

GROUP PURCHASING ORGANIZATIONS:

**How GPOs Reduce Healthcare Costs and Why Changing
Their Funding Mechanism Would Raise Costs**

A Legal and Economic Analysis

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I. Executive summary¹

Group purchasing organizations (GPOs) are companies that negotiate prices for drugs, devices, and other medical products and services on behalf of healthcare providers, including hospitals, ambulatory care facilities, physician practices, nursing homes, and home health agencies. Often, GPOs are owned by their member providers.² They do not take title to or possession of medical products. Rather, the central purpose of GPOs is to enhance the quality of the services delivered and lower their members' operating costs by reducing transaction costs and negotiating lower prices for supplies than providers might otherwise obtain on their own. As part of improving efficiency in the supply chain, GPOs also provide a range of additional services to healthcare providers that may lower costs or improve operations.

This paper examines empirical evidence and applies economic analysis to assess whether GPOs operate competitively and reduce healthcare costs. The paper further examines a common GPO funding mechanism—administrative fees paid by vendors—which Congress has authorized to help GPOs cut healthcare costs. We reach the following conclusions:

1. **GPOs save money for healthcare providers, patients, and taxpayers.** GPOs negotiate contracts between medical supply and services vendors and healthcare providers, including hospitals. In that role, GPOs create value by lowering transaction costs (for example, eliminating thousands of negotiations) and negotiating lower prices. Customer surveys show that providers realize savings of 10% to 18% by using GPOs, measured relative to the costs providers would have incurred if they negotiated prices on their own. These savings are likely to be especially valuable to smaller, rural hospitals, which may benefit relatively more than larger hospitals from GPO services. Providers pass these savings on to patients and ultimately to taxpayers.
2. **GPOs promote competition in the market for procurement services.** Providers can choose from multiple GPOs, and they also can, and commonly do, use multiple GPOs simultaneously. Providers often own and control their GPOs, and they can also procure supplies directly from vendors. As a result, the supply procurement market is highly competitive.
3. **The current GPO funding model helps support competition and lower costs for providers, patients, and taxpayers.** Vendor funding is neutral compared to provider funding with respect to efficiency, except where collecting fees from vendors cuts transaction costs. In those cases, vendor funding is a more efficient means of funding GPOs. Vendor funding is common in comparable industries, and, for GPOs, collecting fees from vendors is likely more efficient than other mechanisms.

¹ This paper was funded by the Healthcare Supply Chain Association.

² For example, Vizient, the largest GPO in the United States, is member owned. Premier, the only publicly traded firm among the four largest GPOs in the United States, is owned in part by members, who control 74% of voting shares. See Premier, Inc., *2015 Annual Report* [hereinafter “Premier Annual Report”], 40, available at http://s2.q4cdn.com/774486855/files/doc_financials/2015/PINC-2015_6_30-10K_FINAL.pdf.

Accordingly, we find compelling evidence that GPOs have created value in the marketplace, and we find that vendor funding, which Congress authorized 30 years ago, has contributed to that value. Altering the current GPO funding mechanism would likely have adverse effects on providers, consumers, and taxpayers.

* * *

II. Introduction

II.A. The GPO Safe Harbor

The history of federal policy regarding GPO administrative fees shows that policy makers recognize that GPOs create substantial efficiencies and should be permitted to operate based on their traditional vendor-funding model. Both Congress and the Department of Health and Human Services (HHS) recognize the need for efficient pricing institutions to constrain healthcare costs. The statutory clarification for GPOs (GPO Statutory Clarification)³ enacted by Congress and the subsequent codification of this provision in the HHS safe harbor provisions (GPO Regulatory Safe Harbor) clarified the legality of administrative fees paid by vendors to GPOs.⁴

At the time the GPO Statutory Clarification was enacted, no court had ever found that vendor fees paid to a GPO constituted a “kickback” under the Anti-Kickback Statute (AKS). Nevertheless, the Justice Department and the HHS Office of Inspector General (OIG) declined to offer an advisory opinion on the subject of vendor fees. Congress therefore felt it was important to resolve any uncertainty about the GPO business model by clearly excluding vendor fees from the AKS.

In considering the GPO Statutory Clarification, the House Budget Committee explained that “GPOs could help reduce health care costs . . . and that a safe harbor should be established to ensure that GPOs and the vendors with which they contract do not risk prosecution as a result of the payment and collection of administrative fees.”⁵ Thus, Congress affirmed the legality of vendor-paid fees with the intent of allowing the GPO industry’s efficient, cost-reducing pricing institutions to arise. The economic analysis in this paper supports this reasoning and explains why altering the funding mechanism would be inefficient.

³ The GPO Statutory Clarification, 42 U.S.C. § 1320a-7b(b)(3)(C), has also been referred to as a “safe harbor” provision or as a statutory “exception.” *See, e.g.*, U.S. Government Accountability Office. “Group Purchasing Organizations: Funding Structure Has Potential Implications for Medicare Costs” (Report GAO-15-13, General Accountability Office, Washington, DC, 2014) [hereinafter “GAO (2014)”], 7 note 13. We do not adopt that terminology in this paper.

⁴ The AKS, passed in 1972 as an amendment to the Social Security Act, made it illegal to pay or receive money to induce the referral of business and orders for purchases reimbursable under Federal healthcare programs. *See* 42 U.S.C. § 1320a-7b(b)(1)–(2). In the years after the statute was passed, the legality of vendor fees and other GPO contracting practices came into question. Recognizing that expansive enforcement of the AKS could prevent efficient business transactions, Congress enacted clarifications and exceptions to the statute in 1986 (the GPO Statutory Clarification); *see* Omnibus Budget Reconciliation Act of 1986, Pub. L. No. 99-509, § 9321(a), 100 Stat. 1874, 2016 (Oct. 21, 1986) (codified at 42 U.S.C. § 1320a-7b(b)(3)(C)); H.R. Rep. No. 991012, at 309 (1986) (Conf. Rep.). In 1987, Congress instructed HHS to establish regulations creating safe harbors from the AKS; *see* Medicare and Medicaid Patient and Program Protection Act of 1987, Pub. L. No. 100-93, § 14, 101 Stat. 680, 697 (1987). This resulted in the modern GPO Regulatory Safe Harbor; *see* 42 C.F.R. § 1001.952(j).

⁵ *See* GAO (2014), p. 2.

II.B. GPOs reduce healthcare costs

Recent surveys of healthcare providers show that GPOs reduce healthcare costs.⁶ As described in Part IV, hospital executives state that GPOs reduce the cost of their healthcare supplies by 10%–18%. Economic theory indicates why GPOs are likely to reduce costs: providers voluntarily decide whether to join a GPO and, after joining, decide whether to purchase any particular item under the GPO contract or under a contract obtained directly from a supplier or another GPO. A healthcare provider would have no incentive to become a GPO member or choose to make purchases through a GPO if these strategies increased its costs or inefficiently reduced its supply choices. This incentive structure provides a strong basis to expect that GPOs reduce, rather than increase, providers’ costs. This conclusion is well supported in the economic literature, which identifies at least two mechanisms through which GPOs could reduce providers’ operating costs and thereby reduce healthcare costs: transaction cost savings and lower prices from larger discounts.

II.C. Competitiveness of the GPO market

Evidence indicates that GPOs operate in a highly competitive market. Many national, regional, and local GPOs compete with each other in the provision of GPO services. Many GPOs are owned by their provider members, which have strong incentives to direct GPOs to offer them competitive services. Providers can choose to buy through a competing GPO with whom they have contractual arrangements, or they can choose to negotiate directly with vendors. As described in Part V, these factors combine to make the market for GPO services significantly more competitive than it would be without customer ownership and opportunities for self-supply. Our estimate is that the GPO market operates with a level of competition equivalent to what one would expect from an unconcentrated market with more than 10 independent competitors of equal size.

II.D. Effects of vendor funding of GPOs

Most GPOs are funded by vendor-paid⁷ administrative fees that are a percentage of the sales made pursuant to GPO contracts. This paper analyzes how this funding mechanism affects healthcare supply procurement costs. While a few critics have suggested that vendor fees contribute to higher healthcare costs and have therefore suggested that such fees should be prohibited, our analysis suggests otherwise. In Part VI, we analyze how the source of funding—whether fees are collected from suppliers or providers—

⁶ We use several terms throughout the paper that we define as follows. “Supplies” or “healthcare supplies” refer to non-labor products and services used by healthcare providers in the supply of healthcare services. These include medical products, devices, pharmaceuticals, information technology products, and food products and services. “Transaction costs” refer to the administrative costs in the supply chain associated with sale and purchase of healthcare supplies. “Procurement costs” include both transaction costs and the prices paid for supplies. “Costs” or “operating costs” refer to all expenses associated with operating the relevant business.

⁷ Throughout this report we use the terms “vendor,” “supplier,” and “manufacturer” interchangeably.

affects healthcare costs. We find that there is no basis for altering the GPO funding mechanism, and that doing so would likely raise healthcare costs for American consumers and taxpayers.

II.D.1. The neutrality principle

Well-established economic principles indicate that the source of GPO funding is likely to be irrelevant apart from its effects on transaction costs. As described in Part VI, this reasoning borrows from the economic literature on taxation, which establishes that the burden of a tax, such as an excise tax based on a percentage of the purchase price, generally does not depend on whether the tax is levied on buyers or sellers. We refer to this fundamental economic proposition as the “neutrality principle.” Applied to the GPO funding question, GPOs use market mechanisms to drive prices down through negotiations between buyers and sellers; their ability to reduce prices in these negotiations is unrelated to whether their fees are nominally paid by the buyer or by the seller.⁸

II.D.2. Transaction costs

With respect to transaction costs, the economic literature predicts that if a GPO in a competitive market adopts a funding mechanism that does not minimize these costs, the GPO is likely to be displaced by competitors that do, or by providers’ self-procurement. As a result, we would expect GPOs to evolve funding mechanisms that minimize transaction costs. This prediction is particularly strong in light of the highly competitive market in which GPOs operate and in the absence of evidence of collusion, coordination, or other anticompetitive activity. As a result, the natural inference from the prevalence of vendor funding among GPOs is that this funding mechanism is more efficient than the alternative of collecting these fees from providers. It follows from this inference that (1) vendor-paid fees allow GPOs to provide a greater reduction in healthcare costs than would be possible by shifting fees to providers and (2) prohibiting vendor fees would likely raise healthcare costs.

