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BEFORE THE PENNSYLVANIA INSURANCE DEPARTMENT

# REPORT

# OF


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**&**

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## I. ASSIGNED TASK AND CREDENTIALS

1. The Pennsylvania Insurance Department ("PID") has retained David A. Argue, Ph.D. and Lona Fowdur, Ph.D. to provide an economic analysis of the competitive effects of the proposed transaction between CVS Health and Aetna Inc.

**David A. Argue, Ph.D.**

2. My name is David A. Argue. I am a Corporate Vice President and Principal at Economists Incorporated, an economic consulting firm with offices in Washington, D.C., San Francisco, and Tallahassee. I have been employed at Economists Incorporated since 1990. I have analyzed competition and performed damages analyses in various health care markets for government merger reviews and private antitrust litigation. I have also taught MBA-level courses in the economics of health care at the Carey Business School of Johns Hopkins University and authored several articles and presentations on health care competition matters. Among the health care areas in which I have consulting experience are hospitals, physician practices, ambulatory surgery centers, health insurance, prostheses, and pharmaceuticals. My recent experience includes trial testimony in *FTC v. Otto Bock HealthCare*. I have also testified at trial in *Saint Alphonsus et al. and FTC v. St. Luke's Health System* and before the Utah legislature about health care markets in Utah. I have attached a copy of my curriculum vitae as Exhibit 1.

**Lona Fowdur, Ph.D.**

3. My name is Lona Fowdur. I am a Senior Vice President at Economists Incorporated, and I have been employed at Economists Incorporated since 2009. I have a Ph.D. in economics from Cornell University. My areas of specialization are microeconomics and industrial organization, with applications to healthcare economics and regulation. I have provided economic analyses in many mergers and private litigation matters involving healthcare and insurance services. These matters have included competitive analyses and effects on consumer welfare of transactions between insurance companies, hospitals, physician practices and other healthcare providers. I have also conducted valuation analyses and calculations of damages in cases involving reimbursement rates, claims of unfair practices and anticompetitive conduct by healthcare providers, and allegations of reverse payments by drug manufacturers. I testified on behalf of the parties in the Anthem/Cigna merger trial. My prior engagements also include consulting services to state Attorneys' General offices on healthcare matters. I have attached a copy of my curriculum vitae as Exhibit 2.

4. To prepare this report, we have reviewed various submissions that CVS Health and Aetna made to the PID. We have also reviewed information that the parties and their economic experts submitted to the U.S. Department of Justice ("DOJ") in connection with the department's review of this transaction, other information

that the parties have submitted to the PID in connection with their proposed merger, and other publicly available information, including enrollment data from the Centers for Medicare and Medicaid Services ("CMS"), SEC filings and investor presentations, various industry reports, academic articles, and press releases. We have also interviewed representatives of various sellers of health insurance services in the Commonwealth of Pennsylvania.

## II. SUMMARY OF CONCLUSIONS

5. Based on our overall evaluation of the available information related to the sale of pharmacy benefit management ("PBM"), retail pharmacy, and immediate care services in Pennsylvania, we believe that the CVS Health-Aetna transaction is unlikely to result in harm to competition in any markets in the Commonwealth. Nevertheless, competitive conditions for each of these services can vary by geographic area within Pennsylvania, among certain types of customers, and over time. Consequently, it may be appropriate for the PID to ensure that CVS Health deals with Aetna's rivals on competitive terms and that it does not otherwise harm competition.

6. As requested and as our analytical approach dictates, we have carefully analyzed empirical information gathered from the parties as well as from public sources. We have applied our economic training and understanding of the models appropriate for evaluating horizontal and vertical competition. Regarding markets in which both CVS Health and Aetna provide services (i.e., horizontal competition), we conclude that potential harm to competition is unlikely, in part because CVS Health plans to divest the stand-alone Medicare prescription drug program ("PDP") business of Aetna. While there may be some concern about overlap between CVS Health and Aetna in the combined sales of PDP and Medicare Advantage prescription drug products ("MAPD"), we have not assessed whether the combined PDP/MAPD is actually a properly defined economic market.

7. We have also examined theories of harm to competition resulting from changing the supplier-purchaser relationship (i.e., vertical competition) between CVS Health and Aetna. Currently, CVS Health supplies PBM, retail pharmacy, and immediate care services to Aetna as well as to some other health plans that are competitors of Aetna. Various theories exist that an integrated CVS Health-Aetna would have an economic incentive to deal with Aetna's health plan competitors in ways that disadvantage those health plans in competing with Aetna.

8. We have conducted empirical analyses of these economic incentives related to vertical relationships and interviewed several of Aetna's competitors in Pennsylvania to determine whether CVS Health will have an ability to act on its economic incentives as an integrated provider in a manner that would harm Aetna's competitors. Our empirical analysis shows that, based on current market conditions, it is unlikely that CVS Health's integration with Aetna will give it the

power to harm Aetna's competitors. The economic gain that CVS Health might achieve in health plan markets from an attempt to disadvantage Aetna's competitors would likely be too small to offset the economic loss that strategy would incur in CVS Health's PBM, retail pharmacy, and immediate care businesses.

9. The qualitative information that we gathered from our interviews with Pennsylvania health plans that purchase PBM, retail pharmacy, and immediate care services is not entirely consistent with the empirical analysis. This type of information is helpful to the extent it illuminates market dynamics that the economic models may not capture fully. The health plans expressed concerns that the integration of CVS Health and Aetna would affect their ability to receive competitive bids for PBM, retail pharmacy and/or immediate care services. The concerns raised by the health plans are most plausible for plans or large employers with particular needs that either CVS Health alone or few other entities can satisfy. It is possible that such idiosyncratic circumstances exist among health plans or large employers in Pennsylvania, but we have not verified that the conditions are actually present.

10. We have also considered theories that Aetna would enter as or facilitate entry of another provider of PBM services but for the transaction. We conclude that sufficient alternative bidders of PBM services are already available to yield competitive prices and quality. Furthermore, there is no evidence that Aetna is a likely entrant into this market or that Aetna would facilitate some other entrant but for the transaction.

11. Finally, the parties represented that significant efficiencies will flow from the transaction, including reduced SG&A expenditures of $84 million in 2019 and $190 million in 2020 nationwide, of which $8.3 million in 2019 and $19.7 million in 2020 are specific to Pennsylvania. In addition, the parties project longer term medical savings related to better management of chronic conditions and medication adherence as well as redirection of patient care to lower cost providers. While we do not have sufficient information to evaluate the accuracy of these claimed savings, we note that they potentially could benefit consumers through reduced premiums and enhanced quality of care to the extent that they are realized.

