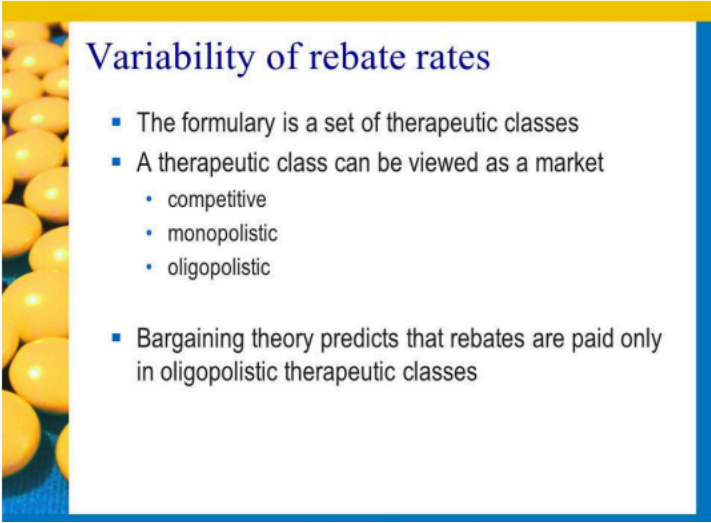
“A Combinatorial Auction Design for Formulary Positions”

By

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July 6, 2005, Presentation WEAI 80th Conference --San Francisco Marriott

“Pharmacy Benefit Managers as Bargaining Agents”



Variability of rebate rates

- The formulary is a set of therapeutic classes
- A therapeutic class can be viewed as a market
 - competitive
 - monopolistic
 - oligopolistic
- Bargaining theory predicts that rebates are paid only in oligopolistic therapeutic classes

My “aha” Moment: 2023 reading of the 1,700 page appendix to the 2019 Grassley-Wyden Senate Staff Report on rebate negotiations between Big 3 PBMs and Big 3 Insulin manufacturers

Three key features of signed rebate contracts in the appendices of the GW Report caught our eye:

1. PBMs offered a combinatorial bid menu featuring both exclusive and shared positions.
2. The standard basis for rebate offers was expressed as a % off unit list prices as measured by the publicly available wholesale acquisition cost (WAC).
3. After 2011, PBMs added to the bid menu an incremental rebate option for outright exclusion of named competing drugs.

2018 - 2020 contract between CVS Caremark and Sanofi with a 15% incremental rebate bid option for outright exclusion of named competitors of Sanofi’s Apidra, a rapid acting glulisine insulin

EXHIBIT C-6
REBATES & ADMINISTRATIVE FEES
 Effective August 1, 2018 through December 31, 2020 (unless otherwise specified below)

A. **Base Rebates – Commercial Plans.** The following Base Rebate Percentages shall be applicable for Products dispensed by a Participating Pharmacy to Members of Commercial Plans:

A-1 Apidra®/Apidra SoloSTAR®:

BASE REBATES FOR APIDRA®/APIDRA® SoloSTAR® (INCLUDES ALL NDCs, STRENGTHS & PACKAGE SIZES)				
Plan Type	1 of 1 Manufacturer Status	1 of 2 Manufacturer Status	Listed Formulary Status	Third Tier Status
Managed Plans - 2T	66.0%	41.0%	36.0%	N/A
Managed Plans - 3T	66.0%	41.0%	36.0%	31.0%
Highly Managed Plans	66.0%	41.0%	38.0%	31.0%
Closed Plans*	66.0%	41.0%	41.0%	31.0%
Incremental Base Rebate For Additional Controls: (Not Applicable to Third Tier Status Rebates)				
One Manufacturer of Competitive Products Excluded				15.0%
Two Manufacturers of Competitive Products Excluded				15.0%

2015 rebate contract bid menu between CVS and Novo Nordisk for its portfolio of insulin drugs. Notice what we consider an anticompetitive bid down for shared position

Exhibit A
Products, Rebates & Administrative Fees
(Percentage Rebates)

The following Rebates and Administrative Fees shall be payable on Product dispensed to Participants by Participating Pharmacies:

Product Name	NDC#	Strength	Package Size	Rebate Based on Formulary Status				Administrative Fee
				EGWP	Listed	1 of 2	Exclusive	
Novolin®	00169-1833-11; 00169-1834-11; 00169-1837-11	All Strengths	10mL	15%	N/A	18%	57.5%	3%
NovoLog®	All NDCs	All Strengths	All Package Sizes	15%	N/A	18%	57.5%	3%
NovoLog® Mix 70/30	All NDCs	All Strengths	All Package Sizes	15%	N/A	18%	57.5%	3%