II.D.3. Addressing concerns about vendor funding

The remainder of this section addresses the specific claims that are typically expressed by critics of vendor fees. Ultimately, none of these claims is persuasive, and they do not alter our analysis that vendor fees likely cut healthcare costs and should therefore not be prohibited as a funding mechanism for GPOs. The concerns expressed over vendor-paid fees fall into three classes: (1) *incentive distortions*—the claim that the current vendor fee structure discourages GPOs from negotiating lower prices;⁹ (2) *exclusion*—the

⁸ The neutrality result holds under a wide range of GPOs’ objectives. In Part VI we explain that the same logic applies whether GPOs pursue the interests of providers, as commonly assumed in the GPO literature (and consistent with the ownership structure of many GPOs), or whether they represent sellers or pursue their own profit objectives as independent companies. The result also holds under a range of GPO market structures.

⁹ See, e.g., Robert E. Litan, Hal J. Singer, and Anna Birkenbach, “An Empirical Analysis of Aftermarket Transaction by Hospitals,” *Journal of Contemporary Health Law and Policy* 26, no. 1 (2011): 25 [hereinafter “Litan et al. (2011)”], and GAO (2014), 19.

claim that vendor fees exclude rival suppliers and raise prices;¹⁰ and (3) *fraud*—the claim that providers may fail to report “sharebacks” of administrative fees received from GPOs, potentially leading to excessive Medicare reimbursement.¹¹ These three concerns are discussed in turn below.

Incentive Distortions. The incentive distortion claim discussed in the literature appears to be as follows: because administrative fees are proportional to vendors’ sales, a GPO might increase its fee revenue by negotiating higher prices for drugs, devices, and other products and services, rather than the lowest possible prices on behalf of its member providers.¹² However, as discussed in Section V, GPOs face constraints from their members, who often own their GPOs, as well as strong competitive constraints—both from other GPOs and from providers’ ability to self-procure supplies—that prevent them from raising their members’ costs.

Even holding aside the intensely competitive nature of the GPO market, the incentive distortion argument is actually unrelated to the question of whether GPOs collect fees from vendors. According to the argument, an incentive distortion would arise whether fees that are proportional to sales were paid to GPOs by vendors or providers. If payments from vendors were barred, GPOs would likely require providers to pay their fees based on a percentage of sales, because sales-based fees have many advantages over other types of fees. Yet if the incentive distortion claim is accepted, the same distortion would exist. In any event, we do not believe the incentive distortion is persuasive, regardless of whether fees are paid by vendors or providers. Since vendor fees are more efficient to collect, the most likely effect of shifting administrative fees from vendors to providers would be an increase in the transaction costs of supply procurement and, ultimately, higher healthcare costs.

Notably, vendor-paid fees based on sales are common in many industries. Examples include online retailers such as Amazon, online auctions such as eBay, and credit card services. We are not aware of any economic studies indicating that vendor-paid fees create unwanted incentives in these industries.

Exclusion. Exclusion concerns surrounding vendor-paid fees boil down to two arguments that such fees enhance the scope for anticompetitive exclusion. One argument is that small manufacturers cannot afford to pay administrative fees, so the fees effectively deny them access to a critical mass of providers to buy their products. A second argument is that vendor-paid fees increase the likelihood of anticompetitive exclusive dealing arrangements. These arguments are not persuasive.

¹⁰ See David Balto, “The Effects of Regulatory Neglect on Health Care Consumers” (testimony before the Consumer Protection, Product Safety and Insurance Subcommittee of the Senate Committee on Commerce, Science and Transportation, July 16, 2009); and Einer Elhauge, “The Exclusion of Competition for Hospital Sales Through Group Purchasing Organizations” (white paper, Harvard Law School, Cambridge, MA, 2002).

¹¹ See GAO (2014), p. 23.

¹² Litan et al. (2011) state: “If a GPO is receiving an administrative fee equal to a percentage of the proceeds, the GPO’s incentive to seek out the lowest prices for hospitals is weakened,” Litan et al. (2011), 25. GAO (2014) echoed this concern: “[T]he GPO funding structure protected under the safe harbor—specifically, the payment of administrative fees by vendors based on a percentage of the cost of the product or services—raises questions about whether GPOs are actually negotiating the lowest prices,” GAO (2014), 22–23.

At the outset, it is important to note the nature of the GPO market, which provides many opportunities for competition between vendors. While GPOs sometimes negotiate sole-source contracts with vendors when doing so is advantageous to their customers,¹³ GPOs more often provide a schedule of contract opportunities that include multiple vendors for a particular type of product. In addition, providers often purchase through multiple GPOs and make other purchases without the services of a GPO.

Moreover, economic principles do not support the claim that vendor-paid fees enhance the scope of anticompetitive exclusion.

First, the claim regarding affordability ignores the implications of the neutrality principle, which yields a strong presumption that the source of GPO funding will not affect vendors' profits. In particular, the share of the "burden" of administrative fees borne by vendors does not depend on whether the fees are paid by vendors or providers, just as the "burden" of a tax does not depend on whether it is paid by sellers or buyers. The most likely effect of shifting administrative fees from vendors to providers would be an increase in transaction costs, and vendors would bear a portion of the increase. This would make small vendors *less* likely to participate in sales through GPOs, the opposite of the intended effect.

Second, the exclusive dealing concern appears to be based on the idea that buyers require compensation to convince them to agree to exclusive contracts, and vendor fees might constitute such compensation. However, vendor-paid administrative fees are typically proportional to sales, whereas the payments from suppliers to buyers in anticompetitive theories of exclusive dealing are *up-front fixed* payments that do not vary with sales. The economic literature does not support the idea that supplier-paid fees proportional to sales are conducive to an anticompetitive exclusive dealing arrangement.¹⁴

Additionally, as discussed further in Part V, the economic literature explains how individual firms or groups of firms can sometimes intensify supplier competition by committing to purchase from a limited set of suppliers. Exclusion in this context is an effort to induce greater competition among suppliers to obtain lower prices. Consistent with this insight, GPOs sometimes negotiate dual-source and sole-source contracts with vendors "when it is advantageous to their customers."¹⁵ As a result of the neutrality principle, the benefits of this strategy exist independently of whether administrative fees are levied on vendors or providers.

¹³ GAO (2014), 13.

¹⁴ Theories in which suppliers make up-front fixed payments to buyers to convince them to agree to exclusive dealing arrangements include the "divide and conquer theories" (Eric Rasmusen, Mark Ramseyer, and John Wiley Jr. "Naked Exclusion," *The American Economic Review* 81, no. 5 (1991): 1137–1145, and Ilya Segal and Michael Whinston, "Naked Exclusion: Comment," *The American Economic Review*, 90 no. 1 (2000): 296–309) and the "softening competition" theories (John Simpson and Abraham Wickelgren, "Naked Exclusion, Efficient Breach, and Downstream Competition," *The American Economic Review* 97, no. 4 (2007): 1305–20, and Jose Miguel Abito and Julian Wright, "Exclusive Dealing with Imperfect Downstream Competition," *International Journal of Industrial Organization* 26, no. 1 (2008): 227–46). If the payments from the supplier to buyers were proportional to sales in these models, the supplier would likely adjust the price of the product to offset the exclusivity payments. In this case, buyers would no longer have incentives to agree to the contracts, and the theories would break down.

¹⁵ GAO (2014), 13.

The circumstances in which potential harm from exclusion outweighs potential pro-competitive effects in any industry are complex and must be examined on a case-by-case basis. This task is best addressed through the antitrust process, not by altering fee structures in ways that are likely to raise healthcare costs.

Fraud Concerns. Finally, the concern that sharebacks will not be reported and therefore costs will be overstated is a common one in industries that involve government reimbursement or cost-based price regulation. For example, direct sales to hospitals—sales that are not based on a GPO contract—raise the same concern because sellers often offer rebates or discounts to buyers that the buyer may fail to report. In addition, if GPO fees were paid by providers, GPOs could still provide sharebacks to the providers and manufacturers could provide rebates as well. Consequently, there is nothing unique about GPOs or the vendor-funding model that increases the risk of fraud over other types of purchases by providers. As the General Accountability Office (GAO) recognized, the appropriate way to address alleged fraud is by enforcing current law, which requires healthcare providers to report sharebacks along with their costs in Medicare cost reports.¹⁶

II.D.4. Summary

The available evidence supports the conclusion that GPOs and their vendor fee mechanisms produce savings; it does not support the inference that the vendor fee mechanism causes GPOs to fail to negotiate lower prices, causes lower-cost vendors to be excluded from GPO contracts, or results in a heightened risk of fraud. In addition, economic analysis yields a strong inference that the vendor fee model likely reduces transaction costs compared to other funding models. As a result, there is no empirical or economic basis for altering the current GPO funding mechanism. Such a change would likely raise administrative costs, thereby increasing healthcare costs for American consumers.

The remainder of this paper is organized as follows: Section III lays out the recent history of GPO funding and federal law and policy. Section IV presents evidence that GPOs reduce healthcare costs and explains how GPOs can generate transaction cost savings and better pricing. Section V provides evidence that GPOs operate in a highly competitive market that is not conducive to anticompetitive effects associated with the incentive distortion and exclusion concerns. Section VI explains why the source of GPO funding is likely irrelevant apart from transaction cost effects. Section VII concludes.

¹⁶ Consistent with this approach, the GAO observed that “hospitals’ potential underreporting of administrative fee revenue presents an immediate risk that can be addressed *within the current GPO funding structure*” GAO (2014), 23 (emphasis added). The GAO recommended that “the Secretary of the Department of Health and Human Services determine whether hospitals are appropriately reporting their administrative fee revenues on their Medicare cost reports and take steps to address any under reporting that may be found,” *Id.*, 23–24.