12. As indicated above, our empirical analysis leads to the conclusion that on balance, the CVS Health-Aetna transaction is unlikely to result in harm to competition in any of the markets in which the parties participate, either through horizontal concentration or through a vertical theory of harm. Nevertheless, the concerns expressed by health plans in Pennsylvania may warrant certain actions by the PID to ensure that conditions do not change in a manner that could result in competitive harm or that idiosyncratic circumstances enable CVS Health to exercise market power against specific purchasers in any of these markets.

## III. INDUSTRY BACKGROUND

### A. Pharmacy Benefit and Retail Pharmacy Services Sold to Health Plans

13. Pharmacy benefit managers act as intermediaries between health plans, drug manufacturers, and pharmacies. PBM services include formulary design which establishes lists of covered prescription drugs at various patient-cost tiers and subject to various usage restrictions such as prior-authorization and step therapy.[1] PBMs also negotiate discounts from pharmaceutical drug manufacturers that are shared with their customers in the form of rebates. Another PBM service pertains to the administration of enrollees' drug benefits, pharmaceutical claims processing, and implementation of prescription-drug adherence programs.[2] PBMs also create networks of pharmacies, negotiate pharmacy-dispensing fees, and subsequently market the retail pharmacy services to their health plan customers.[3] The retail pharmacy networks are often supplemented with mail-order and specialty pharmacies.[4] PBMs are paid for their services through fees, retained rebates, and by other means.[5]

14. Among the sellers of PBM services are Caremark (a subsidiary of CVS Health), Optum (a subsidiary of UnitedHealth), and Express Scripts (which has entered into a merger agreement with Cigna). These three entities have the largest market shares measured by enrollment.[6] Several other sellers of PBM services compete for the business of health plans and large employers, including, EnvisionRX which is owned by RiteAid, Navitus, Argus, MedImpact, ClearScript, MagellanRX and PerformRX.[7] Since they are able to differentiate their services and provide the level of service customization that some health plan customers desire, these smaller PBMs are able to compete with the three largest PBMs for health plan business.[8] Some health plans operate internal PBMs, including Humana and a coalition of 22 Blue plans around the country which jointly own

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[1] Cole Werble (2017), "Pharmacy Benefit Managers." Health Affairs. Health Policy Brief #12. Available from https://www.healthaffairs.org/do/10.1377/hpb20171409.000178/full.

[2] *Id.*

[3] *Id.*

[4] *Id.*

[5] *Id.*

[6] *See* Publicly available analyses from Health Strategies Group. Available from https://www.healthstrategies.com/blog/select-emerging-pbms-gain-market-share. *Hereinafter* "Health Strategies Group, 2017."

[7] *Id.* Interviews from Pennsylvania health plans.

[8] *See* Statement of the Federal Trade Commission Concerning the Proposed Acquisition of Medco Health Solutions by Express Scripts, Inc. FTC File No. 111-0210, April 2, 2012. Available from https://www.ftc.gov/sites/default/files/documents/public_statements/statement-federal-trade-commission-concerning-proposed-acquisition-medco-health-solutions-express/120402expressscripts.pdf. Interviews of Pennsylvania health plans.

and operate Prime Therapeutics.[9] Anthem also plans to launch its own PBM, IngenioRX, in partnership with CVS Health, in 2020.[10]

## B. Health Insurance Products Sold to Groups and Individuals

15. Health insurers sell several types of products to groups and individuals. Products sold to individuals provide full insurance. Group customers may choose to fully insure or to purchase self-funded Administrative Service Only ("ASO") products. Medicare beneficiaries can choose between two types of plans: MAPD, which provides medical insurance bundled with a prescription drug plan, or original Medicare that may or may not be supplemented by a PDP product.[11]

16. Some health plans offer complex sets of products to a variety of consumers including individuals, groups and Medicare beneficiaries. These products often have different formularies, different levels of customization for large commercial customers, different degrees of difficulty for onboarding enrollees, and different prescription-drug adherence and management programs. Managing prescription-drug benefits at this level of complexity requires considerable administrative expertise that some health plans choose to outsource to PBMs.

17. Many sellers of health insurance operate in the Commonwealth of Pennsylvania. Aetna offers fully-insured and ASO plans to commercial customers, MAPD and stand-alone PDP plans to Medicare beneficiaries, as well as Medicaid and CHIP plans to eligible members.[12] Other health plan competitors to Aetna include Highmark, Independence Blue Cross, UPMC Health Plan, Capital Blue Cross, Geisinger Health Plan, UnitedHealth, Cigna, and Humana.[13] CVS Health offers only stand-alone PDP plans in Pennsylvania.[14] Other sellers of stand-alone PDP plans include RiteAid, WellCare, Express Scripts, and Mutual of Omaha.[15]

## C. Contracting Process Between Health Plans and PBMs

18. Contracting between health plans and PBMs occurs through bilateral negotiations. This process often begins with health plans posting requests-for-proposals ("RFPs") for services, and PBMs respond with bids to offer their services to

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[9] *See* https://www.humana.com/agent/products-and-services/pharmacy/solutions and https://www.primetherapeutics.com/en/about/company.html.

[10] *See* https://www.ingenio-rx.com/#FAQ-block.

[11] *See* United States of America v. CVS Health and Aetna, Case 1:18-cv-02340, p. 3. *Hereinafter* "DOJ Complaint." Available from https://www.justice.gov/atr/case-document/file/1100091/download.

[12] *See* Aetna Annual Report for the Year Ended December 2017, Form 10-K, pp. 6-7. Available from http://investor.aetna.com/phoenix.zhtml?c=110617&p=irol-sec#15474509. *Hereinafter* "Aetna Form 10-K."

[13] Aetna Form 10-K, pp. 32-33.

[14] CVS Annual Report for the Year Ended December 2017, Form 10-K, p.5. Available from http://investors.cvshealth.com/sec-filings. *Hereinafter* "CVS 2017 Form 10-K."

