

Estimating the Rebate-Retention Rate Of Pharmacy Benefit Managers

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Abstract

The purpose of this paper is to estimate the rebate-retention rate of pharmacy benefit managers (PBMs).

The rebate-retention rate is the ratio of net rebates retained to gross rebates received from drug manufacturers. What isn't retained is passed on to health care plan sponsors. A different estimating approach is required for each component of this ratio. For a variety of reasons, PBMs want to keep this rate a secret and normally bury these figures in aggregate financial statements disclosed to the public.

Recently, Express Scripts, Inc, the second largest independent PBM, changed how it accounted for rebates. This presented a unique opportunity to cut the estimating effort in half because the company was required to disclose gross rebates received for the past three years.

Based in part on this data, we have estimated the rebate-retention rate for Express Scripts to be 31.5%, 35.0%, and 38.0% for fiscal years 2000, 2001 and 2002, respectively.

While the rebate-retention rate is trending up for the company, it appears to be the result of an effort to "capture a larger piece of a shrinking pie." We have estimated that gross rebates received as a percent of drug spending (as measured by the wholesale drug acquisition cost) for Express Scripts to be 20.1%, 12.6% and 11.0% for 2000, 2001, and 2002, respectively.

The two offsetting trends have resulted in a slow growth of net rebate dollars. So much so that we estimate that the fast growing gross profits from mail order operations has caught up to the level of net rebates received by Express Scripts in fiscal 2002. The percentage of gross profits from rebates has been trending down -- 42.2%, 36.3% and 34.9% --- while the percentage from mail order operations has been trending up -- 25.0%, 32.8%, and 34.9% -- during the past three fiscal years.

With the relatively rapid growth of "maintenance drugs" for the elderly that lend themselves to mail order delivery, we believe that mail order will become a more important source of gross profits than retained rebates. PBMs' interest in becoming managers of a Medicare Rx drug benefit program should be viewed more in terms of the likelihood that this program will enhance their mail order operations than in terms of its impact on other sources of profitability.

Disclosure

I do not work for a PBM, chain drugstore, pharmaceutical manufacturer, health care plan sponsor, or school of pharmacy. I have not received any remuneration for any papers published on my Website to date. If I ever do, I will disclose that.

I call it like I see it and expect to be criticized equally by PBMs and chain drugstores.

I have a Ph.D. in Economics from Washington University in St. Louis. However, most of my career has been spent doing cost accounting and financial analysis for companies in Silicon Valley unrelated to the health care sector.

My passion now is deconstructing Form 10-K profit and loss statements. Research in this area is proprietary and focused on investment implications. I will try to make my work available publicly and focus on important public policy issues.

A handwritten signature in black ink that reads "Lawrence W. Abrams". The signature is written in a cursive, flowing style.

Introduction

Almost all health care insurance plans rely on third-party contractors called pharmacy benefit managers (PBMs) to manage the prescription (Rx) drug benefit portion of the plan. Arguments for and against extending Medicare to cover outpatient Rx drugs costs sooner or later will come around to PBMs. What do they do? Where do their profits come from? Why are they interested in managing a Medicare Rx drug benefit plan? Can we insure that they will work in the best interest of Medicare beneficiaries?

The purpose of this paper is to estimate a key measure of PBMs' profitability -- the rebate-retention rate. The rebate-retention rate is the share of gross rebates received from drug manufacturers that is retained by PBMs. The rest is remitted to plan sponsors who use the rebates to defray costs and keep premiums down. We do this for second largest independent PBM—Express Scripts, Inc.—for its last three fiscal years. This choice was based on a unique opportunity that has recently presented itself when, upon the advice of its auditor PriceWaterhouseCoopers, Express Scripts decided to change the way it accounted for rebates. The change necessitated a one-time disclosure of gross receipts of rebates and related fees from drug manufacturers for the past three fiscal years. This information has allowed us to cut our estimating efforts in half and increased our confidence in our estimates. Even so, we present an approach to estimating gross rebate rates in Appendix II for cases where such information is not available.