III. Federal policy toward GPO funding

Congress has taken deliberate action to support the modern GPO funding model in order to encourage the operation of cost-saving GPOs. Congress took this step through an amendment to the AKS, a law initially enacted in 1972 to combat fraud and abuse in federal healthcare programs. The AKS imposes criminal penalties for knowingly and willfully offering, paying, soliciting, or receiving remuneration in return for (1) a referral for goods or services reimbursable under federal or state healthcare programs or (2) ordering or recommending any such good or service.¹⁷

In 1977, the AKS was amended to cover a broader range of transactions.¹⁸ By the 1980s, however, growing concern over the uncertain breadth of the statute led Congress to create several statutory exceptions to the AKS and to direct the HHS OIG to create several regulatory safe harbors. In 1986, Congress enacted a number of exceptions to the AKS's criminal prohibitions. Among these provisions was the GPO Statutory Clarification, which clarified that fees that vendors paid to a GPO were not prohibited by the AKS as long as proper disclosures are made.¹⁹ The House Budget Committee considered the bill, explaining that it saw “no justification for prohibiting such cost-saving arrangements” and that “GPO’s can help reduce health care costs for the government and the private sector alike.”²⁰

In 1987, Congress followed up by directing HHS to issue regulations further defining business arrangements that would not be considered kickbacks under the AKS.²¹ In its report on the legislation, the Senate Judiciary Committee noted that these regulations were necessary because the breadth of the AKS “created uncertainty among health care providers as to which commercial arrangements are legitimate, and which are proscribed.”²²

HHS OIG issued the first in a series of regulations establishing safe harbors in 1991.²³ Regarding GPOs, the regulations describe a safe harbor for “any payment by a vendor of goods or services to a group purchasing organization (GPO), as part of an agreement to furnish such goods or services to an individual or entity,” provided that adequate fee disclosures are made.²⁴ To qualify for the safe harbor, a GPO must:

¹⁷ 42 U.S.C. § 1320a-7b.

¹⁸ See Pub. L. No. 95-142, 91 Stat. 1175 (1977).

¹⁹ Omnibus Budget Reconciliation Act of 1986, Pub. L. No. 99-509, § 9321(a), 100 Stat. 1874, 2016 (codified at 42 U.S.C. § 1320a-7b(b)(3)(C)) (exempting from the AKS's criminal prohibitions “[A]ny amount paid by a vendor of goods or services to a person authorized to act as a purchasing agent for a group of individuals or entities who are furnishing services reimbursed under a Federal health care program if— (i) the person has a written contract, with each such individual or entity, which specifies the amount to be paid the person, which amount may be a fixed amount or a fixed percentage of the value of the purchases made by each such individual or entity under the contract, and (ii) in the case of an entity that is a provider of services . . . , the person discloses (in such form and manner as the Secretary requires) to the entity and, upon request, to the Secretary the amount received from each such vendor with respect to purchases made by or on behalf of the entity.”)

²⁰ H.R. Rep. 99-727, 72-73 (1986).

²¹ Pub. L. No. 100-93 § 14, 101 Stat. 680 (1987).

²² S. Rep. No. 100-109, 27 (1987).

²³ 42 C.F.R. § 1001.952.

²⁴ 42 C.F.R. § 1001.952(j).

1. Have a written agreement with its customers stating that the administrative fees paid by vendors to the GPO are three percent or less of the purchase price of the relevant goods or, if the fee exceeds three percent, the agreement must specify the maximum fee that each vendor will pay the GPO; and
2. Disclose in writing to each customer, at least annually, and to the Secretary of HHS upon request, the amount of administrative fees received from each vendor with respect to purchases made by or on behalf of the customer.²⁵

In 2002 and 2003, the Senate Judiciary Committee held hearings regarding complaints from small medical device manufacturers, which argued they were being unfairly excluded from GPO contracts.²⁶ Following those hearings, GPOs agreed to create the GPO Code of Conduct (GPO Code), a detailed set of principles designed to make the market for the procurement of healthcare supplies more transparent and competitive. The GPO Code calls for each signatory to develop its own code of conduct and conflict-of-interest policy, to train employees on ethical business practices, and to take steps to assure “high quality healthcare and cost effectiveness” as well an “open and competitive purchasing process.”²⁷ The GPO Code further seeks to foster public accountability by requiring signatories, including all the major national GPOs, to certify compliance with the Code each year.

In the 30 years since Congress enacted the GPO Statutory Clarification and acknowledged that GPOs “can help reduce health care costs,” federal policymakers have continued to support the GPO safe harbor and have taken no steps to prohibit vendor funding. As discussed below, empirical evidence and economic theory both suggest that Congress and HHS are wise to continue to allow GPOs’ current funding model, which helps GPOs improve healthcare quality and generate substantial healthcare savings for providers and consumers.

²⁵ *Id.*

²⁶ U.S. Senate, Comm. on the Judiciary, Subcomm. on Antitrust, “Hospital Group Purchasing: Lowering Costs at the Expense of Patient Health and Medical Innovations?” Hearing, Apr. 30, 2002 (S. Hrg. 107-899); U.S. Senate, Comm. On the Judiciary, Subcomm. on Antitrust, “Hospital Group Purchasing: Has the Market Become More Open to Competition?” Hearing, July 16, 2003 (S. Hrg. 108-329).

²⁷ Healthcare Group Purchasing Industry Initiative, HGPII Code of Conduct Principles, 2016, *available at* <http://www.healthcaregpii.com/abouthgpii/codeofconduct.html>

IV. GPOs reduce healthcare costs

Survey data indicates that GPOs reduce healthcare costs. This data is consistent with standard economic reasoning, which explains why GPOs are likely to reduce healthcare costs. Healthcare providers are not required to make their purchases through GPOs, and in fact, many purchases are made directly from suppliers.²⁸ If joining and purchasing through a GPO raised a provider's cost, the provider would have no incentive to join. Logically, therefore, GPOs must lower providers' costs (or provide other benefits) relative to direct purchases.²⁹ This simple point does not depend on the structure of the market in which GPOs operate.

In the subsections below, we first review empirical evidence that GPOs reduce healthcare costs. We then explain how these savings arise: through transaction cost savings and enhanced volume and purchasing power that reduces prices. We finish the section by explaining how the transaction cost savings from an efficient funding mechanism are transmitted to healthcare providers through lower fees, lower costs of operation, and lower prices for healthcare supplies.

IV.A. Evidence of healthcare cost reductions

Surveys of healthcare providers indicate that GPOs reduce providers' supply costs substantially. The savings arise from lower prices for supplies and services and lower transaction costs through the reduction in time and effort spent in contract development, negotiation, and management.

The most recent study is by Burns and Yovovich (2014), who surveyed hospital executives responsible for supply chain management in their organizations.³⁰ They asked executives to evaluate their GPOs

²⁸ The Healthcare Supply Chain Association reports that 72% of nonlabor hospital supply purchases are made using GPOs, implying that more than 25% of supply purchases are directly from vendors. See "A Primer on Group Purchasing Organizations: Questions and Answers," accessed Sept. 6, 2016, [available at www.supplychainassociation.org/resource/resmgr/research/gpo_primer.pdf](http://www.supplychainassociation.org/resource/resmgr/research/gpo_primer.pdf).

²⁹ There are three theoretical caveats to this argument, none of which counters the point that GPOs are likely to reduce healthcare costs. First, if a GPO could facilitate coordination among providers in the healthcare services *output* market, then providers that compete in that market might join, even if doing so raised their costs. However, GPOs play no role in setting the prices for providers' services. Second, it is theoretically possible for an imperfectly competitive firm to benefit from an increase in the marginal cost of *all* competitors in the market (Michael L. Katz and Harvey S. Rosen, "Tax Analysis in an Oligopoly Model" (working paper no. 1088, NBER, Cambridge, MA, 1983); Sheldon Kimmel, "Effects of Cost Changes on Oligopolists' Profits," *Journal of Industrial Economics* 40, no. 4 (1992): 441–49.; E. Glen Weyl and Michal Fabinger, "Pass-Through as an Economic Tool: Principles of Incidence under Imperfect Competitions," *Journal of Political Economy* 121, no. 3 (2013): 528–83 [hereinafter "Weyl and Fabinger (2013)"]. In addition to being a rather special case, this mechanism would require a commitment by providers that join GPOs to purchase through them even if they find lower prices outside their GPOs. However, we understand that providers do not make such commitments for the great majority of their purchases, and evidence indicates that they frequently purchase outside of their GPOs when they find better deals. Third, competing providers could benefit from paying above competitive prices for supplies negotiated by a GPO if they could jointly commit not to purchase outside the GPO and recapture vendors' supracompetitive profits with lump sum payments. This argument fails for the same reason—providers frequently purchase outside their GPOs. Without committing to not do this, providers would have incentives to undercut this arrangement by purchasing on their own. In addition, GPOs typically have many members spread over large areas (often the entire country) that do not compete with each other and could not benefit from a strategy designed to weaken provider competition.

³⁰ Lawton Robert Burns and Rada Yovovich, "Hospital Supply Chain Executives' Perspectives on Group Purchasing: Results

according to a series of performance and utilization metrics. The responses offer a perspective on what hospital executives in the industry believe their GPOs do for them.

One set of questions asked the executives whether their GPOs allowed them to achieve cost savings in various ways. More than 80% of the respondents either strongly agreed or agreed that their GPOs generate

- “Savings from lower prices (88%)”
- “Demonstrable cost savings and improvements (86%)”
- “Savings from contract standardization (84%).”³¹

Another set of questions asked the executives whether they were satisfied with various aspects of their GPOs. Eighty-four percent of respondents reported being very satisfied or satisfied that their GPOs achieve “group purchasing and other discounts.”³²

Burns and Yovovich (2014) conclude that the respondent hospitals in their survey derive benefits from GPOs in the form of both lower prices and cost savings. Their findings largely confirm the results of an earlier survey conducted by Burns and Lee (2008), which concluded that GPOs reduce healthcare costs by lowering product prices and transaction costs.³³

Schneller (2009) surveyed 429 hospitals in 28 hospital systems for information on the savings they achieved via lower supply prices and reduced labor requirements by purchasing through a GPO rather than directly from suppliers. His survey estimates that GPOs lowered hospitals’ supply costs by 18.7%.³⁴

Other surveys report that GPOs reduce hospital costs by 10%–15%.³⁵ The survey evidence is consistent with the logic that providers would not purchase through GPOs if doing so raised their costs.