[15] Plan availability is available from https://q1medicare.com/PartD-SearchPDPMedicare-2019PlanFinder.php#results.

health plans.[16] Commonly, health plans negotiate final prices and terms with the best bidder using leverage from the second-best bidder to ensure that the plan receives competitive prices and quality.[17]

19. Some PBM services are provided in-house by health plans and hence the scope of services included in each contract may vary. For example, some health plans create and administer their own formularies, rather than relying on the PBM's standard formulary.[18] Other health plans perform their own customer-service functions or operate their own specialty pharmacies.[19]

20. Conducting a full RFP process for PBM services is often costly and time consuming. As a result, health plans may hire consultants to perform periodic market checks of pricing for PBM services in lieu of going through the full RFP process. These checks may allow health plans to renegotiate terms with their incumbent service providers when appropriate.[20]

## IV. CVS HEALTH'S ACQUISITION OF AETNA

### A. Services Provided by CVS Health

21. CVS Health operates a retail pharmacy chain with more than 9,800 stores around the country.[21] These pharmacies dispense prescriptions, provide patient counseling, monitor medication adherence and recommend cost-effective drug therapies.[22] CVS Health also has specialty pharmacies that address the pharmaceutical needs of individuals with certain chronic or genetic diseases.[23]

22. CVS Health also operates CVS Caremark, which provides a full range of PBM services to more than 94 million PBM plan members.[24] These services include administration of pharmacy claims, managing formularies, providing mail-order and specialty pharmacy services, managing retail pharmacy services, and prescription-management services, among others.[25]

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[16] Interviews of Pennsylvania health plans.
[17] *Id.*
[18] *Id.*
[19] *Id.*
[20] *Id.*
[21] CVS Health information. Available from https://cvshealth.com/about/facts-and-company-information.
[22] Form-A Statement Regarding the Acquisition of Control of or Merger with a Domestic Insurer by CVS Health. Filed with the Pennsylvania Insurance Department on January 9, 2018, p.4. Available from https://www.insurance.pa.gov/Companies/IndustryActivity/CorporateTransactionsofPublicInterest/CVS_Aetna/Pages/CVS-Aetna.aspx. *Hereinafter*, "CVS Health Form-A."
[23] *Id.*
[24] *CVS Health Information*, CVS 2017 Form 10-K, p. 3.
[25] *Id., p. 4.*

23. CVS Health's SilverScript Insurance Company subsidiary offers Medicare prescription-drug coverage.[26] This coverage is for stand-alone PDP products and does not include any Medicare Advantage coverage.

24. CVS Health also provides immediate care services at more than 1,100 MinuteClinics.[27] Its nurse practitioners and physician assistants "diagnose and treat lower-acuity health conditions, conduct health screenings, monitor chronic conditions, and provide wellness and vaccination services."[28]

### B. Services Provided by Aetna

25. Aetna is a health insurance company that provides medical benefits to 22 million individuals.[29] It offers a range of products to commercially insured groups and individuals, Medicare Advantage and stand-alone PDP products to Medicare-eligible individuals, and CHIP and Medicaid plans to Medicaid-eligible enrollees.[30] Aetna's products include traditional and consumer-directed health insurance as well as dental coverage, behavioral health products and disability plans.[31]

26. Since 2010, CVS Health has performed several PBM functions for Aetna.[32] The services provided by CVS Health to Aetna include the administration of selected functions for retail pharmacy contracting and claims administration, home delivery and specialty pharmacy order fulfillment and inventory purchasing and management, and certain administrative services.[33]

## V. Parties' Arguments of Benefits of the CVS Health-Aetna Transaction

27. CVS Health asserts that its combination with Aetna will allow the integrated entity to "[p]rovide treatment at the best site of care and improve care across the continuum through greater collaboration among Aetna's in-network physician and hospital providers," and at other care locations operated by the combined entity, including CVS retail and specialty pharmacies, MinuteClinics, and infusion centers.[34] CVS Health further states that the combined entity will invest in innovative ways to improve outcomes for patients, including through the broader use of data and analytics to improve chronic care management and patient

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[26] *Id., p. 3.*
[27] CVS Health information.
[28] CVS 2017 Form 10-K, p.9.
[29] Aetna 2017 Form 10-K, p. 58.
[30] *Id.*
[31] *Id.*, pp. 13, 36, 58-59.
[32] *Id.*, p. 7.
[33] *Id.*
[34] CVS Health Form-A, p. 3.

adherence to medication and treatment protocols.[35] Further, CVS Health states that the transaction will create opportunities to generate efficiencies by combining corporate functions, obtaining improved pricing from suppliers and merging complementary expertise in pharmacy and medical benefits.[36] All of these initiatives are intended to reduce overall healthcare costs while maintaining and improving quality and patient care services.

### A. Overall Near-Term Cost Savings

28. CVS Health has developed estimates of cost savings and efficiencies that it believes it can accomplish within the first year to two years after the transaction, and those that would be implemented in years three through five.

29. The near-term savings derive from traditional sources like combining overlapping operations and eliminating duplicative corporate functions, as well as some medical cost savings stemming immediately from the combination. As of September 2018, CVS projected overall company-wide near-term cost savings of $742 million annually.[37] A significant portion of those savings ($205 million) is related to corporate functions like general and administrative costs and otherwise controllable expenditures. Other overlapping services that would be consolidated include PBM functions and "front-end" mail order and specialty pharmacy services. CVS Health also anticipates cost savings that would arise directly from combining CVS and Aetna PDP operations. These savings would not materialize for Aetna's stand-alone PDP business, however, since CVS Health has agreed to divest that component of Aetna's business. Finally, CVS Health expects to achieve cost savings from improved care management and shifting care to lower-cost sites.[38]

### B. Overall Longer-Term Cost Savings

30. CVS Health estimates that overall longer-term cost savings from the transaction would be even greater in years three to five.[39] Most of this cost savings would come from medical cost savings related to chronic care. The parties anticipate being able to "reduce spending on high-cost, complex patients through improved care management (e.g., post-discharge support, medication adherence, reducing drug expenditures)."[40] Additional longer-term savings are expected by the parties

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[35] *Id.*
[36] *Id.* p. 4.
[37] Confidential Form E Supplemental Information, CVS Health Response to Pennsylvania Insurance Department Request Regarding Benefits from the Proposed Transaction, Section I.A., September 10, 2018.
[38] *Id.*
[39] *Id.*
[40] *Id.*

to derive from shifting patient care to lower-cost sites as appropriate and improving Aetna's Medicare Advantage product.[41]

# VI. Theories and Evidence of Potential Harm to Competition from the CVS Health-Aetna Transaction

## A. Horizontal Overlap in Medicare Prescription Drug Programs

31. Horizontal overlaps are defined and analyzed in antitrust reviews in the context of properly defined antitrust markets. The purpose of defining a market is to identify a set of reasonably interchangeable alternatives to which consumers could turn in the event of a small price increase by one or more sellers.[42] The two aspects to market definition are to identify the set of relevant products that compete, or the relevant product market, and to identify the geographic area over which these products compete, or the relevant geographic market.