There are several reasons why PBMs want to keep the rebate rebate-retention rate a secret. First, it gives PBMs an edge in negotiating contracts because clients have no clue as to the range of rates that are obtainable. Another reason is that rebates are highly controversial and have been the focus of many legal challenges. Rebates have been characterized as anti-competitive and as “kick-backs” that are not allowed in the health care industry. One final reason why PBMs prefer to keep details about its sources of profit is to protect their “rising star” mail order operations. The profitability of mail order operations today is low for some PBMs due less than full capacity utilization. Still, PBMs have high hopes for mail order and they shelter this “rising star” by burying its margin in with the margins from rebates.

There will be intense pressure to disclose publicly the rebate-retention rate if market-based Medicare becomes a reality because suddenly a lot of tax dollars will be flowing through PBMs bank accounts. In fact, at the time it changed the way it accounted for rebates, Express Scripts disclosed that it remitted to its clients “ in excess of 50%” of rebates and administrative fees it has received from drug manufacturers in fiscal 2002.¹ This represents the first official public disclosure by a major PBM of the share of gross rebates that is remitted and/or retained. We believe this disclosure shows an increasing realization that it is not in the best interests of PBMs to be so secretive about this number. While this revelation represents only a vague disclosure by a single major PBM, we believe that the trend toward more explicit disclosure will continue. In the meantime, we hope that our estimates will be useful in discussions about the profitability of PBMs and their role in managing a Medicare drug benefit program.

The Sources of PBM Profitability

PriceWaterhouseCoopers has written a very good short history of the evolution of PBMs.² Fifteen years ago the only significant source of revenue for PBMs was claims processing fees. PBMs did not have contractual relations with pharmacies because plan sponsors negotiated directly with pharmacies to set prescription prices. Back then PBMs were known mainly for computerizing claims processing and porting this software to the point-of-sale. Their only focus was minimizing claims processing costs, a goal totally in line with the goals of their clients.

That has changed today. PBM have become principals in contracts involving pharmacies. They now negotiate directly with pharmacies to set reimbursements. A source of gross profits now comes from something called “spread pricing” -- negotiating a reimbursement differential between what PBMs receive from plan sponsors and what they pay pharmacies.

The introduction of the formulary into claims processing software has been another development that has become a source of profits. The formulary is a look-up table that PBMs have added to claims processing systems that checks a prescription request against a list of therapeutic equivalents preferred by the plan

sponsor. The formulary can flag a pharmacist to request that a generic drug be substituted for a higher priced off-patented brand name drug. A formulary also can mandate that a pharmacist call a prescribing physician to seek approval for the substitution of one brand name drug for another in the same therapeutic class. The cost saving occurs when PBMs succeed in aligning most of its clients' formularies around a single brand name drug in a therapeutic class to the point that they collectively "move a market" and garner significant market share rebates (MSRs) from the preferred drug manufacturer. These rebates are paid directly to the PBMs who in turn pass on shares to their plan sponsor clients.

One final source of profitability for the major PBMs has been their Rx drug mail order operations. PBMs have made it a point to emphasize in recent financial statements the dramatic year-to-year growth in mail order revenue. The reason for this growth has been the rapid growth in "maintenance drugs" for the elderly that don't require immediate delivery upon demand. The gross profit margins of PBM mail order operation is a closely guarded secret and may one day replace the rebate-retention rate as the number with the most of interest to outsiders.

How PBMs Account for Rebates

Generally accepted accounting principles (GAAP) govern how companies are supposed to account for revenue and costs. Securities and Exchange Commission (SEC) laws govern how such data is reported to the investing public. PBMs cite in their financial reports three different pronouncements that guide how they account for and report rebates received from drug manufacturers. The first is segment reporting as specified by SEC law. The principle governing segment reporting is to require companies to provide details to the investing public about revenue and costs by each line of business without damaging their ability to compete. PBMs have satisfied this requirement by breaking down their profit and loss statements into two segments. Quoting from Express Scripts 2003 10-K Report:

We are organized on the basis of services offered and have determined we have two reportable segments: PBM services and non-PBM services (defined in Note 1 "organization and operations"). We manage the pharmacy benefit within an operating segment that encompasses a fully integrated PBM service. The remaining operating service lines (SDS and Express Scripts Infusion Services) have been aggregated into a non-PBM reporting segment.³