Some studies show that GPO members sometimes pay lower prices by purchasing from outside their GPOs.³⁶ This evidence indicates that a GPO that sought to opportunistically raise supply prices (to

from a 2014 National Survey” (working paper, Wharton, University of Pennsylvania, Philadelphia, 2014), *available at* https://c.ymcdn.com/sites/www.supplychainassociation.org/resource/resmgr/Research/AHA_AHRMM_Wharton_2014_Survey.pdf [hereinafter “Burns and Yovovich (2014)”]. The authors report that 1,210 executives responded to their survey, a participation rate of 16%. *See* Burns and Yovovich (2014), 2.

³¹ Burns and Yovovich (2014), 7.

³² *Id.* at 8.

³³ Lawton R. Burns and J. Andrew Lee, “Hospital Purchasing Alliances: Utilization, Services, and Performance,” *Health Care Management Review* 33, no. 3 (2008): 203.

³⁴ Eugene S. Schneller, “The Value of Group Purchasing—2009: Meeting the Need for Strategic Savings,” Health Care Sector Advances, Inc., 2009, 6, *available at* https://www.novationco.com/media/industryinfo/value_of_gpo_2009.pdf.

³⁵ *See* David E. Goldenberg and Roland King, “A 2008 Update of Cost Savings and a Marketplace Analysis of the Health Care Group Purchasing Industry,” Locus Systems, Inc., July 2009, 6, *available at* https://c.ymcdn.com/sites/www.supplychainassociation.org/resource/resmgr/research/goldenberg_king.pdf.

³⁶ *See* U.S. General Accounting Office, “Group Purchasing Organizations: Pilot Study Suggests Large Buying Groups Do Not Always Offer Hospitals Lower Prices,” Testimony before the Subcommittee on Antitrust, Competition, and Business and Consumer Rights, Committee on the Judiciary, U.S. Senate, GAO-02-690T, 2002 [hereinafter “GAO (2002)”], and Litan et

increase the fees it collects) would be constrained by providers' abilities to purchase outside the GPO. The authors of one of these studies note that *if* the price differences they found were attributable to the GPO funding mechanism, then their findings "could lend support for reforming the way in which GPOs are financed."³⁷ Yet neither this study, Litan et al. (2011), nor any other presents any data or economic theory that would suggest such a price difference is attributable to the GPO funding model. On the contrary, there are several reasons to think that the price variation observed in these studies is unrelated to GPOs' funding mechanism.

The price variation observed in these studies—lower prices for certain purchases made outside the GPO—is precisely the variation we expect when some prices are established through longer-term contracts and others are determined through spot purchases. Both the prices available outside of GPOs and the opportunity costs to GPO members of taking advantage of them are subject to normal, random variation. Irrespective of the funding mechanism, we expect some GPO members to seek and sometimes find better deals outside their GPOs. That is, providers are likely to purchase outside their GPOs precisely when a lower price is available from that channel. Indeed, this behavior provides compelling evidence that GPOs are constrained by self-procurement, not that GPOs increase providers' costs. In any case, it says nothing about the efficiency of vendor-paid fees.

Moreover, the products purchased outside the GPO in the Litan et al. (2011) study came from vendors that were not on the GPO contract. Because one of the roles of GPOs is to help select high-quality products, we might expect that higher-priced products sold through the GPO would have higher quality. Litan et al. did not evaluate differences in product quality.

In summary, the evidence indicates that GPOs reduce healthcare providers' costs. There are two main mechanisms for this cost reduction: lower transaction costs and lower prices through joint purchasing.

IV.B. Transaction cost savings

One of the key roles of GPOs is to reduce transaction costs in the healthcare supply chain. This section explains how GPOs reduce transaction costs and how these savings are passed on to healthcare providers through the request for proposal (RFP) process and bargaining strategies that GPOs use to determine prices.

IV.B.1. Sources of transaction cost savings

The healthcare supply acquisition process is complex, involving thousands of suppliers selling many more thousands of pharmaceuticals, devices, products, and services to thousands of healthcare

al. (2011).

³⁷ Litan et al. (2011), 37.

providers.³⁸ Because prices are frequently negotiated and negotiations can be complicated, the scope for transaction cost savings from reducing the number of negotiations is large.

For perspective, imagine that 1,000 vendors each sell 10 products to each of 2,000 hospitals. If each vendor bargains separately with each hospital, there are 2 million negotiations to determine as many as 20 million prices.³⁹ GPOs reduce both the number of negotiations and the number of prices dramatically. If the GPO negotiates one price for each product on behalf of its members, then the number of negotiations falls from 2 million to 1,000, and the number of prices negotiated falls from 20 million to 10,000.⁴⁰ Even if the GPO negotiates a contract with each member in addition to its contracts with suppliers, the number of negotiations falls dramatically, from 2 million to 3,000: 1,000 negotiations between the GPO and suppliers and 2,000 negotiations between the GPO and hospitals.

GPOs provide a range of services for each contract they negotiate, including contract development, negotiation, and management. The ability to bypass vendor-by-vendor contract development, negotiation, and management lowers providers' transactions costs and saves resources. A survey by Schneller (2009) found that individual hospitals would require a 115% increase in labor (over nine full-time equivalents) to replace the functions performed by their GPOs. Because GPOs perform these functions for hundreds or thousands of providers simultaneously, the labor savings rise with the number of providers in the GPO.

IV.B.2. How transaction cost savings reduce healthcare costs

Transaction cost reductions that GPOs generate for providers reduce healthcare costs directly. Transaction cost savings that GPOs create for vendors are typically passed on to providers through reductions in the prices of supplies. This subsection explains how the GPO procurement process generates these savings.

GPOs use a "Request for Proposal" (RFP) process in combination with bargaining to determine prices for healthcare supplies. An RFP issued to several vendors creates a type of auction in which the companies bid for the right to supply one or more products. Price is not the only factor when GPOs evaluate RFP bids. GPOs examine the entire value proposition offered by a vendor in determining contract awards, including both price and nonprice dimensions. Nonprice dimensions include product quality, clinical

³⁸ Premier alone—just one of five national GPOs—has approximately 2,000 contracts with approximately 1,100 suppliers covering a wide range of products and services, including medical and surgical products, pharmaceuticals, laboratory supplies, capital equipment, information technology, facilities and construction, food, and other services (Premier Annual Report, 9). There are more than 5,000 hospitals in the United States (American Hospital Association, "Fast Facts on U.S. Hospitals," accessed Sept. 6, 2016, <http://www.aha.org/research/rc/stat-studies/fast-facts.shtml>), and 96%–98% of them use GPOs (Healthcare Supply Chain Association, "A Primer on Group Purchasing Organizations: Questions and Answers," accessed Sept. 6, 2016, http://c.ymcdn.com/sites/www.supplychainassociation.org/resource/resmgr/research/gpo_primer.pdf). . In addition, thousands of other providers use GPOs.

³⁹ If 1,000 vendors negotiate with 2,000 hospitals, the number of negotiations is 2,000,000 [1,000 x 2,000]. If each negotiation involves 10 prices, the number of prices negotiated is 20,000,000 [1,000 x 2,000 x 10].

⁴⁰ The GPO reduces the number of buy-side negotiations from 2,000 to 1. This reduces both the number of negotiations and the number of prices negotiated by a factor of 2,000, so the number of negotiations falls to 1,000 [2,000,000/2,000] and the number of prices negotiated falls to 10,000 [20,000,000/2,000].

efficacy, service, supplier reputation, and supplier capacity. The GPO typically narrows the set of suppliers based on the proposals, and then negotiates terms further with individual vendors.

Supplier cost savings are likely to benefit providers in the form of lower prices. As an example, suppose the GPO issues an RFP for a certain medical product to several competing vendors that, for illustrative purposes, are symmetrically situated and have good information about each other's costs. Holding nonprice issues aside for the moment, competitive bidding by the vendors will drive the prices vendors propose down to their unit costs.⁴¹ Thus, if the GPO reduces the vendor's transaction costs, then the RFP process will reduce the vendor's prices by the amount of the cost savings. In cases where vendors are asymmetric (for example, have different qualities) and have less than complete information about their rivals, the RFP process typically passes some fraction of the cost savings on to providers in the form of lower prices.

In most cases, GPOs engage in negotiations with individual suppliers chosen through the RFP. Negotiations also pass some of the transaction cost savings on to providers in the form of lower prices. In particular, an established principle of bilateral bargaining is that the negotiated price will divide the gains from trade according to the negotiators' relative bargaining strengths. A reduction in transaction costs increases the total pie (the total gains from trade) by the amount of the cost reduction. As long as each side has some bargaining strength, both sides will benefit from the cost reduction. For example, if the companies have equal bargaining strength, the negotiated product prices will fall by half the amount of the vendor's cost savings.

In other words, whether prices are determined through an RFP process, bargaining, or some combination, transaction cost savings experienced by vendors and providers are likely to reduce providers' operating costs and therefore reduce overall healthcare costs as well.

Impact of vendor funding on transaction costs. Because the GPO industry is highly competitive, as discussed in Part V, the pricing mechanism that evolved in this industry (vendor-paid fees) is likely to be one that minimizes transaction costs and generates savings. In a market economy, market forces tend to cause pricing institutions to evolve so as to minimize transaction costs.⁴² In particular, market forces such as entry and exit and the desire to earn profit tend to cause less efficient and therefore less profitable pricing institutions to be replaced by more efficient alternatives. Aspects of pricing institutions that may affect transaction costs include the pricing mechanism (for example, auctions, negotiations, purchases at list price), whether transactions occur through companies that have an intermediary role such as GPOs, and the way such companies are funded. If a GPO adopts a funding mechanism that does not minimize costs, it is likely to be displaced by other GPOs that do minimize costs, or by providers' own self-

⁴¹ If any vendor bid higher, it would be undercut by another. This is an example of a first-price auction with identical vendors that have complete information about their rivals' costs. Under these circumstances, the auction yields prices equal to the suppliers' costs.

⁴² The seminal article on transaction costs and the structure of markets and firms is Oliver Williamson, "Transaction-Cost Economics: The Governance of Contractual Relations," *The Journal of Law & Economics* 22, no. 2 (1979): 233–61.

procurement strategies. For example, if provider-based fees were a more efficient funding mechanism than vendor-paid fees, companies would have incentives to use them. Yet they more often do not. For this reason, it is likely that the current GPO funding mechanism minimizes transaction costs. These cost savings will likely be passed on to healthcare providers.