32. CVS Health's only offering to Medicare beneficiaries is stand-alone PDP services. Aetna sells both stand-alone PDP and MAPD services. Therefore, an appropriate focus for considering horizontal overlap is in sales of products marketed to Medicare beneficiaries.

### *1. Market Definition: Product Market*

33. Medicare beneficiaries have two main choices for prescription drug coverage. Beneficiaries who choose to enroll in original Medicare, a fee-for-service plan operated directly by the Federal government, can separately decide to purchase a stand-alone PDP plan.[43] Alternatively, beneficiaries can enroll in MAPD plans, which include prescription drug coverage along with medical coverage. In 2018, the average Medicare beneficiary will have a choice of 23 stand-alone PDPs and 17 MAPD plans.[44]

34. In its Complaint against the merger, the DOJ concluded that stand-alone PDP and MAPD plans are not close substitutes because beneficiaries rarely switch between the two types of products and because CVS Health, Aetna and other market participants treat stand-alone PDP plans as distinct from other products.[45] As a

[41] *Id.*

[42] U.S. Department of Justice and Federal Trade Commission, Horizontal Merger Guidelines (2010). Available from http://www.justice.gov/atr/public/guidelines/hmg-2010.pdf. *Hereinafter*, "Horizontal Merger Guidelines, 2010."

[43] DOJ Complaint, p.3.

[44] Juliette Cubanski et al., (2017), "Medicare Part D: A First Look at Prescription Drug Plans in 2018." Henry J. Kaiser Family Foundation Issue Brief, p. 2. Available from http://files.kff.org/attachment/Issue-Brief-Medicare-Part-D-A-First-Look-at-Prescription-Drug-Plans-in-2018. In Region 6, beneficiaries have access to 26 stand-alone plans. *Id.*

[45] DOJ Complaint, p.8.

result, the DOJ concluded that the stand-alone PDP product passes the test for a relevant product market as established in the Horizontal Merger Guidelines.[46] Indeed, the DOJ cleared the CVS Health-Aetna transaction subject to the divestiture of just Aetna's stand-alone PDP services, again based on the determination that stand-alone PDP services represent a separate product market.[47]

35. The parties' economic experts have argued, however, that Medicare beneficiaries can switch plans from MAPD to original Medicare and stand-alone PDP plans at no cost, and that CMS tools facilitate switching by allowing beneficiaries to compare plans and choose among PDP and MAPD plans that they find most desirable.[48] The parties' Form E submissions also include share calculations for both stand-alone PDP and combined PDP/MAPD enrollment.

36. As a result, we have considered both the stand-alone PDP and combined PDP/MAPD products as potential relevant product markets.

### *2. Market Definition: Geographic Market*

37. CMS has established 34 regions within the United States across which stand-alone PDP services are sold.[49] Each plan sponsor charges the same PDP premium across an entire region. CMS Region 6 for Pennsylvania and West Virginia comprises a potential relevant geographic market, as does Pennsylvania alone.[50]

38. MAPD services are sold within specific counties in Pennsylvania, but the same sellers often sell in multiple counties and there are no barriers that impede sellers within a subset of counties to sell their products state-wide.[51] We have, however, observed that there is considerable variation in the parties' and their competitors' shares across individual Pennsylvania counties, which indicates that the competitive dynamics vary in different parts of Pennsylvania. As a result, there is an argument that the geographic market may be smaller than the entire Commonwealth.

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[46] *Id.* A combined Medicare Advantage and original Medicare market was similarly rejected by the United States District Court for the District of Columbia in *United States of America, et al. v. Aetna Inc., et al., Civ. Action No. 16-1494*, based on the finding that the two products were not sufficiently interchangeable to belong in the same product market.

[47] United States v. CVS and Aetna Questions and Answers for the General Public, October 10, 2018. Available from https://www.justice.gov/opa/press-release/file/1099806/download.

[48] Confidential Economists' Report Supplementing Form E Submission to the Commonwealth of Pennsylvania, submitted May 16, 2018, pp. 6-7. *Hereinafter* "Form E, Economists Report."

[49] DOJ Complaint, p.3.

[50] Form E, Economists Report, pp. 8-9.

[51] *See* Gretchen Jacobson et al., (2018), "Medicare Advantage 2019 Spotlight: First Look." Henry J. Kaiser Family Foundation Data Note. Available from https://www.kff.org/medicare/issue-brief/medicare-advantage-2019-spotlight-first-look.

### *3. Competitive Concern*

39. The theory of harm related to a horizontal overlap between CVS Health and Aetna is that the transaction would reduce alternatives for stand-alone PDP or PDP/MAPD combined. If concentration were to increase in a competitively significant manner, above-competitive pricing or below-competitive quality could result.

40. The standard for the PID to determine whether a horizontal combination is presumed to cause harm to competition is set forth in Pennsylvania statute, 40 P.S. § 991.1403.[52] The statute considers markets in which the four largest competitors have a combined share of more than 75% to be highly concentrated. In such markets, a prima facia violation of competitive standards occurs when merging parties' shares are as follows:

| Insurer A | Insurer B |
|---|---|
| 4% | 4% or more |
| 10% | 2% or more |
| 15% | 1% or more |

41. If the market is not highly concentrated, a prima facia violation of competitive standards occurs when merging parties' shares are as follows:

| Insurer A | Insurer B |
|---|---|
| 5% | 5% or more |
| 10% | 4% or more |
| 15% | 3% or more |
| 19% | 1% or more |

### *4. Evidence for Stand-Alone PDP and PDP/MAPD Products in Pennsylvania*

42. CVS Health has committed to divesting the stand-alone PDP business of Aetna and its First Health subsidiary, thereby eliminating any overlap with CVS's stand-alone PDP business.[53] The divestitures imply Aetna's share of stand-alone PDP business in Pennsylvania and in Region 6 will be zero. As a result, the parties' shares in the stand-alone PDP market do not meet the thresholds established in the Pennsylvania statute to provide evidence of a prima facie violations of competitive standards.

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[52] The approach articulated in the Pennsylvania statute is substantially more stringent than the thresholds that are presumed to be likely to enhance market power, as defined in the *Horizontal Merger Guidelines* of the Department of Justice and Federal Trade Commission. *See* Horizontal Merger Guidelines, 2010, § V.

[53] Aetna Press Release, September 27, 2018. Available from https://news.aetna.com/news-releases/aetna-agrees-to-sell-all-standalone-medicare-part-d-business.

43. To the extent that combined PDP/MAPD constitute a relevant product market, a competitive overlap would remain in that market. The parties' and their competitors' shares for the combined product, based on September 2018 enrollment data from CMS, are shown in the table below.