For the past three fiscal years, non-PBM services accounted for less than 1.5% of Express Scripts' revenue so segment reporting provides little additional information. The major sources of profitability—

rebates, spread pricing, and mail order – remain lumped together in financial statements disclosed to the public. This does not mean that Express Scripts discloses nothing about individual sources. It regularly discloses revenue from mail order operations. And it was forced to make a one-time disclosure of gross revenue from rebates in conjunction with a recent change in how it accounted for rebates. But, this reveals only a part of the puzzle. It takes both revenue and cost figures to calculate gross profit margins. None of the six major PBMs – AdvancePCS, Express Scripts, Caremark, Merck-Medco, Wellpoint, and Aetna --have ever broken out in an official annual report to the SEC both revenue and cost figures from any of the three major sources of profitability.

PBMs usually cite one of two GAAP rules in footnotes explaining how they account for rebates. Until Express Scripts' recent change, all of the six major PBMs cited Emerging Issues Task Force (EITF) Issue No. 99-19 "Reporting Revenue Gross as a Principal versus Net as an Agent". This pronouncement set forth criteria that determined whether a company could report a source of revenue on a "gross basis" with gross receipts as revenue and the portion remitted to clients as costs or on a "net basis" with net receipts retained as net revenue. The auditors of PBMs have determined that they act as agents rather than as principals in handling rebates. Therefore, they should account for rebates on a "net basis". This determination has been challenged.⁴ Reporting rebates on a "net basis" --- as all of the major PBMs except Express Scripts still do --- is sufficient to mask the rebate-retention rate. But, even if PBMs reported rebates on a "gross basis", segment reporting such as it is, would still keep the rebate-retention rate a secret.

In September 2002, the Emerging Issues Task Force released Issue "EITF" No. 02-16, "Accounting by a Reseller for Cash Consideration Received from a Vendor." Under this pronouncement, any consideration received from a vendor is presumed to be a reduction of the prices of the vendor's products and should be characterized as a reduction of cost of sales. Concurrent with the release of its fiscal 2002 Form 10-K on March 28, 2003, Express Scripts early adopted EITF No. 02-16. Assuming revenue and cost only from rebates and reimbursements, it restated its financial statements as follows:

Originally, rebates accounted for as net revenue:
Revenue = RPS + (GRR – RR)
Cost of Sale = RPH

Change:

Revenue: - GRR

Cost of Sale: -GRR

Restated, rebates as reductions in revenue and costs:

Revenue = RPS - RR

Cost of Sale = RPH - GRR

Either way:

$$\begin{aligned} \text{Gross Profits} &= (\text{RPS}-\text{RPH}) + (\text{GRR}-\text{RR}) \\ &= (\text{RPS}-\text{RPH}) + \text{rrr} * (\text{GRR}) \end{aligned}$$

where RPS is reimbursement plus fees from plan sponsors, RPH is reimbursement to pharmacies, GRR is gross rebates received, and RR is rebates remitted, and where rrr is the rebate retention rate.

Express Scripts changed its accounting for rebates from an increase in revenue on a “net basis” to a reduction in revenue and cost on a “gross basis”. It revised its financial statements for the past three fiscal years by reducing revenue and cost of sales by gross rebates received. This change had no effect on gross profits. Even with this change, rebate reductions are aggregated with other revenue and costs streams and a considerable effort is still required to estimate the rebate-retention rate.

Claims Processing Gross Profit Margin

This change in accounting required Express Scripts to disclose gross rebates received for the past three fiscal years. Basically this reduced the unknowns in the gross profit equation to two -- gross profits from claims processing (RPS-RPH) and the rebate-retention rate (rrr). We are stuck with an unsolvable single equation with two unknowns. At best, we could portray our estimates as a “iso-profit” curve – a two dimensional curve representing sets of numbers for the rebate-retention rate and claims processing gross profits that are consistent with the aggregate gross profits of a company. We find this portrayal to be safe but uninteresting. We have come up with some guideposts that we use to narrow our estimates to a single number.