Indeed, the Healthcare Supply Chain Association estimates that a national GPO may serve approximately 3,000 hospitals and 100,000 nonacute providers and contract with roughly 2,500 vendors. Collecting fees from 2,500 vendors is likely more efficient than doing so from 103,000 providers. The alternative funding model based on provider fees would likely increase the costs of collecting fees.

IV.C. Lower prices through joint negotiations

In addition to savings realized from lower transaction costs, economic literature identifies several ways that joint purchasing can yield lower prices than buyers can obtain on their own. This subsection provides an overview of this literature. The savings discussed here arise independently of and in addition to transaction cost savings. However, if GPOs were required to use an inefficient funding mechanism, then both suppliers and buyers could be less inclined to transact business through GPOs and thus would be less likely to receive these benefits. In addition, a less efficient funding mechanism would reduce the benefits described here, even for firms that use GPO services.

IV.C.1. Stronger bargaining positions

A healthcare provider's bargaining strength depends in part on the size of the loss it can impose on a vendor by refusing agreement. If a vendor has little to lose from failing to reach an agreement with the provider, then the provider's bargaining position is weak, while if the vendor has a lot to lose, then the provider's position is strong. The bargaining principle presented earlier—that bargainers in similar bargaining positions negotiate prices that equalize their net benefits from trading—captures this idea.

As an example, suppose that a product is worth \$10 to a provider, and that the time spent negotiating the sale costs the vendor \$8. In this case, if the vendor and provider have equal bargaining strength, the bargaining principle implies that the negotiated price will be \$9, giving both parties a net benefit of \$1. Now suppose that the vendor's cost of the time spent negotiating the sale falls to \$2. In this case, the price that equalizes net benefits is \$6, giving both parties a net benefit of \$4.⁴³ The provider receives a lower price in the second case because the vendor has more to lose from failing to reach agreement, and the provider uses this fact to negotiate a better price.

The economic literature on joint bargaining uses this general idea to explain how buyers can bargain for lower prices by negotiating as a single unit (for example, a GPO) rather than separately. When an

⁴³ With a price of \$6, the vendor realizes a benefit of \$4 relative to the next best alternative of earning \$2. The provider realizes a benefit of \$4 because it values the product at \$10 but pays only \$6.

individual provider negotiates with a supplier, the provider's bargaining strength depends on the *incremental* benefit to the supplier of serving the provider one-on-one. When multiple providers form a GPO and negotiate as a single unit, their strength depends on the average benefit the supplier experiences in serving all the providers. If the supplier's incremental benefit of serving a single provider is less than its average benefit of serving all providers, then the bargaining principle implies that the GPO will negotiate a better deal than an individual provider.⁴⁴ One natural case in which a supplier's incremental benefit from an individual negotiation can be less than its average benefit from a group negotiation is if the time the supplier spends developing, negotiating, and managing each contract has valuable alternative uses.

IV.C.2. Volume and other discounts

GPOs contract for discounts that vary according to the amount of supplies that providers purchase. Volume and other discounts have efficiency properties that are well established in the economic literature.

One reason for volume discounts arises when the vendor's cost per unit declines with volume. For example, costs related to marketing, procurement, accounting, and shipping typically do not increase proportionately with the volume sold and therefore are likely to decline with the volume purchased. By standard economic arguments, it is both profitable and efficient in this case for vendors to compete for customers by offering them volume discounts, and such discounts reduce providers' costs, benefiting patients and taxpayers.

A second important efficiency-related reason for discounts arises from incentives vendors have to sell more or reach more customers. A supplier that has market power (such as a supplier of a differentiated medical device) generally has an incentive to charge a lower *marginal* price and sell a higher quantity to a buyer when it can offer volume discounts than when it is limited to charging a simple per-unit price.⁴⁵ A reduction in a per-unit price reduces the supplier's profit on all units sold, whereas a reduction in the marginal price under a volume discount schedule reduces price only on additional units sold. This motivation for discounts exists even if the supplier's costs do not decline with volume, and such discounts provide an important offset to potential harmful effects from supplier market power.

⁴⁴ The general principle is that if a supplier's *incremental value* declines with the number of buyers, then the buyers obtain lower prices by bargaining as a unit rather than individually. This principle is an important factor for many economic questions where bargaining is important, including incentives to form labor unions (H. Horn and Asher Wolinsky, "Worker Substitutability and Patterns of Unionisation," *Economic Journal* 98, no. 391 (1988): 484–97; H. Horn and Asher Wolinsky, "Bilateral Monopolies and Incentives for Merger," *RAND Journal of Economics* (1988): 408–19; Carl Davidson, "Multiunit Bargaining in Oligopolistic Industries," *Journal of Labor Economics* (1988): 397–422; Byoung Heon Jun, "Non-Cooperative Bargaining and Union Formation," *Review of Economic Studies* 56, no. 1 (1989): 59–76), cable TV pricing (Tasneem Chipty and Christopher Snyder, "The Role of Firm Size in Bilateral Bargaining: A Study of the Cable Television Industry," *Review of Economics and Statistics* 81, no. 2 (1997): 326–40), and contracts determined through bargaining within a firm (Lars Stole and Jeffrey Zwiebel, "Intra-Firm Bargaining under Non-Binding Contracts," *Review of Economic Studies* 63, no. 3 (1996); Lars Stole and Jeffrey Zwiebel, "Organizational Design and Technology Choice under Intrafirm Bargaining," *American Economic Review* 86, no. 1 (1996): 195–222).

⁴⁵ The effective *marginal* price is the amount the buyer is willing to pay for one additional unit of the product. Under a volume discount, this is the price that determines the amount the buyer purchases.

For example, suppose that a hospital would purchase 40 units of a product at a per-unit price of \$20 and 41 units at a per-unit price of \$19. The supplier would rationally reject an offer to sell 41 units at the lower price, because it lowers the supplier's total revenue ($40 \times \$20 = \800 , but $41 \times 19 = \$779$) and increases its costs (producing 41 units costs more than producing 40 units). If the marginal cost of the supply is below \$19, this is inefficient: the hospital values the supply at more than the cost of production, yet the sale does not occur. Volume discounts are one solution to this problem. For example, a volume discount that offers a price of \$20 for the first 40 units and \$18 for subsequent units will result in the 41st unit being sold and will benefit the supplier *and* the hospital.⁴⁶

This example illustrates a well-known result in the economic literature: “nonlinear price schedules”—that is, price schedules in which the unit price may vary with the amount purchased—can benefit both buyers and sellers.⁴⁷ The example shows how discounts in such price schedules can reduce healthcare costs by reducing the provider's costs.

GPOs play an important role in the process of negotiating discounts that reduce healthcare costs because they increase the scope for benefits from discounting. For example, consider an expensive machine that providers may or may not purchase—but, if they do, they will each purchase a single machine. In this case, the vendor has no incentive to offer a volume-based discount when dealing with individual providers. Contrast this with a situation where the providers form a GPO that pools their interests. In this case, the number of units that members of the GPO will purchase varies with price if the providers are willing to pay different amounts for the machine. Put differently, a volume discount to the GPO is an effective way to make additional sales.⁴⁸

In addition, GPOs often condition discounts on purchase shares rather than on volume. A benefit of this mechanism is that the optimal volume discount for some products is likely to vary across providers depending on a range of factors, including their size. By conditioning discounts on purchase share rather than on volume, GPOs are able to extend discounts to providers of all sizes with a single contract.⁴⁹ Accomplishing the same objective with volume discounts would require negotiating discounts provider by provider, which would defeat one of the two main purposes of GPOs—reducing transaction costs.

⁴⁶ The supplier increases revenue by \$18, to \$818. The hospital obtains the desired 41st unit.

⁴⁷ See Robert Willig, “Pareto-Superior Nonlinear Outlay Schedules,” *The Bell Journal of Economics* (1978): 56–69; and Hal R. Varian, “Price Discrimination,” in *Handbook of Industrial Organization*, vol. 1, ed. Richard Schmalensee and Robert D. Willig, chap. 10 (Amsterdam: North Holland, 1989).

⁴⁸ See Howard Marvel and Huanxing Yang, “Group Purchasing, Nonlinear Tariffs, and Oligopoly,” *International Journal of Industrial Organization* 26, no. 5 (2008): 1090–105. A related point is that suppliers may be willing to offer greater discounts when they have some assurance that the discounts will lead to greater sales. A GPO that represents many providers can help provide this assurance.

⁴⁹ Share-based discounts (sometimes known as fidelity rebates) have raised antitrust questions in certain situations in which they can be viewed in some ways as incomplete forms of exclusive dealing. However, the antitrust agencies recognize that share-based discounts may mimic volume discounts and reduce transaction costs (OECD, “Roundtable on Fidelity Rebates—Note by the United States,” 125th meeting of the OECD Competition Committee, June 15–17, 2016).

IV.C.3. More intense supplier competition

A recurring theme in the economic literature on procurement is that buyers can sometimes intensify competition among suppliers—and thereby obtain lower prices—by committing in advance to limit the number of supply sources.⁵⁰ Consistent with this economic theory, GPOs sometimes employ dual-source or single-source strategies to force suppliers to compete against each other and thereby obtain lower prices. GPOs state that they do this “when it is advantageous to their customers.”⁵¹ This strategy works because limiting the number of sources increases the intensity of bidding at the front end for the right to be sourced.

Dana (2012) examines this issue in a model explicitly motivated by the activities of GPOs. He shows that when providers have preferences for particular vendors (an example might be physician preference items), they will likely pay more for those vendors’ products when prices are determined through provider-specific auctions than when they are determined through a single-source auction held by a GPO. In particular, under many conditions, the vendors will lower their prices in the GPO-run single-source auction by more than enough to benefit even the providers that preferred another vendor at equal prices.⁵² The reason for the additional savings is that the single-source GPO auction intensifies up-front competition among vendors.