**PDP/MAPD Enrollment Shares for Region 6 and Pennsylvania**
**September 2018**

| Health Plan | Region 6 | Pennsylvania |
|---|---|---|
| Aetna Life Insurance Company | 11.8% | 12.3% |
| CVS Health/Silverscript Insurance Company | 14.7% | 14.8% |
| Aetna + CVS Health | 26.5% | 27.1% |
| Highmark | 12.3% | 13.8% |
| UnitedHealthCare | 12.0% | 11.9% |
| Humana | 12.7% | 9.5% |
| UPMC | 7.2% | 8.4% |
| Independence Blue Cross | 4.5% | 5.1% |
| Medco (Express Scripts) | 5.1% | 4.7% |
| Geisinger Health | 3.8% | 4.4% |
| Wellcare Prescription Insurance, Inc. | 4.6% | 4.4% |
| Cigna Health and Life Insurance Company | 3.6% | 3.6% |
| Envision Insurance Company | 3.5% | 3.5% |
| Capital Blue Cross | 1.4% | 1.6% |
| Health Partners Plans, Inc. | 0.8% | 0.9% |
| All Others | 2.0% | 1.1% |

**Note:** Aetna's stand-alone PDP enrollment is attributed to Wellcare.
**Sources:** CMS PDP and MAPD enrollment data, September 2018.

44. For both the region and the Commonwealth, combined shares of the top four competitors for PDP and MAPD combined do not exceed the 75% four-firm threshold for highly concentrated markets, as defined in the Pennsylvania statute. In each of these areas, the merging parties have shares of least 4% each, thus triggering a prima facia finding of a violation of statutory competitive standards according to Pennsylvania statute.

45. The statute explains that despite the presence of a prima facie violation of competitive standards, the parties may demonstrate the absence of anticompetitive effects based upon factors such as market shares, volatility of ranking of market leaders, number of competitors, concentration, trend of concentration in the industry and ease of entry and exit into the market.

46. The above table shows that several competitors have shares that are comparable or a few percentage points below Aetna's and CVS Health's, including Highmark, UnitedHealth Care, Humana, UPMC, Independence Blue Cross and Express Scripts. Since they do not face barriers to expansion and could easily expand,

these competitors will likely continue to provide vigorous competition to the merged entity post-merger.[54]

## B. Vertical Foreclosure of PBM Services to Competing Health Plans

### *1. Theory of Competitive Harm*

47. When certain conditions are present, the acquisition of an input supplier may provide an economic incentive for an integrated entity to withhold the input from or increase the price of the input to downstream competitors. This conduct is generally referred to as "input foreclosure," although input price increases due to vertical integration can also be assessed under a theory of "raising rivals' costs."[55]

48. When downstream competitors experience an increase in input costs (either directly or because they must switch to another input supplier) they may pass on the cost increase to consumers through increased prices of the downstream product. The price increase of the downstream product harms consumers directly, and in addition, it can cause a reduction in the sales of non-integrated suppliers, thereby strengthening the market position of the integrated supplier and potentially enabling it to raise prices.

49. Certain conditions are necessary for this theory of vertical foreclosure to be valid in health insurance and PBM services markets. First, the integrated entity must have an ability to foreclose downstream rivals and, second, it must have an ability to capture downstream sales that the rivals lose due to foreclosure of PBM inputs.

50. The ability to foreclose rivals hinges on the availability of alternative providers of PBM services. Profitable foreclosure requires there to be sufficiently few alternative suppliers of PBM services such that the downstream health plan is unable to avoid the foreclosure by the integrated PBM provider. In other words, the elasticity of demand for the integrated PBM services must be sufficiently low that few health plans would turn to alternative PBM providers in the event the integrated provider raised its PBM prices to competing health plans. Alternative providers of PBM services include non-integrated PBM suppliers and any other integrated PBMs that do not have an incentive to foreclose. In-house production of PBM services by downstream health plan competitors are also valid alternatives.

51. For the integrated entity to be able to capture rivals' lost sales, downstream health plan competitors must pass through to consumers at least some of the increased PBM costs in the form of higher health insurance premiums or ASO prices. In

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[54] We reviewed county and regional data and in no area are the shares of CVS, Aetna, and their competitors such that our conclusions would be different if the geographic markets were regions or counties within Pennsylvania.

[55] Serge Moresi and Steven Salop (2013), "vGUPPI: Scoring Unilateral Pricing Incentives in Vertical Mergers." *Antitrust Law Journal*, 79(1): 185-214. *Hereinafter* "Moresi and Salop (2013)."

response to higher prices, at least some downstream customers must switch to the integrated health plan, rather than to other competitors. Further, the integrated health plan must capture sufficient diverted sales and profits from downstream health plan competitors to offset forgone profits attributed to the integrated PBM's loss of upstream sales due to input foreclosure.

### 2. *Assessment of the Conditions for Input Foreclosure of PBM Services by CVS Health to Health Plans that Compete with Aetna in Pennsylvania*

#### i. *The Ability to Foreclose Depends on the Competitiveness of the PBM Services Market in Pennsylvania*

52. To the extent that the PBM services market in Pennsylvania is competitive, vertical integration between CVS Health and Aetna will not create an ability for the integrated entity to foreclose its downstream rivals because an attempt to raise prices will simply result in Caremark losing sales to other PBM competitors.

53. Some health plans in Pennsylvania maintain that not all PBM service providers have sufficiently sophisticated capabilities to manage the complexity of the plan's prescription-drug benefits. The three largest PBMs identified above are Caremark, Express Scripts and Optum. These three PBMs ostensibly have built high levels of IT infrastructure and developed substantial experience that enables them to handle multiple formularies, manage the unique demands of large self-funded accounts, migrate large accounts between health plans, provide sophisticated reporting tools, accommodate CMS audits, and negotiate aggressive discounts and rebates with manufacturers. In the view of some of the Pennsylvania health plans, mid-sized and smaller PBMs do not have sufficient experience, skills, or scale to provide those services.

54. Some Pennsylvania health plans indicate, however, that mid-size PBMs can be more flexible in customizing their service offerings to meet the specific needs of the health plans' customer segments.[56] Service differentiation enables mid-sized PBMs to provide competitive services even though they may lack some of the advantages in negotiating pharmaceutical pricing that size conveys.

55. It is not clear that the PBM services market is non-competitive notwithstanding that it includes a small number of large suppliers and a modest number of mid-sized suppliers. Even though there are few large PBM service suppliers, PBM services typically are purchased through a bidding process that lends itself to competitive outcomes. Interviews with health plans identified examples of the use of the second-best bidder to leverage better prices and terms from the top bidder. In that bidding context, the bids of the third-best and other suppliers do not influence the final terms accepted by the health plan.

