

Are Affiliated Pharmacies Paid More by PBMs? A Review of the Tennessee Audit

Dr. George S. Ford*

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Pharmacy Benefit Managers (“PBMs”) are administrators that process prescription drug claims and negotiate pricing on behalf of employers, municipalities, labor unions, health plans, and Medicare Part D programs. These entities contract with pharmaceutical manufacturers and retail pharmacies to manage formularies, process prior authorizations, negotiate prices and rebates with manufacturers and pharmacies, and control costs for their clients across the prescription drug supply chain. PBMs also handle plan design, eligibility verification, and clinical oversight programs to balance medication access with cost-effectiveness for the millions of Americans they serve.

Since their operations often occur behind the scenes, PBMs remain largely unseen to patients. Yet, PBMs are not invisible to drug manufacturers and pharmacies as PBMs’ cost-reducing efforts impact the profits of these entities. In recent years, both drug manufacturers and independent pharmacies have promoted increased regulatory scrutiny and reform initiatives at both federal and state levels to curb PBMs’ efforts to control costs, meeting with some success.¹

One portion of the regulatory narrative is that many PBMs operate mail-order pharmacies or are otherwise affiliated either with major retail pharmacies or even insurance companies themselves. For example, many people point to CVS Health, an insurer, which operates both CVS pharmacies and a PBM (with a market share of

about 21%).² This integrated structure leads to claims by independent pharmacies, supported by organizations like the National Community Pharmacists Association, that PBMs systematically favor PBM-affiliated pharmacies with higher payments to their own pharmacies (a reimbursement rate) for identical prescription drugs.

The evidence from the Tennessee audit supports the hypothesis that affiliated pharmacies receive lower (not higher) reimbursement rates than unaffiliated pharmacies.

Evidence supporting this claim is sparse. In a recent Senate hearing on PBMs in the healthcare marketplace, a senator pointed to the findings of a Tennessee state audit of Express Scripts (a mail-order pharmacy) which concluded that PBMs’ affiliated pharmacies receive higher reimbursements.³ Tennessee law prohibits the “pattern or practice” of differential treatment of affiliated pharmacies in reimbursements, and compliance may be assessed by audit.⁴

In this PERSPECTIVE, I review the results of Tennessee’s audit and demonstrate that the auditor’s findings, which were based on rudimentary analysis and incorrect baseline for equal treatment, are precisely backwards. The evidence from the Tennessee audit supports the

hypothesis that affiliated pharmacies receive lower (not higher) reimbursement rates than unaffiliated pharmacies.

The Tennessee Law

When an uninsured patient buys a prescription drug, the pharmacy receives from the patient whatever price it sets, and presumably such prices are established in a workably competitive market. When an insured patient fills a prescription, the money received by the pharmacy has several components. From the insurance company or government health plan (often through the PBM), the pharmacy receives a dispensing fee and an ingredient cost reimbursement fee. The dispensing fee compensates for the professional services involved in verifying the prescription, checking for drug interactions, counseling the patient, and maintaining records. The ingredient cost reimbursement covers the cost of the drug. Additionally, based on insurance benefit design, some portion of the dispensing fee and ingredient cost is paid by the patient as cost-sharing. The total compensation received by the pharmacy equals the dispensing fee, the reimbursement rate, plus the patient's out-of-pocket payment.⁵

At issue here is the reimbursement fee. Tennessee law prohibits the differential treatment of affiliated pharmacies in reimbursements. Specifically, Tennessee law requires that a

covered entity or pharmacy benefits manager shall not engage in a *pattern or practice* of reimbursing pharmacies or pharmacists in this state less than the amount that the pharmacy benefits manager reimburses a pharmacy benefits manager affiliate for providing the same drug or dispensed product or service.⁶

The law does not require that all pharmacies receive the same reimbursement rate for transactions of a particular drug. Instead, the law requires that there is no “pattern or practice” of differential treatment.