One guidepost comes from an U.S. General Accounting Office (GAO) study of PBMs role in managing government employee health insurance plans:

Administrative fees for plans we reviewed varied but on the average accounted for about 1.5 percent of total plan drug spending in 2001. ...While PBMs contractual arrangement with other plan may differ, the contractual arrangements with the FEHBP-participating plans we reviewed resulted in the PBMs passing through to the retail pharmacies the entire payment that they receive from the plans.⁵

This gives us claims fee revenue from plan sponsors as percentage of claims reimbursements. What are missing are the costs of claims processing and the spread-pricing margin. PriceWaterhouseCoopers has estimated claims processing costs to be between \$.30 and \$.40 a claim with the average claim being around \$60.⁶ This put claims processing costs around .5% to .67% of claim. The gross profit margin from claims processing, excluding spread pricing, becomes .83% to 1% of claim. We add 1.0% spread pricing margin to arrive at an overall gross profit margin from claims processing at around 2.0%.

We use this as a target to fix gross profits from claims (RPS-RPH) in the equation above and this, coupled with the one time disclosure of GRR by Express Scripts, yields a solvable one equation with one unknown – the rebate retention rate. The resulting estimates for the last three fiscal years for Express Scripts is summarized in Table 1. A complete estimate the company's gross profits by source for the last three fiscal years is presented in Tables 2 –4.

The key result is an estimate of the rebate-retention rate for Express Scripts to be 31.5%, 35.0%, and 38.0% for fiscal years 2000, 2001 and 2002, respectively.

While the rebate-retention rate is trending up for the company, it appears to be the result of an effort to “capture a larger piece of a shrinking pie.” We have estimated that gross rebates received as a percent of drug spending (as measured by the wholesale drug acquisition cost) for Express Scripts to be 20.1%, 12.6% and 11.0% for 2000, 2001, and 2002, respectively.

Table 1: Summary of Results

Description	Source	Fiscal Year Ending December 31,		
		2000	2001	2002
Gross Rebates + Fees Received (Thousands \$)	From 10-K Data	810,393	740,782	926,750
Gross Rebates Received (Thousands \$)	estimate	721,250	618,553	755,301
Net Rebate Retained (thousands \$)	estimate	227,194	216,494	287,014
Rebate-Retention Rate	calculated	31.5%	35.0%	38.0%
Gross Rebates as a % of Reimbursements	calculated	15.5%	9.7%	8.5%
Gross Rebates as a % of Drug WAC	calculated	20.1%	12.6%	11.0%
Net Rebates as a % of Total Gross Profit	calculated	42.2%	36.3%	34.9%
Net Mail Order as a % of Total Gross Profit	calculated	25.0%	32.8%	34.9%

The two offsetting trends have resulted in a slow growth of net rebate dollars. So much so that we estimate that the fast growing gross profits from mail order operations has caught up to the level of net rebates received by Express Scripts in fiscal 2002. The percentage of gross profits from rebates has been trending down -- 42.2%, 36.3% and 34.9% --- while the percentage from mail order operations has been trending up -- 25.0%, 32.8%, and 34.9% -- during the past three fiscal years.

With the relatively rapid growth of “maintenance drugs” for the elderly that lend themselves to mail order delivery, we believe that mail order will become a more important source of gross profits than retained rebates. PBMs interest in becoming managers of a Medicare Rx drug benefit program should be viewed more in terms of its impact on their mail order operations than in terms of its impact on other sources of profitability.

Table 2: Express Scripts - Year Ending December 31, 2000
Data from 2000 Form 10-K to the SEC