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[56] Interviews of Pennsylvania health plans.

56. In addition to Caremark, two other large PBM service providers – Express Scripts and Optum – are available and already used by non-integrated health plans in Pennsylvania. They are commonly among the bidders responding to health plans' RFPs and are also included in market checks by health plans. The availability and ongoing use of two other large PBMs by health plans in Pennsylvania suggests that CVS Health faces a significant risk that health plan customers would substitute away from Caremark if it attempted to increase PBM prices. CVS Health's business documents discuss these risks and state a need to offer competitive discounts to retain existing business.[57] Even if all three large PBMs became vertically integrated and each had an incentive to favor its own health plan, they would all retain the competitive incentive to take customers from each other, thereby not changing the current competition among PBMs.

57. In the context of a bidding model, three integrated PBMs theoretically bidding for a contract could result in better pricing relative to two integrated PBMs and an unintegrated PBM, especially when cost efficiencies due to integration are present. When an integrated PBM submits a competing bid against the unintegrated PBM, it only needs to slightly undercut the bid of the unintegrated and cost-disadvantaged PBM to win the bid. If two integrated PBMs bid head-to-head, however, they both have an incentive to pass on their cost advantages to outbid the other.

58. Among the mid-sized PBM service providers available to Pennsylvania health plans are MedImpact, currently used by at least one health plan in Pennsylvania, and Prime Therapeutics. IngenioRX, the new PBM being established by Anthem (in some sort of partnership with CVS Health), is likely to become available in 2020, but the details of how it will operate are not fully available.[58] If CVS Health simply provides PBM functions to Anthem without sharing in Anthem's profits, CVS Health will not gain an incremental ability to foreclose Aetna's competitors through Anthem's health plan volume. Even if the partnership allowed CVS Health to profit from Anthem's health plan volume, Anthem's Blue territory does not include Pennsylvania, so Anthem cannot compete directly with its Blue-branded products for accounts headquartered in Pennsylvania. The implication is that CVS Health will not be able to capture Aetna's foreclosed rivals' lost sales in Pennsylvania through its Anthem partnership because Anthem does not operate in the state.

59. Some PBM services are provided in-house by health plans. The most common of these evident from interviews with Pennsylvania health plans are formulary design, pre-authorization, prescription drug adherence programs, and customer

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[57] *See* CVS Form 10-K, p.17; CVS Health CONFIDENTIAL HSR Information submitted to the DOJ: 4(c)-002 Strategy Update Presentation 09.19-20.2017, p. 62.

[58] *See* https://www.ingenio-rx.com/#FAQ-block. IngenioRX may serve as another PBM alternative to health plan customers thereby providing additional competition for PBM services. Anthem does not have an ability to foreclose other health plans in Pennsylvania because it does not compete for health plan enrollees in Pennsylvania.

service. Those services would not be subject to non-competitive pricing by PBM service providers because health plans could easily avoid using PBMs for these services.

60. Also informative to the competitiveness of PBM markets are the profit margins of suppliers. If the PBM market were non-competitive, it would be expected to produce above-competitive profits. Publicly available information and CVS data reflect only modest and declining profitability of PBMs. This margin information is not consistent with concentration in PBM markets having created market power. The FTC referenced these margin trends in its public statements subsequent to closing its investigation of the Express Scripts/Medco merger in 2012 and CVS Health's more recent Form 10-K also allude to low industry margins and ongoing pricing pressure for PBM services.[59]

61. Further, Caremark has a share of 26% of PBM enrollment nationwide and several health plans in Pennsylvania do not use Caremark, including those with integrated PBMs such as UnitedHealthcare and Humana.[60] As a result, CVS Health/Caremark does not have an ability to target all of Aetna's competitors for input foreclosure. The implication is that lost sales from foreclosed rivals will be split between Aetna and other rivals that an integrated CVS Health cannot foreclose, thereby diminishing any potential gains from foreclosure.

62. One additional possible cause of concern relates to costs to health plans of switching from one PBM service provider to another. In principle, health plans for which switching costs are highest would be most likely to accept higher PBM prices from the incumbent supplier of services instead of switching providers. Switching costs for PBM services are not related to or exacerbated by vertical integration, however. Competing PBMs must overcome health plans switching costs to win new health plan business regardless of the extent of vertical integration.

*ii. Aetna's Ability to Capture Sufficient Enrollees from its Health Plan Competitors to Offset Lost Profits by CVS Health in PBM Services Sold to Other Health Plans*

63. The profitability of a vertical foreclosure strategy by CVS Health is determined by comparing the profit gains from sales diverted to Aetna (i.e., increased health plan revenue times contribution margin) and the profits lost from health plans switching PBM services away from Caremark.

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[59] *See* Statement of the Commission re. The Proposed Acquisition of Medco Health Solutions, Inc., by Express Scripts, Inc., April 2, 2012, pp. 2-3. Available from https://www.ftc.gov/enforcement/cases-proceedings/closing-letters/proposed-acquisition-medco-health-solutions-inc. CVS Form 10-K, pp. 16-17.

[60] Health Strategies Group. 2017.

a) Empirical Analysis of Shares and Margins

64. A common approach for estimating the sales captured by one supplier from those that a competing supplier loses is to calculate a "diversion ratio." A diversion ratio is equivalent to the supplier's share of residual sales excluding the competitor's sales. Thus, an estimate of the volume of the foreclosed health plan's sales that Aetna could recapture is equivalent to Aetna's share of market excluding the disfavored health plan's share. The value of those diverted sales can be measured with Aetna's contribution margin.

65. The foregone profits of an attempt by a vertically integrated CVS Health to raise rivals' PBM costs is affected by the revenue it receives for PBM services provided to other health plans, the revenue it generates from Aetna for PBM services, and the likelihood of health plans switching from Caremark to another PBM.

66. One way to measure the balancing of these economic forces is with the "vGUPPIu" which stands for Vertical Gross Upward Pricing Pressure Index for the Upstream rival.[61] The formula for the vGUPPIu takes into account the various factors described above and measures the financial incentive of a vertically integrated entity to raise the price of inputs it sells to downstream rivals.

67. With data provided by CVS Health and from public sources, the calculated vGUPPIu's for CVS Health in Pennsylvania are small under different reasonable assumptions.