A “pattern or practice” is a legal term of art from discrimination law that implies systematic discrimination, not an isolated or sporadic incident but a repeated, routine, or generalized pattern of behavior.⁷ Detecting a pattern or practice of discrimination requires an accounting for all legitimate factors that may influence decisions. Establishing a “pattern or practice” of paying an affiliate more requires more than the mere observation that it sometimes happens. For instance, in assessing discrimination in hiring practices, differences in wages related to education and experience are not discriminatory.⁸

Tennessee law also regulates the dispensing fee.⁹ Here, differential pricing, presumably related to costs, is embedded into the law. A 2023 notification from the Tennessee Department of Finance and Administration lists the Pharmacy Distribution Fee (“PDF”)—*i.e.*, the dispensing fee—for the state’s Medicaid State Plan.¹⁰ As examples, the PDF for ambulatory pharmacies (a retail pharmacy) with volumes of less than 65,000 prescriptions is \$13.16, while pharmacies with volumes more than that amount have a PDF of \$9.02—a difference of about 30% based on sales volume.¹¹ For compounded prescriptions prepared in 15 minutes or less, the low-volume pharmacies receive \$13.16 and the high-volume pharmacies \$10.00. Pharmacies that did not provide usable responses to the 2023 Cost of Dispensing Survey and two prior mandatory surveys have a PDF of \$5.00. Also, the PDF for specialty drugs for all pharmacies is \$52.46, and for blood clotting factors and other blood products reimbursement is \$172.69. Thus, Tennessee law requires differential treatment across volumes, prescription types, and regulatory compliance. Explicitly, uniformity in the PDF is not the policy, but is allowed to vary based on factors deemed legitimate by the legislature.

Reimbursement fees may also vary among pharmacies for several legitimate business reasons, including sales volume, location, and

whether a pharmacy is “in network” or “out of network” (a common practice in health insurance to keep costs down).¹² A “pattern or practice” can only be established by evidence of a routine differential treatment of affiliated pharmacies conditioned on legitimate business practices. If volume was the only relevant factor, for instance, then a “pattern or practice” may be established by observing that affiliated pharmacies routinely receive higher reimbursements than unaffiliated pharmacies with the same sales volumes. Ignoring sales volume leads to biased estimate of rate differentials (an omitted variables problem).

The standard approach for establishing a “pattern or practice” in discrimination law is to compare the conditioned means between relevant groups. For example, in wage discrimination the question is not whether men and women have different mean wages, but rather do men and women with the same education and experience (and so forth) have different mean wages? Answering this question typically involves multivariate regression analysis. The Tennessee auditor did not employ such an approach and avoided statistical analysis altogether.

The Tennessee Audit

Under Tennessee law, the reimbursement rates paid to pharmacies may be subject to a state audit. One such audit occurred in 2023 for Express Scripts (which operates a mail-order pharmacy).¹³

In assessing differential treatment, the Tennessee auditor compared “maximum reimbursements of 2,318 unique dosages and medications filled by affiliate and non-affiliate pharmacies within similar timeframes.” From this rudimentary comparison, the auditor found that the “company paid its affiliate pharmacies more than non-affiliates for 568 of the 2,318 medications (24%).” By the same token, the company paid its affiliate pharmacies the *same or less than* non-affiliated 76% of the time, a transparently important fact unmentioned in the audit.

Notably, this simple comparison of reimbursement rates does not condition the rate comparison on legitimate business concerns, which is the standard approach in establishing a pattern or practice. Express Scripts told the auditor that “reimbursement models differ across various pharmacy types,” which the auditor interpreted as evidence of discrimination. Yet, Tennessee law imposes a model of different dispensing fees across various pharmacy types, which presumably is not discriminatory but somehow cost based. The auditor’s conclusion is also the equivalent of saying a company’s practice of setting wages based on education and experience is discriminatory, which it is not. Notably, it does not appear that the auditor reviewed Express Scripts’ reimbursement model—a review that would seem to precisely identify any preferential treatment.