2019 - 2022 contracted bid menu between OptumRx and Sanofi for drug Lantus
Note how the bid menu has become more complicated with addition of administrative fees and price protection rebates

5.1 PREFERRED

5.1.1 Lantus: (Effective 1/1/2019 through 12/31/2022)

Manufacturer Drug Name: Lantus*				
Benefit Design	Formulary Status	Highly Managed	Managed	Covered
Base Rebate Rate %	1 of 1 manufacturer with Preferred Drugs	75%	65%	50%
Base Rebate Rate %	1 of 2 manufacturers with Preferred Drugs	65%	50%	40%
Base Rebate Rate %	1 of 3 manufacturers with Preferred Drugs	n/a	n/a	26%
Administrative Fee		4.75%	4.75%	4.75%
Price Protection factor		4%	4%	4%
Baseline WAC Date		4/1/18	4/1/18	4/1/18
Price Protection Year Start Date		1/1/19	1/1/19	1/1/19

Applying the descriptions in the Grassley-Wyden Senate Staff Report Appendices to a taxonomy of market designs, we have conceptualized this exchange as a “vernacular” common value combinatorial auction.

A Taxonomy of Market Designs			
Matching	Allocation		
	Assignment	Auction	
		Single Unit	Combinatorial
		Private Value	Common Value
Agawal and Budish, Market Design, NBER Working Papers, 2021 https://www.nber.org/papers/w29367			

A Revenue Comparison of Three Auctions

Company	Revenue	Time	Market Designers
Google Search Ad Position Auction ¹	\$175 Billion	2023	Varian
88 FCC Spectrum Auction ²	\$117 Billion	1994 to 2017	Milgrom Cramton Ausubel
Estimate of Big 3 PBMs revenue (rebates, fees, price protection) for vernacular formulary position auction ³	\$60 Billion	2022	?????

¹ Oberlo, <https://www.oberlo.com/statistics/google-ad-revenue>

² IQVIA, Gross-to-Net, The Use of Medicines in 2023, <https://www.fcc.gov/sites/default/files/spectrum-auctions-program-2018.pdf>

³ FCC, Spectrum Auctions, 2018, p. 15
<https://www.fcc.gov/sites/default/files/spectrum-auctions-program-2018.pdf>

Economic Rationale for Shared Positions

- **Nurture long term competition** = equivalent to “set aside” bid packages in government procurement auctions;
- **Physician and patient choice** - Recognition that therapeutic equivalents are not perfect substitutes;
- **Improve bid elucidation** as its captures the subadditive (marketing and production) value of adding assignments to a formulary position;
- **Winners’ determination equation:** assignments on the combined bases of net unit prices and estimates of expected demand.

A Common Value Auction

The Big 3 PBMs have a good idea about % off list price bid limits based on re-casting of 10-K financials from a net to gross basis

More difficult to estimate is an estimate of the subadditive value of a shared position assignment due to marketing

Novo Nordisk - 2023 Margins on Gross and Net Basis					
	Margins on Net Basis	Margins on Gross Basis		Estimate of	
			Actual GtN Rebates	Diseconomies of Gross Due to Shared Position	
Gross Sales		100%			
Net Sales	100.0%	65.8%	34.2%		
Cost of Sales	15.4%	10.1%	>>>	3%	
Marketing	24.4%	16.1%	>>>	7%	
				10%	
Contribution Margin	60.2%	39.6%			
Max unit rebate	39.8%	60.4%			
Source: Novo Nordisk 2023 Annual Report, p. 50, 55					

A Model of a Combinatorial Auction Design for Formulary Positions

Bid Basis:

% off publicly available wholesale acquisition costs (WAC) -

- Good -- lessens “winner’s curse” - no penalty for poor estimates of market share of shared position assignment
- Bad - facilitated shadow pricing by Pharma, a component of Big 3 PBM collusion to add gross rebates as a basis for the winners’ determination equation