The idea that limiting the number of suppliers can benefit competition arises in the exclusive dealing literature as well. O’Brien and Shaffer (1997) show that when two differentiated suppliers compete through contracts with volume discounts to supply a single buyer (which is precisely what happens when a GPO aggregates the preferences of its members over available supplies), then buyers benefit from single-sourcing.⁵³ They benefit because single-sourcing intensifies competition for the sale, and this competition more than offsets the effects on buyers of any loss in product variety. When there are more

⁵⁰ See James J. Anton and Dennis A. Yao, “Split Awards, Procurement, and Innovation,” *RAND Journal of Economics* (1989): 538–52; Daniel P. O’Brien and Greg Shaffer, “Nonlinear Supply Contracts, Exclusive Dealing, and Equilibrium Market Foreclosure,” *Journal of Economics and Management Strategy* 6, no. 4 (1997): 755–85 [hereinafter “O’Brien and Shaffer (1997)”]; James Dana, “Buyer Groups as Strategic Commitments,” *Games and Economic Behavior* 74, no. 2 (2012): 470–85 [hereinafter “Dana (2012)”].

⁵¹ GAO (2014), 13.

⁵² Dana (2012), 471. Imagine two hospitals with different preferences between two vendors of a product, A and B. Hospital 1 values A’s product at \$10 and B’s product at \$9, while Hospital 2 has the opposite valuations—\$10 for B and \$9 for A. The cost of producing each product is \$1. In a provider-specific auction, the more highly valued vendor wins. The losing vendor bids down to its cost of \$1 in the losing effort (it will not go lower), and the preferred supplier bids \$2 to capture the \$1 premium the buyer is willing to pay for its product. Now suppose that the hospitals form a GPO that runs the same auction, committing to sole source the product. Assuming that the GPO represents the interests of the hospitals, the valuation of each product is now \$19: \$10 to one of the buyers and \$9 to the other. This means that neither vendor has an advantage in the auction, and competitive bidding will drive price down to cost, which is \$1. Instead of paying \$2 for its most preferred product, each hospital pays \$1 for the product from the vendor that the GPO selected. The GPO reduces hospital costs by \$2, and this exceeds the \$1 cost imposed on the hospital that does not receive its first choice. Dana (2012) shows that the idea behind this example holds in more complex situations with multiple suppliers.

⁵³ O’Brien and Shaffer (1997), 772. Suppliers are “differentiated” when some consumers prefer one supplier’s product over the other’s when the products have the same price.

than two suppliers, single-sourcing may not be the best strategy, but limiting the number of suppliers often will be.⁵⁴

⁵⁴ For example, in a symmetrically differentiated market with three suppliers, a buyer (such as a GPO) may do best by committing to purchase from two sources.

V. Nature of GPO competition

The market for procurement services offered by GPOs is fragmented, with at least five national GPOs,⁵⁵ many smaller players that operate regionally or locally,⁵⁶ and active self-supply by providers that also use GPO services. In addition, many GPOs are fully or partially owned by their member providers.⁵⁷ Both member ownership and the potential for self-supply are critical factors that make the market for GPO services significantly more competitive than it would be without these features.

Ownership by member providers creates an obvious constraint on a GPO's incentive and ability to engage in anticompetitive behavior that would harm its members. In fact, it creates a direct incentive for GPOs to do the opposite. Providers have no interest in using GPOs to increase their costs. Instead, they use GPOs to reduce their transaction costs and negotiate lower prices for healthcare products.

Importantly, the competitive constraint on GPOs imposed by member ownership does not require that all GPOs are member-owned. The reason is that member-owned GPOs compete for the same business as those GPOs that are not member-owned. If a GPO that is not controlled by its members were to engage in anticompetitive behavior, or simply provide less value, a member-owned GPO could attract business by offering providers a better deal. This is a powerful competitive constraint that is missing from standard markets in which firms are not controlled by their customers.

Providers' abilities to purchase healthcare products without using GPOs is another important constraint on GPO behavior. Although 96%–98% of hospitals use GPOs for *some* of their procurement services, hospitals purchase more than 25% of their healthcare products without the services of a GPO.⁵⁸ Johnston and Rooney (2012) describe five alternatives a provider has to purchasing at a price negotiated by any particular GPO: “(1) work through another GPO—the average hospital has two to four GPOs; (2) transact directly with the supplier; (3) re-offer the [request for proposal] through a specialized reverse-auction firm;⁵⁹ (4) use internal staff to organize a special purchase group of hospitals to make a bulk-purchase of the item outside of the GPO setting; and (5) buy off the shelf of a retailer or wholesale making an acceptable offer.”⁶⁰

⁵⁵ National players include Vizient, Premier, HealthTrust, Intalere, and Minnesota Multistate Contracting Alliance for Pharmacy (MMCAP). Membership of the first four listed includes providers in all segments, while MMCAP covers government facilities.

⁵⁶ The Healthcare Supply Chain Association reports that there are more than 600 GPOs nationwide (Healthcare Supply Chain Association, “A Primer on Group Purchasing Organizations: Questions and Answers,” accessed Sept. 6, 2016, [available at www.supplychainassociation.org/resource/resmgr/research/gpo_primer.pdf](http://www.supplychainassociation.org/resource/resmgr/research/gpo_primer.pdf)).

⁵⁷ Members of Premier, a publicly traded GPO with a national footprint, own 74% of the voting shares. Premier Annual Report, 40.

⁵⁸ Healthcare Supply Chain Association, “A Primer on Group Purchasing Organizations: Questions and Answers,” accessed Sept. 6, 2016, [available at www.supplychainassociation.org/resource/resmgr/research/gpo_primer.pdf](http://www.supplychainassociation.org/resource/resmgr/research/gpo_primer.pdf).

⁵⁹ “Reverse auctions” occur when providers bid for supplies offered by a vendor or third-party intermediary. For example, the prices that Litan et al. (2011) compared with GPO prices involved reverse auctions for medical devices.

⁶⁰ Johnston and Rooney (2012), 80–81.

Competitive performance in this type of market depends on the competitive interactions among GPOs, constraints imposed by member ownership, and how providers' use of self-supply responds to changes in price (the "elasticity of self-supply"). The more providers control their GPOs, the less power any competing GPO has—whether owned by members or not—to raise prices. The more providers can respond to GPO price increases by purchasing at prices they determine on their own (in other words, the more elastic the self-supply response to changes in GPO prices), the less power GPOs have to raise price.

V.A. Measuring competitive intensity

We are not aware of any studies of competition in the GPO market that document the effects on competition of member ownership and the elasticity of self-supply by providers. Therefore, we look for indirect measures of the intensity of competition in this market.

V.A.1. Insufficiency of standard concentration measures

A common measure of competitive performance that antitrust authorities use is the Herfindahl-Hirschman index of competition (HHI).⁶¹ Using the HHI to measure concentration in GPO services is difficult for many reasons, including the lack of systematic data on GPO sales. Even if data were available, however, it would likely understate the degree of competition that GPOs face for the reasons we have emphasized: GPO member ownership and the potential for self-supply by providers.

V.A.2. The numbers equivalent

An alternative approach to measuring the competitive performance of a market, useful when concentration data is limited or when concentration is likely to misrepresent competitive intensity, is the "numbers equivalent" of firms in the market in question.⁶² The numbers equivalent represents the number of equally sized competitors that would yield the observed average margin in a market if the competitors made independent production decisions.⁶³ A numbers equivalent of 10, for example, means that market

⁶¹ The HHI equals the sum of the squared market shares of all competitors in the market multiplied by 10,000. The Horizontal Merger Guidelines use this index to classify markets as highly concentrated, moderately concentrated, or unconcentrated, and antitrust authorities use this classification to help assess the likelihood of anticompetitive effects from mergers and other behavior that affects competition.

⁶² Several papers have used the numbers equivalent to measure competitive performance in many industries, including cigarettes (Daniel Sullivan, "Testing Hypotheses about Firm Behavior in the Cigarette Industry," *Journal of Political Economy* 93, no. 3 (1985): 586–98); Orley Ashenfelter and Daniel Sullivan, "Nonparametric Tests of Market Structure: An Application to the Cigarette Industry," *Journal of Industrial Economics* (1987): 483–98), banking (Sherrill Shaffer, "A Test of Competition in Canadian Banking," *Journal of Money, Credit, and Banking* 21, no. 1 (1993): 49–61), crude oil (Gary Libecap and Steven Wiggins, "Contractual Responses to the Common Pool: Prorating of Crude Oil Production," *American Economics Review* 74, no. 1 (1984): 87–98), and auditing (Reiner Quick and Matthias Wolz, "Concentration on the German Audit Market—An Empirical Analysis of the Concentration on the German Market for Stock Corporation Audits," *International Journal of Auditing* 3, no. 3 (1999): 175–89).

⁶³ Dennis W. Carlton and Jeffrey M. Perloff, *Modern Industrial Organization*, 3rd ed. (Reading, MA: Pearson, 1999), 153–93.

performance, as measured by the average margin, is the same as it would be with 10 competitors of equal size that make independent production decisions.⁶⁴

The main benefit of the numbers equivalent as a measure of competitive performance is that it provides a way to account for the two factors that make the GPO market more competitive than suggested by standard measures of concentration. In particular, the greater the competition resulting from member ownership or self-supply is, the higher the numbers equivalent will be. For example, in a market with six competitors, a numbers equivalent of 10 would mean that factors are at work that make the market operate more competitively than it would if the six competitors operated as independent, profit-maximizing companies. In the GPO business, the leading factors are member ownership and opportunities for self-supply.

V.A.3. Calculating competition in the healthcare procurement market

The numbers equivalent in a market is calculated using information on margins and the market elasticity of demand. The formula for the numbers equivalent is

$$NE = \frac{1}{[Average\ Margin] \times [Market\ Elasticity]}^{65}$$

To interpret this formula, observe that the numbers equivalent falls as the average margin increases. This shows that for a given market elasticity, lower margins indicate more competitive behavior, or effectively a higher “numbers equivalent” of competitors.⁶⁶

Given the number of GPO competitors, the member ownership of GPOs, and the ability of providers to engage in self-supply, we might expect a numbers equivalent for GPO services to be above the number of national GPOs (there are five). Consistent with this expectation, estimates using publicly available data on

⁶⁴ A firm’s margin equals its markup over marginal cost divided by its price. The lower the average margin in a market, the more competitively firms are behaving, other factors being equal.