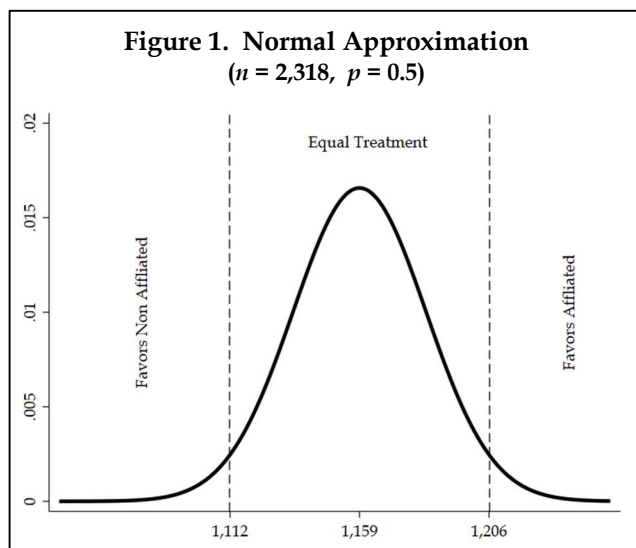
*Under equal treatment of affiliated and non-affiliated pharmacies (ignoring legitimate business reasons for different rates), the expectation ... is that the affiliates will have higher reimbursements in 50% of cases. *** The auditor assumes an incorrect null hypothesis of 0% of cases.*

The auditor’s conclusion based solely on the observation that Express Scripts paid its affiliated pharmacies higher reimbursements in 24% of studied cases is incorrect. Under equal treatment of affiliated and non-affiliated pharmacies (ignoring legitimate business reasons for different rates), the expectation (*i.e.*, the null hypothesis) under equal sample sizes is that the affiliates will have higher reimbursements in 50% of cases. If you have two standard normal variables drawn from the same distribution (equal treatment), then one will exceed the other

50% of the time. The auditor assumes an incorrect null hypothesis of 0% of cases.

The auditor's greater-or-less-than approach permits a statistical test based on the Binomial distribution, assuming each comparison is an independent coin flip with some probability p the affiliate gets paid more and assuming no ties in pricing. As auditor neither provides nor considers additional information, these assumptions match the auditor's approach.

There are 2,318 reimbursement comparisons the expected value of incidences of higher reimbursements to the affiliate under equal treatment is 1,159 [= 2318·0.5]. The 95% confidence interval of observed outcomes falls between 1,112 and 1,206 incidences.¹⁴ That is, if Express Scripts paid its affiliate higher reimbursements between 1,112 and 1,206 cases, then there is no evidence of a pattern or practice of preferential treatment—such differences are just random noise. If Express Scripts paid its affiliate higher reimbursements in over 1,206 cases, then the evidence supports a pattern of preferential treatment, or if it paid its affiliate more in fewer than 1,112 cases, then the evidence supports a pattern of preferential treatment of unaffiliated pharmacies. Figure 1 illustrates the normal approximation of the outcomes.¹⁵



The observed number of 568 for higher reimbursements to the affiliate is well outside the confidence interval, so equal treatment may be rejected ($t = 24.5$, $\text{prob} < 0.1\%$). While we can reject the null hypothesis of equal treatment, with 568 cases being below the lower bound (1,112 cases), the auditor's findings, as they are presented, are invalid—in fact, they are precisely backwards. *The data indicate that Express Scripts was favoring unaffiliated pharmacies, not its affiliates.* Perhaps this should have been obvious, since Express Scripts paid its pharmacies less than unaffiliated pharmacies in 76% of cases.