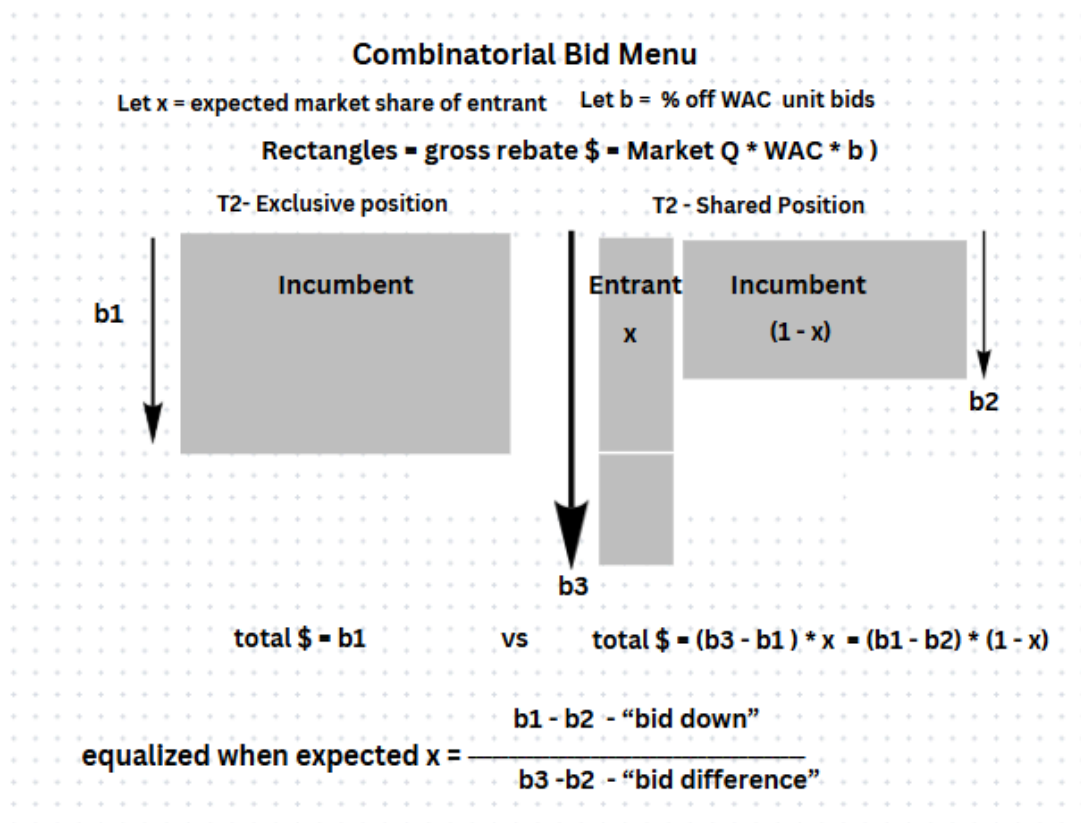
The Winners’ Determination Equation: exclusive vs shared formulary assignment?

- Sum of % off unit bids weighted by market designer’s estimates of market share of assigned position
- The bid down problem:
 - - Even if the entrant offers its drug for free, a PBM still needs the incumbent to fill most of the demand. As a result, the incumbent increases its own bid spread between an exclusive assignment and a shared assignment. And depending on that spread, it is possible that an exclusive assignment has a lower expected benefit cost than a shared assignment even with the entrant’s net price at zero.

A Model of a Combinatorial Auction Design for Formulary Positions

Bid Menu:

Total market = T units					
Estimated entrant shared market share = x					
Combinatorial Bid Menu with no limit on incumbent bid down					
		Rebate as % off WAC			
WAC \$/Unit		Exclusive Tier 2	Shared Tier 2		
WAC	Incumbent	b1	b2		
WAC	Entrant	no bid	b3		