Column A	Column B	Column C	Column D	Column E	Column F
Row	Source of Column D	Line Item Description	Thousands \$	% of Revenue	
		Revenue:			
1	D6-sum(D2:D5)	Network Revenue	4,659,061	76.4%	
2	G17*C8 with F16 as guide	Less: Rebates Remitted	(494,056)	-8.1%	
3	10-K Data	Mail Order Revenue	1,681,648	27.6%	
4	10-K Data	Service Revenue	166,359	2.7%	
5	10-K Data	Non-PBM Revenue	88,044	1.4%	
6	10-K Data		6,101,056	100.0%	
		Costs and expenses:			
7	D14-sum(D8:D13)	Network Costs	4,566,480		
8	(10-K data) - D9	Less: Rebates Received	(721,250)		
9	.185* (10-K Data)	Less: Data & Admin Fees Rcvd	(89,143)		
10	-D9	Rebate Admin Costs	89,143		
11	.92*D3	Mail Order Costs	1,547,116		
12	.655*D4	Service Costs	108,965		
13	10-K Data	Non-PBM	60,777		
14	10-K Data		5,562,089	91.2%	
15	10-K Data	Gross Profit	538,967	8.8%	
		Gross Profit		% of	
16	D1-D16	Spread + Fees	92,581	Gross Profit	17.2%
17	-D2-D8	Net Rebates	227,194	% of Claims	2.0%
18	D3-D11	Mail Order	134,532		4.9%
19	D4-D12	Services	57,394		
20	D5-D13	Non-PBM	27,267		
21	sum(d16:d20)		538,967	100.00%	6.9%
		Various Derived Rates			
22	-(D17 / D8)	Rebate-retention rate	31.5%		
23	-((D17-D9) / (D8+D9))	Rebate+Data Fee Retention rate	39.0%		
24	-(D8 / D1)	Gross rebates as a % of claims	15.5%		
25	D24/.77	Gross rebates as a % of WAC	20.1%		
26	-(D9 / D1)	Admin Fees as a % of claims	1.9%		
27	D26/.77	Admin Fees as a % of WAC	2.5%		
28	D27/.837	Admin Fees as % of submitted WAC	3.0%		

**Table 3: Express Scripts - Year Ending December 31, 2001
Data from 2001 Form 10-K to the SEC**

Column A	Column B	Column C	Column D	Column E	Column F
Row	Source of Column D	Line Item Description	Thousands \$s	% of Revenue	
		Revenue:			
1	D6-sum(D2:D5)	Network Revenue	6,379,800	74.3%	
2	G17*C8 with F16 as guide	Less: Rebates Remitted	(402,059)	-4.7%	
3	10-K Data	Mail Order Revenue	2,441,646	28.4%	
4	10-K Data	Service Revenue	94,345	1.1%	
5	10-K Data	Non-PBM Revenue	74,268	0.9%	
6	10-K Data		8,588,000	100.0%	
		Costs and expenses:			
7	D14-sum(D8:D13)	Network Costs	6,254,677		
8	(10-K data) - D9	Less: Rebates Received	(618,553)		
9	.185* (10-K Data)	Less: Data & Admin Fees Rcvd	(122,229)		
10	-D9	Rebate Admin Costs	122,229		
11	.92*D3	Mail Order Costs	2,246,314		
12	.655*D4	Service Costs	61,796		
13	10-K Data	Non-PBM	47,898		
14	10-K Data		7,992,132	93.1%	
15	10-K Data	Gross Profit	595,868	6.9%	
		Gross Profit		% of	
16	D1-D16	Spread + Fees	125,124	Gross Profit 21.0%	% of Claims 2.0%
17	-D2-D8	Net Rebates	216,494	36.3%	3.4%
18	D3-D11	Mail Order	195,332	32.8%	
19	D4-D12	Services	32,549	5.5%	
20	D5-D13	Non-PBM	26,370	4.4%	
21	sum(d16:d20)		595,868	100.00%	5.4%
		Various Derived Rates			
22	-(D17 / D8)	Rebate-retention rate	35.0%		
23	-((D17-D9) / (D8+D9))	Rebate+Data Fee Retention rate	45.7%		
24	-(D8 / D1)	Gross rebates as a % of claims	9.7%		
25	D24/.77	Gross rebates as a % of WAC	12.6%		
26	-(D9 / D1)	Admin Fees as a % of claims	1.9%		
27	D26/.77	Admin Fees as a % of WAC	2.5%		
28	D27/.837	Admin Fees as % of submitted WAC	3.0%		

Table 4: Express Scripts - Year Ending December 31, 2002
Data from 2002 Form 10-K Report to the SEC