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The auditor's error in choosing the incorrect null hypothesis is easily demonstrated by using a Monte Carlo Study ("MCS").¹⁶ To link this analysis to actual wholesale prices, data are obtained on the National Average Drug Acquisition Cost ("NADAC") for a large quantify of drugs (31,724) spanning several months.¹⁷ A price is created for two groups equal to the NADAC plus a group-specific random disturbance term drawn from a normal distribution with mean zero and a standard deviation of $0.12 \times \text{NADAC}$.¹⁸ A sample of 2,318 drugs are randomly selected in 1,000 simulations with equal treatment. The affiliated pharmacy receives a higher reimbursement in 50% of cases, and a lower reimbursement rate in 50% of cases (as expected). This simple experience confirms that the null hypothesis is that the affiliated pharmacy receives higher compensation in 50% of cases *under equal treatment*.

Now, say that there is favoritism toward the affiliate and that the affiliated pharmacy receives

an average reimbursement of 10% more than the unaffiliated pharmacy. In this scenario, the affiliated pharmacy receives a higher maximum reimbursement rate in about 72% of cases (> 50%). Or, say that the affiliated pharmacy receives an average reimbursement of 10% less than the non-affiliated pharmacy. In this scenario, the affiliated pharmacy receives a higher reimbursement rate in about 28% of cases (< 50%).

Looking at these results again confirms the error in the auditor's findings. With the affiliated pharmacies receiving reimbursements exceeding non-affiliated pharmacies in only 24% of cases suggest that the affiliated pharmacies were more often receiving lower reimbursement rates than were unaffiliated pharmacies. Finding a higher reimbursement rate in 24% of cases is strong evidence *against a pattern or practice of preferential treatment of affiliated pharmacies, not a preference for them.*

In sum, Tennessee's audit offers no evidence of a pattern or practice a favoritism towards affiliated pharmacies – the audit failed to employ a proper empirical approach and established an invalid standard for equal treatment (an invalid null hypothesis). Under the proper null hypothesis, the evidence, as it is, supports a pattern or practice of lower, not higher, reimbursement to the affiliated pharmacy.

Conclusion

A central claim in the policy debate over PBMs is that PBMs pay higher reimbursement rates to affiliated pharmacies than to unaffiliated pharmacies. The evidence supporting this claim is scant. A Tennessee audit of Express Scripts is sometimes cited as evidence of PBM favoritism to affiliated pharmacies, but as detailed here the findings of the auditor are incorrect. The auditor's analysis fails to meet basic standards for the statistical analysis of systematic discrimination. Even worse, the correct interpretation of the auditor's findings (affiliated pharmacies receiving higher reimbursements in only 24% of cases, and lower reimbursements in 76% of cases) suggest a "pattern or practice" of compensating affiliated pharmacies *less than* non-affiliated ones. The auditor's conclusion is precisely backward.

When it comes to adding regulations to the already heavily regulated healthcare sector, policymakers should ground decisions in sound empirical evidence, based on sound economic principles, rather than industry advocacy and improper analysis. Moving forward, policymakers should demand economic and empirical rigor when evaluating claims about market dysfunction. The pharmacy sector's challenges, familiar to all local retailing, deserve thoughtful policy responses, but those responses should be based on evidence rather than assertions.

NOTES:

* **Dr. George S. Ford** is the Chief Economist of the Phoenix Center for Advanced Legal and Economic Public Policy Studies. The views expressed in this Perspective do not represent the views of the Phoenix Center or its staff. Dr. Ford may be contacted at ford@phoenix-center.org.

¹ Data available at: <https://nashp.org/state-tracker/state-pharmacy-benefit-manager-legislation>.

² J.R. Guardado, *Competition in PBM Markets and Vertical Integration of Insurers with PBMs: 2024 Update*, American Medical Association (2025) (available at <https://www.ama-assn.org/system/files/prp-pbm-shares-hhi-2024.pdf>).

³ *PBM Power Play: Examining Competition Issues in the Prescription Drug Supply Chain*, U.S. Senate Committee on the Judiciary (May 13, 2025) (available at: <https://www.judiciary.senate.gov/committee-activity/hearings/pbm-power-play-examining-competition-issues-in-the-prescription-drug-supply-chain>); *Report on Audit of Express Scripts Administrators, LLC*, Department of Commerce and Insurance, State of Tennessee (December 31, 2023) available at (<https://www.tn.gov/content/dam/tn/commerce/documents/insurance/companyexam/ExpressScriptsAdminLLC%20EXAM04102025.pdf>).