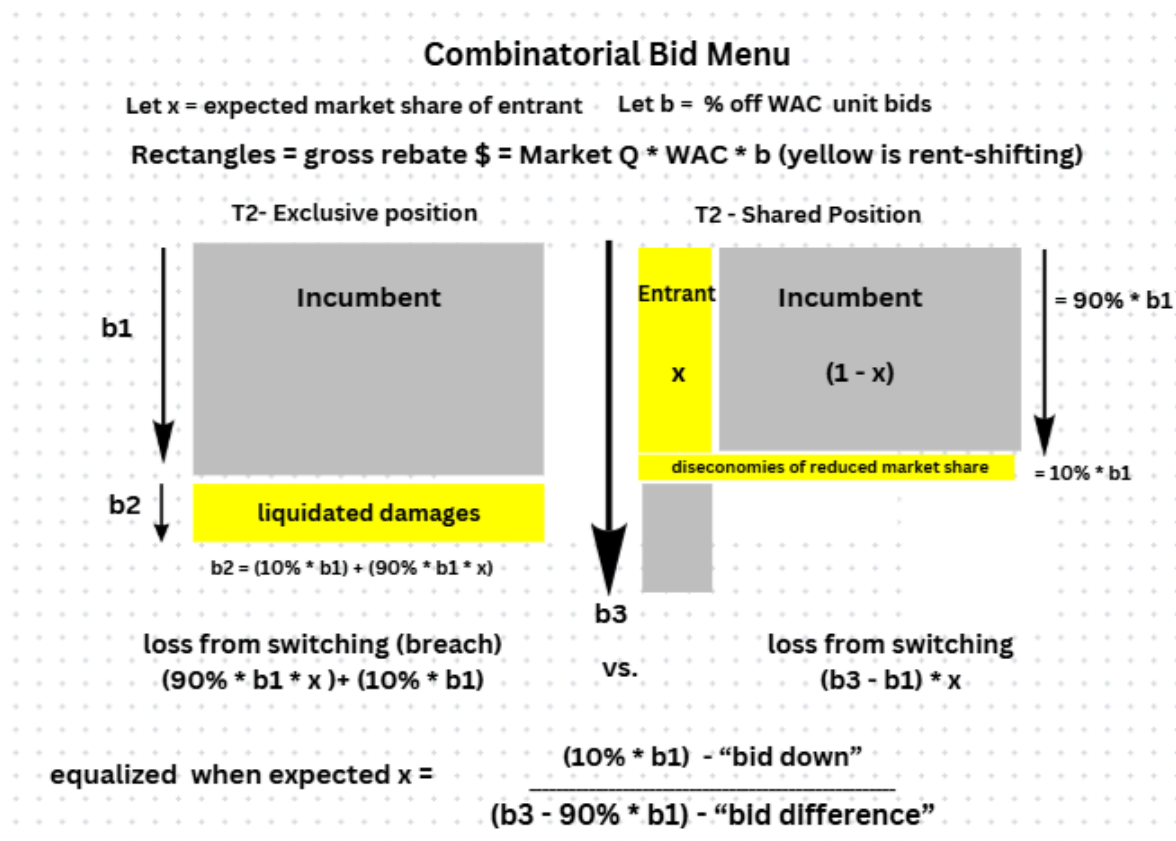


A Model of a Combinatorial Auction Design for Formulary Positions

Extensions:

- Incremental Rebate Option for Outright Exclusion of Named Competitor
- Bid down limits

Combinatorial Bid Menu with incumbent bid down limited to subadditive value of shared position				
replaced by exclusionary liquidated damage bid limited to breach (switch to shared assignment)				
Combinatorial Bid Menu				
Rebate as % off WAC				
WAC \$/Unit		Exclusive T2	Shared T2	
WAC	Incumbent	b1	90%* b1	
WAC	Entrant	no bid	b3	
liquidated damages	Incumbent	b2	n.a.	



The Future: Antitrust Law and Market Design Economics

Lawrence W. Abrams, *A Discovery Plan for Pharmacy Benefit Managers' Collusion*, ANTITRUST CHRONICLE, January 20, 2025

<https://www.pymnts.com/cpi-posts/a-discovery-plan-for-pharmacy-benefit-managers-collusion/>

The Federal Trade Commission (FTC) has recently filed an administrative complaint against the Big 3 pharmacy benefit managers (PBMs) claiming they engaged in unfair conduct in violation of Section 5 of the FTC Act, 15 U.S.C. § 45. They never used the word "collusion" in the complaint and chose not to sue under The Sherman Act, Section 1. We view this as a novel case of market design collusion rather than a case of price collusion. The Big 3 PBMs are conceptualized as auctioneers soliciting rebate bids off unit list prices in exchange for favored positions on formularies.

Adding a Market Design to the Three Party Model of Vertical Contracting

The Coasian Conundrum - who is at fault for anticompetitive assignments -- bidder or market designer?

A Market Design Approach of Platform Position Assignments

- A Remedy to the Google Search Monopolization Case
- Apple Store
- Hospital Group Purchasing Organizations (GPOs)
- Electronic Health Records (EHR Operation Systems)
- Regional Transmission Organizations (RTOs)