Column A	Column B	Column C	Column D	Column E	Column F
Row	Source of Column D	Line Item Description	Thousands \$s	% of Revenue	
		Revenue:			
1	D6-sum(D2:D5)	Network Revenue	8,883,573	72.5%	
2	G17*C8 with F16 as guide	Less: Rebates Remitted	(468,287)	-3.8%	
3	10-K Data	Mail Order Revenue	3,594,989	29.3%	
4	10-K Data	Service Revenue	86,862	0.7%	
5	10-K Data	Non-PBM Revenue	163,497	1.3%	
6	10-K Data		<u>12,260,634</u>	100.0%	
		Costs and expenses:			
7	D14-sum(D8:D13)	Network Costs	8,709,516		
8	(10-K data) - D9	Less: Rebates Received	(755,301)		
9	.185* (10-K Data)	Less: Data & Admin Fees Rcvd	(171,449)		
10	-D9	Rebate Admin Costs	171,449		
11	.92*D3	Mail Order Costs	3,307,390		
12	.655*D4	Service Costs	56,895		
13	10-K Data	Non-PBM	118,717		
14	10-K Data		<u>11,437,216</u>	93.3%	
15	10-K Data	Gross Profit	823,418	6.7%	
		Gross Profit		% of	
16	D1-D16	Spread + Fees	174,057	Gross Profit	21.1%
17	-D2-D8	Net Rebates	287,014		2.0%
18	D3-D11	Mail Order	287,599		3.2%
19	D4-D12	Services	29,967		
20	D5-D13	Non-PBM	44,780		
21	sum(d16:d20)		<u>823,418</u>	100.00%	5.2%
		Various Derived Rates			
22	-(D17 / D8)	Rebate-retention rate	38.0%		
23	-((D17-D9) / (D8+D9))	Rebate+Data Fee Retention rate	49.5%		
24	-(D8 / D1)	Gross rebates as a % of claims	8.5%		
25	D24/.77	Gross rebates as a % of WAC	11.0%		
26	-(D9 / D1)	Admin Fees as a % of claims	1.9%		
27	D26/.77	Admin Fees as a % of WAC	2.5%		
28	D27/.837	Admin Fees as % of submitted WAC	3.0%		

Appendix I: Estimating the Gross Profit Margins of Mail Order Operations.

We start with a 22% estimate for the gross profit margin of retail pharmacies for 1999 provided by John Coster of the National Association of Chain Drug Stores.⁷ This is an weighted average of margins on “cash only” sales and margins on sales covered by health insurance plans. Coster estimated that the distribution of retail pharmacy sales between “cash-only” and covered to be 18% and 82%, respectively.

Next, we obtain estimates of the average discount of reimbursement prices to “cash only” prices and the average discount of mail order prices to “cash only” prices. A recent GAO study of the Federal Employee Health Benefits Plans (FEHBP), whose drug benefits are managed by private sector PBMs, provides estimates of these discounts.⁸ The study found that the discount of reimbursement prices to “cash only” prices averaged 18% and 47% for brand name drugs and generics, respectively. Assuming that brand name drug sales are 75% of total sales, this translates into an overall average discount of 25%.

Using this number, we can disaggregate the overall 22% gross profit margin for retail pharmacies into the margins on “cash only” sales and covered sales.

$.18 * (X) + .82 * (.75 * X) = 22\%$ where X is the gross profit margin of “cash only” sales and $.75 * X$ is the gross profit margin of covered sales. Solving for X results in an estimate of 28% for the margin on “cash only” sales and 21% for the margin on covered sales.

Since mail order is almost exclusively covered sales, we use the 21% gross profit margin on covered sales by retail pharmacies as a starting point. The GAO study mentioned earlier provided estimates of the discount of mail order prices to “cash only” prices. The study found that mail order prices averaged of 27% and 53% lower than “cash only” prices for brand name drugs and generics, respectively. This translates into an overall average discount of 34%, assuming that brand name drug sales are around 75% of total sales. Based on the difference in discounts from “cash only” prices, we estimate that reimbursement prices paid to mail order operations to be 9 percentage points less than reimbursements

paid to retail pharmacies. This results in an estimate of the average gross profit margin on mail order operation of PBMs to be $21\% - 9\% = 12\%$.

Appendix II: Estimate the Gross Rebate Received as a % of WAC

Market Share Rebate Schedules

The rebate retention rate is the ratio of retained rebates to gross rebates received. The two components of this ratio are estimated independently. In this section, we present an original approach to estimating the denominator of this ratio -- the gross rebates received as a percentage of wholesale drug acquisition costs (WAC).