⁶⁵ The formula for the numbers equivalent is derived as follows. Adelman shows that the numbers equivalent equals 1 divided by the HHI: $NE = 1 / HHI$ (Morris Adelman, “Comment on the ‘H’ Concentration Measure as a Numbers-Equivalent,” *Review of Economics and Statistics* (1969): 99–101 [hereinafter “Adelman (1969)”]). Cowling and Waterson show that the share-weighted average margin in a market with Cournot competitors equals the HHI divided by the market elasticity; i.e., $Average\ Margin = HHI / [Market\ Elasticity]$, or $HHI = [Average\ Margin] \times [Market\ Elasticity]$ (Keith Cowling and Michael Waterson, “Price-Cost Margins and Market Structure,” *Economica* 43, no. 171 (1976): 267–74). Putting these conditions together yields the formula for the numbers equivalent in the text. A firm’s margin equals its markup over marginal cost divided by its price. The market elasticity is the percentage reduction in quantity associated with a 1% increase in price. We follow the common convention of representing this elasticity as a positive number, even though the quantity demanded is negatively related to price.

⁶⁶ For any given average margin, the numbers equivalent also falls as the market elasticity increases. The explanation for this is as follows. The market elasticity measures the sensitivity of customers to price. Other factors being equal, margins should decline as the market elasticity rises, as customers become more sensitive to price. However, an increase in the elasticity for any given margin reduces the numbers equivalent, because the competitiveness of the market would have to fall (the effective number of competitors would have to decrease) to hold margins constant as the market elasticity increases.

GPO margins and the elasticity of demand for healthcare yield a numbers equivalent between 22 and 25, which indicates that the GPO market is performing as a highly competitive, unconcentrated market (see appendix). Even if we view these estimates as illustrative, as discussed in the appendix, it would take an error of more than 100% in the margin or elasticity estimates (or the product of the two) to obtain a numbers equivalent less than 10.

In summary, estimates of GPO margins and the elasticity of demand for healthcare suggest that the market for GPO services is highly competitive. The intense competition implies that the observed funding mechanism is likely to be more efficient than alternatives because, otherwise, one of the many GPOs could gain a competitive advantage by switching to an alternative funding mechanism. For example, if it were more efficient for GPOs to charge providers fixed fees for procurement services (as compared to the current norm of charging percentage fees to vendors), then any one of the five national or many regional GPOs could readily adopt that mechanism and gain customers from rival GPOs.

VI. GPO funding and the economics of tax incidence

We have presented evidence that GPOs reduce healthcare costs, and we have explained how this occurs through lower transaction costs and other benefits from joint purchasing. We have also explained that the market for GPO services appears to be highly competitive. This evidence indicates that the GPO market is performing well under the current funding mechanism. We now explain why altering the funding mechanism would likely not generate savings and, instead, would likely raise transaction costs in the market for procurement services.

VI.A. The neutrality principle

The actual incidence of GPO fees, meaning the extent to which fees are ultimately paid by vendors versus providers, does not depend on whether the fees are collected from vendors or providers. For that reason, the only economic basis to collect fees from one side or the other is administrative efficiency: fees should be collected in a way that minimizes transactions costs. As explained above, the high degree of competition among GPOs provides a strong basis to conclude that the observed funding mechanism is efficient. If the mechanism were not efficient, a GPO could gain at the expense of its rivals by introducing an alternative funding mechanism.

The fees collected by GPOs are economically identical to *ad valorem* taxes: when a sale is made through a GPO, the GPO takes a percentage. This is directly analogous to sales taxes; for example, when a customer buys a new pair of shoes, the government (rather than the GPO) collects a fee based on the value of the purchase. In either case, the economically salient point is that a fee is collected such that the buyer ultimately pays more than the seller receives.⁶⁷

One of the oldest results in public economics is that tax incidence is neutral with respect to the source of funding.⁶⁸ This result is the first one presented in the *Handbook of Public Economics* chapter on tax incidence⁶⁹ and is centrally featured in virtually every leading public economics textbook. An example helps illustrate this powerful principle and the logic behind it.

Suppose that a public authority requires revenue to fund a given program. A common method for raising funds is a sales tax, which collects a percentage of the price paid for some set of products sold to the

⁶⁷ If the price of shoes is \$40 and the sales tax is 10%, the customer pays \$44 but the vendor collects \$40. Alternatively, the tax could be nominally imposed on the seller. In that case, the price would be \$44 and the tax rate would be 9.1% (9.1% of \$44 is \$40). The end result is the same either way: the customer pays \$44 but the vendor collects \$40. The government (or the GPO) collects the \$4 difference.

⁶⁸ This seminal result traces from Jenkin (1872) to a recent extension to conditions of imperfect competition by Weyl and Fabinger (2013). See Fleeming Jenkin, "On the Principles Which Regulate the Incidence of Taxes," *Proceedings of the Royal Society of Edinburgh* 7 (1872): 618–31; Weyl and Fabinger (2013).

⁶⁹ See Laurence J. Kotlikoff and Lawrence H. Summers, "Tax Incidence," in *Handbook of Public Economics*, vol. 2, ed. Alan J. Auerbach and Martin Feldstein, chap. 16 (Amsterdam: North-Holland, 1987).

public.⁷⁰ A sales tax creates a wedge between the price paid by the buyer and the price received by the seller. If, for example, the price of a particular product is \$100 and the sales tax rate is 2%, then the after-tax price paid by buyers is \$102. The price received by sellers is \$100, and the \$2 difference goes to the tax authority.

This tax is levied on buyers in the sense that they pay 2% more than the price posted by sellers. Suppose instead that the same tax is levied on sellers. Continuing the prior example, if sellers set a price of \$102 for the product and pay a tax rate of 1.96% [$2/102$], then the after-tax price paid by buyers is again \$102, and the after-tax price received by sellers is again \$100 [$102 - (0.0196 \times 102)$]. Whether the tax is notionally levied on buyers or sellers makes no difference to the amount paid by the buyer or the amount received by the seller. Therefore, the total quantity transacted and total tax revenue are also the same no matter where the tax is imposed.⁷¹ Neither the after-tax prices paid and received nor the quantity sold depends on whether the tax is levied on buyers or on sellers.

Taxes necessarily lead to different prices paid and received by buyers and sellers than the price that prevails in the absence of any tax. A central question in taxation literature is how the incidence, or “burden,” of a tax is distributed between buyers and sellers. Distribution of the tax burden generally depends on the sensitivity of supply and demand to prices (i.e., supply and demand elasticities), the structure of the market, and the process used to determine price (competitive bidding, negotiations, etc.). However, *the distribution of the tax burden between buyers and sellers does not depend on where the tax is levied*. This is the neutrality principle. For illustration, the total tax burden in the above example is \$2. If the price would be \$101.50 in the absence of the tax and is \$102 with the tax, then the burden of the tax on buyers is \$0.50 (meaning the buyers pay \$0.50 more due to the tax) while the burden on sellers is \$1.50 (meaning the sellers receive \$1.50 less due to the tax).⁷² This is true whether the tax is levied on buyers or on sellers.

This example conveys an additional important point related to the transaction costs of tax programs. Although sales taxes are levied on buyers in the sense that the prices buyers pay exceed the prices posted by sellers, the sellers typically remit tax payments to the authority. Sellers provide this service because they can do so at lower cost than buyers, who are not in the habit of tracking and submitting sales tax payments for their manifold purchases. Shifting the remittance obligation to buyers would likely raise the transaction costs of sales tax administration significantly, as there are far more consumers than sellers.

⁷⁰ A tax based on the percentage of the price is called an *ad valorem* tax. Because administrative fees collected by GPOs take this form, we focus on this form of tax. It should be noted that the tax neutrality also holds for excise taxes based on the number of units sold.

⁷¹ With taxation, equilibrium still occurs where supply equals demand. For example, if buyers demand 5,000 units at a price of \$102 and sellers will supply 5,000 units at a price of \$100, then the equilibrium quantity will be 5,000 whether the taxes are collected from buyers or sellers. Tax revenue will also be the same: $\$2 \times 5,000 = \$10,000$.

⁷² Absent a tax, the buyer and seller pay and receive the same amount: \$101.50. With the tax, the buyer in this example pays \$102, or \$0.50 more. The seller receives \$100, or \$1.50 less. The buyer bears less of the incidence, or burden, of the tax, but that is completely unrelated to which party pays the tax.

The principle illustrated by this example—the neutrality of tax incidence with respect to where it is levied—is powerful and general. It holds in markets characterized by perfect competition, monopoly, and monopsony and in a wide range of intermediate cases.⁷³

VI.B. Implications of the neutrality principle for GPO funding

The neutrality principle has direct implications for the effects of prohibiting vendor-paid fees. A GPO is closely analogous to the “public authority” in the above example, and GPO fees are directly analogous to the tax. The entire tax neutrality discussion directly applies to GPO fees. As a result, we would expect that shifting fees from vendors to providers would not generate a cost reduction. Indeed, to the extent that vendor payments are the more efficient method of collecting payment, shifting to provider funding would actually increase costs.

As an illustration, consider a medical product sold by a single vendor at a cost of \$100, which includes all production and selling costs. Assume that a GPO negotiates on behalf of providers and incurs a cost of \$2 for its services. Thus, the total cost to the vendor of producing and selling the product, and to each provider acquiring the product, is \$102. (Assume, for simplicity, that other transaction costs are zero.) To keep the example simple, imagine that the GPO has all the bargaining power. We will show that it does not matter whether administrative fees are levied on the vendor or the providers, except for any transaction cost effects. The direct implication is that the determination of where to levy fees—on vendors or on providers—should be based solely on which locus entails lower transaction costs.

Suppose first that the GPO collects an administrative fee from the vendor, calculated as a percentage of the price paid by providers. The structure of payments is important to understanding this example: the GPO negotiates a price that providers will pay for supplies; that amount is paid to the vendor. The vendor then pays a percentage of that price to the GPO. To generate the greatest possible value for the providers it represents, the GPO will choose the lowest possible price of supplies: the price will be enough to cover the vendor’s cost, \$100, plus an amount sufficient to fund the GPO’s own cost, \$2. Thus, the price is \$102. The percentage fee is thus 1.96% [= 2/102].