⁴ Tennessee Code Annotated § 56-7-3118(d).

⁵ While this summary provides a flavor of the transaction, reality may be far more complicated. For instance, there can be rebates, discounts, coupons, and administrative payments and fees. For instance, compensation may be reduced by various fees that the pharmacy owes back to the PBM, such as DIR (Direct and Indirect Remuneration) fees, network participation fees, or performance-based adjustments that are reconciled after the point of sale.

⁶ Tennessee Code Annotated § 56-7-3118(d) (emphasis supplied). It is worth noting that this statute ignores the difference between transfer and market prices; contrasting the two is comparing apples-to-oranges. Prices paid between affiliates are not arms-length transactions and may reflect tax consequences, regulation, or other concerns

⁷ See, e.g., T.R. Beard, G.S. Ford and L.S. Spiwak, *Digital Discrimination Under Disparate Impact: A Legal And Economic Analysis*, 48 TELECOMMUNICATIONS POLICY 102853 (2024) (originally published as PHOENIX CENTER POLICY PAPER NO. 61: *Digital Discrimination Under Disparate Impact: A Legal and Economic Analysis*); J. Hersch and B.D. Bullock, *The Use and Misuse of Econometric Evidence in Employment Discrimination Cases*, 71 WASHINGTON AND LEE LAW REVIEW 2365-2429 (2014); *Teamsters v. United States*, 431 U.S. 324 (1977).

⁸ *Griggs v. Duke Power Co.*, 401 U.S. 424 (1971).

⁹ Tennessee Code Annotated § 56-7-3118(d).

¹⁰ *Notice of Change in Medicaid State Plan*, Tennessee Department of Finance and Administration (September 29, 2023) (available at: <https://www.tn.gov/content/dam/tn/tennicare/archive/PharmacyDispensingFeesSPAPublic%20Notice.pdf>).

¹¹ An “ambulatory pharmacy” is a pharmacy that serves outpatients.

¹² See, e.g., *Drug Pricing Part 2: Generic Drug Pricing*, IPD Analytics (December 15, 2021) (available at: <https://www.ipdanalytics.com/post/understanding-generic-drug-pricing>); R. Mahmoud, *Maximum Allowable Cost (MAC)*, RETAILDOGMA (last visited May 28, 2025) (available at: <https://www.retaildogma.com/maximum-allowable-cost>); *Our Maximum Allowable Cost (MAC) Pricing is a Commonly Used Tool to Manage Drug Costs*, CVSHealth (August 15, 2018) (available at: <https://www.cvshealth.com/news/prescription-savings/our-maximum-allowable-cost-mac-pricing-is-a-commonly-used-tool-t.html>); *Maximum Allowable Cost (MAC) Pricing*, AMCP (December 2013) (available at: <https://www.amcp.org/legislative-regulatory-position/maximum-allowable-cost-mac-pricing>).

¹³ *Drug Pricing Part 2*, *id.*

¹⁴ The standard deviation is $\sigma = (np(1 - p))^{0.5}$. These values may also be computed using Microsoft Excel’s BINOM.INV function.

¹⁵ The normal approximation is reasonable given the large sample.

¹⁶ A MCS uses repeated random sampling to solve problems that are difficult or impossible to solve analytically. MCS involves generating many random scenarios based on specified probability distributions and then running a model or calculation for each scenario.

NOTES CONTINUED:

¹⁷ Data (December 25, 2024) available at: <https://data.medicaid.gov/dataset/99315a95-37ac-4eee-946a-3c523b4c481e>.

¹⁸ The coefficient of variation for the intertemporal variation in NADAC for National Drug Codes is about 0.12 across a wide range of NADAC.