Rebates from drug manufacturers to PBMs generally fall into two categories: (1) volume or access fees, and (2) market share rebates (MSR). Brand name drug manufacturers pay volume fees to PBMs if an individual drug achieves a non-exclusive preferential status in a formulary. One source of estimates for rebates come from a PriceWaterhouseCoopers study for the government. This study is close to being an "insider report" as PriceWaterhouseCoopers is the auditor of most of largest PBMs.

Rebates typically represent a discount of 5% to 15% of drug costs and administrative fees an additional 1% to 3%.⁹

The study confirms that manufacturers pay rebates on the basis of WAC. However, the study fails to clarify whether its estimates are for volume rebates or market share rebates or both.

We start the process of estimating MSRs with estimates of rate schedules presented to PBMs by drug manufacturers. These rebates are structured as a tiered system of percentages that are a function of the market swing above a baseline market share the PBMs deliver. Since MSRs are based on the aggregate share delivered by PBMs, they create a situation where formulary choices of individual plan sponsors affect the payoff of other plan sponsors who have contracted with the same PBM. They know that negotiating MSRs directly with plan sponsors would result in a lot of money paid for closed but mutually

exclusive formularies with no net impact on aggregate market shares. The goal of drug manufacturers is not merely closed formularies, but closely aligned formularies.

We think that a manufacturer starts out by asking what is it willing to pay for, say a 1%, increase in sales for a particular drug it manufactures. The most a manufacturer is willing to pay is the “contribution margin” --- price minus variable costs of sale -- minus some target pre-tax earning rate. Using figures from the latest quarterly reports of one of the big patented drug manufacturers, Pfizer, we can translate this formula into specific numbers.¹⁰ Pfizer reported the following rates and margins: cost of good sold (COG) of 15% (with a complementary gross profit margin of 85%); sales, general, and administrative (SG&A) --49%; and earning before interest and taxes (EBIT) -- 36%. Assuming COG is the sum of a variable cost of sale of 5% and a fixed cost production rate of 15%, then the contribution margin would be 95% and the willingness-to-pay, or contribution margin less EBIT, would be 95% minus 36% = 59%. The rebate that this manufacturer would be willing to pay for 1% increase in sales would be 1% times (95% minus 36%) = .59%.

What remains to be done is to translate rates of increase in the manufacturer's sales – which is the same as the whole acquisition cost (WAC)-- into swings delivered by a PBM. This requires the manufacturer to set some baseline level of sales for the PBM and then to calculate that baseline as a percentage of the total sales (“baseline share”) for that drug by the manufacturer. Assume for example that the baseline market share of company's sales managed by a PBM is set at 20%. Then a 10 point swing delivered by a PBM means a 2% increase in the total sales of the company. The PBM is rewarded with a MSR equal to .59% of the total sales of the drug for the company multiplied by two. This is equivalent to 5.9% of the drug sales or WAC controlled by the PBM.

In general the PBM rebate rate as a function of swing is = (swing) * (rebate margin). Thus a 10-point swing is rewarded by a 5.9% rebate; a 20-point swing is rewarded by an 11.8% rebate; a 30-point swing is rewarded by a 17.7% rebate; etc.

The Situations in Which Rebates Are Offered

Brand name drug manufacturers offer MSRs only when their product faces competitive alternatives. This condition is present in a small number of therapeutic classes. When the competition is present, it is between “blockbuster” drugs whose sales are significant contributors to the profitability of the biggest names in pharmaceuticals. For example, there is an intense battle currently going on between two patented drugs in the cholesterol-reducing therapeutic class: Pfizer’s Lipitor and Merck’s Zocor. Their market share is 42% and 32%, respectively, of an \$18.8 Billion dollars market.¹¹ We estimate that this single therapeutic class, one of maybe 60-100 classes in a formulary, could generate as much as one-quarter of MSRs paid by all brand name drug manufacturers.

Drugs can be classified as facing one of three possible competitive situations:¹²

- (1) A single patented drug with no therapeutic equivalents (no substitution)
- (2) The set of patented and off-patented drugs facing competition from other drugs that are therapeutic equivalents (close substitution)
- (3) The set of generic drug (perfect substitutes)

A Congressional Budget Office study has estimated the distribution of retail pharmacy sales in 1994 by competitive situation. The study found that 55.5% of all retail pharmacy sales represented single source patented drugs with no therapeutic equivalents; 27.2% represented therapeutic equivalents with close substitutes, and the remaining 17.3% represented generics.