The ultimate flow of funds for each sale with vendor-paid fees is as follows:

- The provider pays the GPO-negotiated price of \$102 to the vendor.
- The vendor then pays the fee of \$2 to the GPO, which is 1.96% of the GPO-negotiated price.
- At the end of the day, the provider pays \$102 in total, the vendor receives \$100, and the GPO receives \$2.

⁷³ See Weyl and Fabinger (2013) for an up-to-date discussion of principles of taxation.

Now suppose that the payment mechanism is altered so that an administrative fee is collected from providers instead. For each unit purchased, providers will pay some purchase price to the vendor and an administrative fee to the GPO. The lowest purchase price that covers the vendor's cost in this case is \$100, and the percentage fee that raises enough revenue to cover the GPO's \$2 cost is 2%.

The ultimate flow of funds for each sale with provider-paid fees is as follows:

- The provider pays the GPO-negotiated price of \$100 to the vendor.
- Separately, the provider pays \$2 to the GPO, which is 2% of the GPO-negotiated price.
- At the end of the day, the provider pays \$102 in total, the vendor receives \$100, and the GPO receives \$2.

Although pre-fee prices, percentage fee rates, and flow of funds differ, the after-fee payments under vendor-paid fees and under provider-paid fees are identical. That is, *the after-fee prices and total administrative fee paid do not change*. This is directly analogous to the standard economic result that tax incidence is neutral with respect to where taxes are levied. The result holds when the GPO represents multiple providers that acquire some of their needs outside the GPO, when the GPO represents the interests of the supplier rather than providers, and when the GPO pursues its own self-interest.⁷⁴

The neutrality principle implicitly assumes that the choice of funding mechanism has no effects on administrative costs in the supply acquisition chain. Because the funding source (providers or vendors) does not determine actual financial outcomes (net payments by providers, net collections by vendors, and GPO revenue), the natural inference is that the vendor-fee funding structure that has evolved in the highly competitive GPO market lowers administrative costs in the supply chain relative to alternatives.

It is worth noting that if vendor fees were eliminated, they would likely be replaced with provider fees that are also proportional to sales. Indeed, sales-based fees outperform other types of fees in many circumstances. When suppliers are differentiated and have some degree of market power, for example, such fees cause smaller quantity distortions than per-unit fees that collect the same amount of revenue.⁷⁵ Lump sum fees that are unrelated to sales often do even worse than per-unit fees, as they can price smaller participants out of the market. Sales-based fees have the merit of efficiently charging in proportion to services used, allowing smaller players to participate.

⁷⁴ Hu and Schwarz (2011) appear to be the first authors to develop a model that explicitly addresses the role of the source of GPO funding. In that analysis, the GPO controls the administrative fee, but competing suppliers choose prices to maximize their profits. The study finds that neutrality holds in that environment, too, consistent with the example here and the general validity of the neutrality result. See Qiaohai Hu and Leroy B. Schwarz, "Controversial Role of GPOs in Healthcare-Product Supply Chains," *Production and Operations Management* 20, no. 1 (2011): 1–15. See also Blair and Durrance (2014), which confirms the neutrality result under "all-or-nothing monopsony," where a GPO negotiates a price for specific supply and purchase commitments. Roger D. Blair, and Christine Piette Durrance, "Group Purchasing Organizations, Monopsony, and Antitrust Policy," *Managerial and Decision Economics* 35, no. 7 (2014): 433–43.

⁷⁵ Simon P. Anderson, Andre de Palma, and Brent Kreider, "Tax Incidence in Differentiated Product Oligopoly," *Journal of Public Economics* 81, no. 2 (2001): 173–92.

Because vendor-paid fees would likely be replaced by provider-paid fees of the same form, the neutrality principle indicates that the most likely effect of banning vendor fees would be to increase the transaction costs of procurement. The logic is that because the *source* of funding does not affect net payments, revenue, or quantity, the choice of where to collect the funds turns on transaction costs, including the costs of determining, collecting, and disbursing the fees. Both suppliers and providers benefit from lower transaction costs. This suggests that the current funding mechanism is likely to be the most efficient choice. As discussed in Part IV, the fact that many GPOs work with a far larger number of providers than suppliers also suggests that collecting fees from suppliers may be more efficient.

VII. Conclusion

This paper has examined the role of GPOs in reducing healthcare costs, the competitiveness of the market for GPO services, and the role of vendor-paid administrative fees in ensuring that benefits GPOs provide reduce healthcare costs for patients and taxpayers. Our findings are summarized as follows:

- Healthcare executives state that GPOs reduce their costs of procuring healthcare supplies and services by 10%–18%. Cost savings arise from reductions in transaction costs (such as eliminating thousands of negotiations) and lower prices for healthcare supplies and services.
- The cost savings created by GPOs are consistent with economic theory, which yields several mechanisms through which GPOs reduce costs and pass cost savings on to healthcare providers, reducing the cost of healthcare for patients and taxpayers.
- The market for GPO services is intensely competitive. Two factors make GPO markets significantly more competitive than one would infer from traditional measures of concentration alone:
 - Many GPOs are owned by their members, who have strong incentives to direct their GPOs to reduce transaction costs and negotiate lower prices.
 - GPO member providers can, and frequently do, purchase supplies and services on their own instead of through their GPOs.

An estimate of the competitive performance of the market for GPO services using the numbers equivalent confirms that this market is highly competitive.

- A fundamental principle in the economics of taxation—the neutrality principle—implies that there is likely nothing to gain and potentially much to lose from mandating a shift from vendor-paid to provider-funded fees. The most likely result of such a shift would be to increase transaction costs, raise the costs of entry into healthcare supply markets, raise the prices paid by healthcare providers for products and services, and raise healthcare costs for patients and taxpayers.

Our analysis shows that the GPO market is performing well for providers, patients, and taxpayers under its current funding regime. We find no empirical, economic, or policy basis for forcing GPOs to shift to an alternate funding mechanism.

VIII. Appendix: Numbers Equivalent Calculations for GPOs

The numbers equivalent calculations described in Part V use margin information from publicly traded GPOs and demand elasticity information from the economic literature on healthcare. The relevant margin for calculating the numbers equivalent is the average long-run margin of all GPOs competing in the market. We do not have access to margin information for all firms, but we can obtain a conservative estimate of the margin from the annual reports of two GPOs: Premier and MedAssets (predecessor to Vizient). These estimates are conservative because Premier and MedAssets were two of the largest GPOs, and larger firms have higher margins in the Cournot model that motivates the numbers equivalent.

After removing amortization costs associated with acquisitions, Premier's 2015 operating margin was 27%, and MedAssets' 2014 operating margin after the same adjustment was 24%.⁷⁶ According to a survey conducted by the RAND Corporation, empirical estimates of the elasticity of demand for healthcare center around 0.17.⁷⁷ If we assume that procurement services vary proportionately with the production of healthcare services and make the conservative assumption that healthcare providers pass no more than 100% of their cost increases to patients, then the elasticity of demand for healthcare is an upper bound on the elasticity of demand for procurement services.⁷⁸ Using the formula for the numbers equivalent, these margin and elasticity estimates generate the numbers equivalent values of 22 and 25 reported in Part V.⁷⁹

⁷⁶ See Premier, Inc. (2015) and MedAssets, Inc., *2014 Annual Report*, accessed Sept. 6, 2016, available at <https://www.sec.gov/Archives/edgar/data/1254419/000119312515073413/d825932d10k.htm>. MedAssets recently merged with Vizient, so 2014 is its most recent annual report.

⁷⁷ See Jeanne S. Ringel, Susan D. Hosek, Ben A. Vollaard, and Sergej Mahnovski, "The Elasticity of Demand for Health Care. A Review of the Literature and Its Application to the Military Health System" (Paper No. MR-1355-OSD, RAND National Defense Research Institute, Santa Monica, CA, 2002), xi.

⁷⁸ Procurement services are an input into the production of healthcare, and the demand for procurement services is a "derived demand" that depends on the demand for healthcare. Under the assumptions that procurement services vary proportionately with healthcare and providers pass no more than 100% of their cost increases into healthcare prices, the elasticity of the derived demand for procurement services is less than or equal to the elasticity of demand for healthcare. See Daniel Hosken, Daniel O'Brien, David Scheffman, and Michael Vita, "Demand System Estimation and Its Application to Horizontal Merger Analysis" (working paper, Bureau of Economics, FTC, Washington, DC, 2002), 23.

⁷⁹ The RAND survey reporting 0.17 as the centroid estimate of the elasticity of demand for healthcare reports a range of other estimates from ten different studies. In nine of the ten studies, the elasticity is low enough to yield a numbers equivalent greater than 6.67 and an effective HHI below 1,500, which is the threshold below which markets are considered unconcentrated. One study yields a higher numbers equivalent that implies that the market is moderately concentrated. The numbers equivalent calculations presented here depend critically on the margin and elasticity estimates and would change if further information indicated that different margins or elasticities were appropriate.

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Prior to joining Bates White, Dr. O'Brien taught economics at Northwestern, Michigan, Georgetown Law School, the University of Verona, Italy, and the Kelley School of Business, Indiana University. He has presented workshops on the economics of vertical restraints and horizontal mergers to economists at the FTC and DOJ. He has also been a frequent adviser to and presenter before foreign antitrust and regulatory authorities.

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Mr. Leibowitz is a partner in Davis Polk's Washington, DC, and New York offices. His practice focuses on the complex antitrust aspects of mergers and acquisitions as well as government and private antitrust investigations and litigation. He also provides counsel in the developing areas of consumer protection and privacy law as well as advocacy involving Congress.

Mr. Leibowitz was Chairman of the Federal Trade Commission from 2009 through 2013 and Commissioner from 2004 to 2009. While at the FTC, he presided over a major revision of the Horizontal Merger Guidelines in collaboration with the Antitrust Division of the Department of Justice. He also headed multiple delegations of American government officials with counterparts on antitrust and privacy matters, including to China and the European Union.

As Chairman, he was noted for leading the FTC's efforts to protect the privacy of consumers and police single firm conduct. His tenure resulted in multiple Supreme Court victories involving hospital mergers, pharmaceutical arrangements, and the State Action doctrines.

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