68. Using the standard model for diversion described above, the likelihood of Aetna capturing health plan sales from other disfavored rival plans is low because Aetna's shares are low in the regions where potentially disfavored Pennsylvania insurers also compete. Based on enrollment shares for Aetna and other potentially disfavored health plans in Pennsylvania, the share-based diversion ratios from those competing plans to Aetna is between 16.5% and 21.1% for Medicare enrollment and between 14.1% and 23.3% for all other enrollment.[62]

69. Not only is the likelihood of Aetna capturing diverted health plan enrollment small, but the enrollment it might capture would not be highly profitable. The contribution margin on Aetna's fully-insured business is approximately 18%.[63]

70. Further, the elasticity of demand by health plans for Caremark's PBM services is likely to be high based on plans' descriptions of their concerns over PBM costs, and the availability of alternative PBMs indicates that they could switch away from a high-cost PBM if needed. Consequently, the loss of PBM profits by CVS

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[61] Moresi and Salop (2013).

[62] Form E, Economists Report; Memorandum by Carl Shapiro and Steven Tenn Submitted to the Department of Justice on January 2018, Appendix D. *Hereinafter* "Shapiro/Tenn DOJ Memo Appendix D."

[63] *Id.* These calculations are based on information from Aetna's Form 10-K.

Health would likely be significant if it attempted to increase prices to Pennsylvania health plans.

71. The profitability of a vertical foreclosure strategy in PBM services thus comes down to a comparison of two factors: (a) likely small incremental profits on health plan business that Aetna would gain and (b) likely large lost profits on PBM business that CVS Health would incur. Therefore, the vGUPPIu, or the measure of the economic incentive of CVS Health to engage in input foreclosure, is small.

72. Using reasonable assumptions, the vGUPPIu's for CVS Health in Pennsylvania are between 0.4% and 0.7% for Medicare enrollment and between 0.4% and 0.6% for other types of enrollment.[64] These levels are below those which could reasonably support claims of competitive harm from input foreclosure of PBM services by CVS Health to health plans that compete with Aetna. Even in the areas in which Aetna's shares are highest, the economic incentive for CVS Health to foreclose competing health plans, based on this analytical approach, is small. Further, even if Aetna's share were to expand significantly, the vGUPPIu's would continue to be small.

73. Of course, it is possible that CVS Health could attempt to foreclose not just one competing health plan in an area, but all of those plans. No health plan market in Pennsylvania appears to be so dominated by PBM services provided by Caremark that foreclosure of multiple health plans would be problematic. Groups can choose among various health plans for insurance, and not all of those plans use Caremark for PBM services. Further, as discussed above, health plans could switch to other PBM service providers if they are dissatisfied with the price or quality of Caremark's services.

b) Analysis of Health Plan Interviews

74. Notwithstanding the empirical analysis of shares and margins, interviews with health plan representatives in Pennsylvania revealed considerable concern about health plans contracting with an integrated competitor for PBM services. While several plans indicated that they had not performed any formal analyses to quantify the impact of the transaction on their business, they nevertheless raised concerns about contracting with Optum, United Health's integrated PBM, as well as in anticipation of the CVS-Aetna and Express Scripts-Cigna transactions. This concern exists notwithstanding that Optum is currently used by or was part of the final competitive bidding for some plans.

75. As explained in some interviews, health plans fear that Caremark could give more favorable pricing and terms for PBM services to Aetna than to competing health plans. If Caremark favored Aetna (i.e., foreclosed PBM services to competing

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[64] *Id.*

plans in some fashion), this could lead to the competing health plans losing bids for customers to Aetna. Some health plans asserted that this threat exists regardless of the current low level of enrollment of the integrated health plan in the area. This perception evidently arises out of competitor health plans' belief that by disfavoring them, any integrated entity could quickly grow its own health plan enrollment.

76. Each health plan described its contract bidding or market-check process as involving more than just its incumbent PBM services provider. Some plans explained that the price received from the PBM depended on the plan's ability to pressure its top PBM services bidder with the threat to move the contract to the second-best bidder. Notwithstanding that no more than two PBM bidders were part of this final negotiation process, health plans expressed that having more than two bidders appeared favorable to negotiating the best price.

77. Regardless of the availability of sufficient PBM alternatives, some Pennsylvania health plans have expressed concern that all three large PBMs will be integrated with one of the health plans' direct competitors. While the vGUPPIu analyses indicate that incentives to foreclose are not present for CVS-Aetna, the health plans are nevertheless concerned that access to their competitively sensitive information could deliver an unfair advantage to their integrated competitors. Such concerns may be addressed with firewall provisions in contracts.

## C. Vertical Foreclosure of Retail Pharmacy Services to Competing Health Plans

78. The same general theory of vertical foreclosure for PBM services applies to retail pharmacy services. An integrated owner of a retail pharmacy network could, in theory, increase prices or restrict availability of access to retail pharmacy services to enrollees of competing health insurance plans. The integrated entity could earn higher profits from this strategy if (a) retail pharmacy services markets are insufficiently competitive, (b) at least some of the cost increase of retail pharmacy services is passed on to the competing health plan's enrollees, and (c) the integrated entity's health plan could capture enough diverted sales to make the overall strategy profitable.

### *1. Competitiveness of Retail Pharmacy Services in Pennsylvania*

79. CVS Health's retail pharmacy share of prescription revenues was 23.8% nationwide in 2017 and its share of pharmacy locations was 18% in Pennsylvania.[65] Further, CVS's share of store locations in Pennsylvania was lower than 35% in all individual counties in the Commonwealth.[66] In other

[65] Drug Channels Analysis, February 21, 2018. Available from https://www.drugchannels.net/2018/02/the-top-15-us-pharmacies-of-2017-market.html; CVS Health CONFIDENTIAL HSR Information submitted to the DOJ.
[66] CVS Health CONFIDENTIAL HSR Information submitted to the DOJ.

words, in every Pennsylvania county, there were at least two pharmacies unaffiliated with CVS Health for every CVS pharmacy location. In addition to CVS, providers of retail pharmacy services in Pennsylvania include drug-store chains like Rite Aid and Walgreens, both of which compete head-to-head with CVS in all or parts of the state. Other providers whose pharmacies can be part of retail networks include grocery stores like Giant Eagle and Weiss Markets, big box stores like WalMart, and independent pharmacies. There are 1.8 times as many independent pharmacies in Pennsylvania as CVS pharmacies.[67] Independent pharmacies are commonly contracted through affiliated groups such as, McKesson's Health Mart Atlas, AmerisourceBergen's Elevate Provider Network, and Arete Pharmacy Network.[68] Subsets of these providers are widely available in many communities in Pennsylvania.