Brand drug manufacturers pay volume rebates for all drugs in class (1) and class (2). This means that volume rebates of between 3% and 5% are paid on 82.7% of WAC by health care plans. There is no reason for MSRs to be paid in case (1) because there is no competition. In case (3), generic drug manufactures historically have negotiated rebates with chain drugstores and buyer co-ops because substitutability comes into play in purchasing choices at the wholesale level and not choices involving the formulary design. MSRs are paid only for patented drugs in case (2). When a drug goes off patent, low

cost generic competition appears soon after. MSRs are not offered on off-patented drugs because generic alternatives are so cheap that drug companies would lose money offering rebates necessary to offset this cost difference. Assuming an 80/20 division between patented and off-patented WAC in case (2), this means that MSR are paid on 27.2% of WAC.

Table 5 presents our estimates for gross receipts from rebates. The table reveals several interesting aspects to MSRs. While a MSR for a particular drug can be four times that of a volume rebate, the two types of rebates yield similar returns as measured by the percentage of all drug WAC. Because MSRs are paid only on a small percentage of drug costs, large differences in MSR rates garnered by PBMs, due to varying abilities to motivate their clients to close formularies, have little impact on overall gross receipts from rebates.

Table 5: An Estimate of the Gross Rebates Received as a % of Total WAC

(1) Volume rebate-rate %	5.0%
(2) % of drug WAC paid	82.7%
(3) MSR %	20.0%
(4) % of drug WAC paid	27.2%
(5) Volume rebate earned (1)*(2) As a % of all drug WAC	4.1%
(6) MSR earned (3)*(4) As a % of all drug WAC	5.4%
(7) Gross earnings from rebates as a % of all drug WAC (5)+(6)	9.5%

It is interesting to compare the above estimate with estimates obtained for Express Scripts using explicit data for gross rebate dollars received. For Express Scripts, we have estimated that gross rebates received as a percentage of total WAC to be 20.1%, 12.6% and 11.0% for 2000, 2001, and 2002, respectively. While our component approach yielded an estimate 13.6% less than the Express Scripts estimate for 2002, it was a whopping 57% below the Express Scripts estimate for 2000. The 20.1% gross

rebate rate for 2000 seem way out of line. It would be achievable only with volume rebates way above 5% and MSRs around 30% paid on more than 30% of WAC. This seems impossible. And furthermore, the change in conditions required to produce the dramatic year-to-year drop from 20.1% to 12.6% seem so extraordinary that the accuracy of the 20.1% estimate for 2000 is again questioned.

Notes:

- (1) Securities and Exchange Commission, **Form 10-K**, Express Scripts, Inc for the Year ending December 31, 2002.
- (2) PriceWaterhouseCoopers LLP, **Study of Pharmaceutical Benefit Management**, HCFA Contract No. 500-97-0399/0097, June 2001 p 19-26.
- (3) Securities and Exchange Commission, **Form 10-K**, Express Scripts, Inc for the Year ending December 31, 2002.
- (4) Lawrence W. Abrams, "The Formulary Game", unpublished paper, February 2003.
- (5) U.S. General Accounting Office, **Effects of Using Pharmacy Benefit Managers on Health Plans, Enrollees, and Pharmacies**, GAO-030-196, January 2003., p..26-34
- (6) PriceWaterhouseCoopers, p. 5.
- (7) John M. Coster, " Pharmaceutical Marketplace Dynamics," NACDS, May 31, 2000.
- (8) U.S General Accounting Office, p. 10-11.
- (9) PriceWaterhouseCoopers, p. 19.
- (10) Securities and Exchange Commission, **Form 10-K**, Pfizer, Inc for the Year ending December 31, 2002.
- (11) John Simon, "The \$10 Billion Pill," **Fortune** Volume 147 No. 1, January 2003.
- (12) Congressional Budget Office, **How Increased Competition from Generic Drugs has Affected Prices and Returns in the Pharmaceutical Industry**, July 1998 Chapter 3.