80. The competitiveness of retail pharmacy services is reinforced by the same bidding process that is used for PBM services. The bidding process does not require a large number of bidding pharmacy network providers to reach a competitive outcome. If a PBM does not own a retail network, it contracts with pharmacies to establish a sufficient network for its health plan customers.

81. Industry trends point to the increasing popularity of preferred or narrow retail pharmacy networks and this dynamic creates competitive pricing pressures for pharmacy chains that wish to be included in preferred tiers.[69] Virtually all Medicare prescription drug plans included preferred networks in 2018 while only 7% of plans did so in 2011.[70] The pace of implementation of preferred and narrow plans appears to be accelerating within commercial health insurance plans as well. In 2016, half of employer-sponsored plans offered preferred or limited retail pharmacy networks, up from 31% in 2013.[71]

82. Some of the Pennsylvania health insurers noted that their customers have a strong preference for broad networks, or networks that include CVS pharmacies, for which customers would be willing to pay higher premiums. For these health plans, an inability to offer products that include CVS pharmacies could diminish their competitiveness relative to Aetna and other plans with broader networks.

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[67] *Id.*

[68] *See* "McKesson Launches Health Mart Atlas." Press Release, April 05, 2018. Available from https://www.mckesson.com/about-mckesson/newsroom/press-releases/2018/mckesson-launches-health-mart-atlas. *See also*, Adam Fein, "How Independent Pharmacies Will Participate (Or Not) in 2018's Part D Preferred Pharmacy Networks," Drug Channels, October 26, 2017. Available from https://www.drugchannels.net/2017/10/how-independent-pharmacies-will.html.

[69] McKesson Analysis, August 20, 2018. Available from https://www.mckesson.com/blog/retail-pharmacy-trends-to-watch.

[70] Adam Fein, "Exclusive: Preferred Pharmacy Networks Will Dominate 2018 Medicare Part D Plans (Plus: We Review the Top Plan Sponsors)." Drug Channels, October 17, 2017. Available from https://www.drugchannels.net/2017/10/exclusive-preferred-pharmacy-networks.html.

[71] Adam Fein, "Yes, Commercial Payers Are Adopting Narrow Retail Pharmacy Networks)." Drug Channels, January 11, 2017. Available from https://www.drugchannels.net/2017/01/yes-commercial-payers-are-adopting.html.

These health plans may nevertheless have an ability to protect themselves from attempted foreclosure of retail pharmacy services by offering both broad and narrower network products alongside each other. An ability to deny or threaten to deny the integrated CVS Health some portion of their enrollee volume subsequent to an attempted price increase provides health plans with a mechanism to protect themselves against foreclosure.

83. Even if the alternative retail pharmacies available in Pennsylvania were insufficient to protect health plans from vertical foreclosure and above-competitive pricing from CVS, competitive discipline can prevail through other market mechanisms. Specifically, health plans can and currently do rely on national or regional contracts between PBMs and CVS, which obscures the health plan's identity to the retail pharmacy services provider. As a result, an integrated supplier of retail pharmacy services could not target one specific Aetna competitor for foreclosure. To do so would risk losing contracts in areas in which Aetna's presence is too limited to ensure sufficient capture of enrollees leaving foreclosed competitor health plans.

84. Some health plans may have "pass-through" contracts with pharmacy and network service providers that contract directly with CVS for retail pharmacy services on behalf of the individual plan. When such contracts are in place, CVS Health would know the identity of the health plan, possibly making it better able to increase prices for retail pharmacy services to that plan without risking the loss of sales it has with other health plans. Such an ability might arise if most of the health plan's enrollees desire broad networks. Health plans could, however, protect themselves from this type of attempted foreclosure by switching away from a pass-through model to the more traditional model of relying on the PBM's national contract.

### *2. Ability of Aetna to Capture Sufficient Sales from its Health Plan Competitors to Offset Lost Profits by CVS Health in Retail Pharmacy Services Due to Vertical Foreclosure*

85. Notwithstanding indications that the retail pharmacy services market is actually competitive, we have conducted an analysis of CVS Health's foreclosure incentives involving retail pharmacy services. The same analysis of health plan shares conducted for the PBM foreclosure discussion above applies to foreclosure of retail pharmacy services. Again, it is a balance of CVS Health profits gained from capture of health plan enrollees leaving other plans against foregone profits from losing health plan customers of its retail pharmacies.

*i. The Profitability of Sales Diverted to Aetna*

a) Empirical Analysis

86. The likelihood of Aetna capturing sales of health plan accounts diverted from competing health plans is modeled by the diversion analysis discussed above. Another relevant consideration pertains to lost foot-traffic and front-of-store sales, which provide disincentives to foreclosure attempts through the sale of retail pharmacy services. Insofar as vertical foreclosure of CVS pharmacies reduces sales of profitable non-prescription drug items that are purchased along with prescription drugs, the higher lost profits per prescription drug sale are that much more difficult to offset by increased enrollment in Aetna products.

87. Share-based diversion ratios from competing plans to Aetna are between 16.5% and 21.1% for Medicare enrollment and between 14.1% and 23.3% for all other enrollment. These diversion rates indicate that there is only a small economic incentive to CVS Health to foreclose its retail pharmacy network from competing health plans.

b) Analysis of Health Plan Interviews

88. Health plans described CVS Health as an important supplier of retail pharmacy services, explaining that it would be very disruptive for customers if CVS retail pharmacies were dropped from their current pharmacy networks.[72] As discussed above, however, industry trends appear to indicate that it is increasingly feasible for health plans to offer preferred or limited networks that exclude CVS retail pharmacies, at least for some portion of their enrollees. Some plans indicated that restricted retail pharmacy networks without CVS pharmacies could be marketed in narrow-network products by using some combination of Walgreens, Rite Aid, independent pharmacies, grocery stores, and big box stores. But others were skeptical of the acceptability of those networks.[73]

89. If enrollees left a health plan because of dissatisfaction related to CVS pharmacies not being in-network, those enrollees are more likely to change to Aetna or other plans where access to CVS pharmacies would be assured.[74] To the extent CVS is a "must-have" provider for some portion of a health plan's retail pharmacy network, and the integrated entity can successfully target that health plan, the transaction potentially creates an incentive for CVS Health to foreclose the health plan. Since at least two of every three pharmacies in each county are unaffiliated,

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[72] Interviews of Pennsylvania health plans.

[73] *Id.*

[74] It is unlikely that CVS Health's retail pharmacy business can be sustained based on Aetna enrollees alone, and hence CVS Health would be unable to foreclose all competitor health plans from access to its retail pharmacies. Rather. CVS Health might attempt foreclosure by raising the price to access its retail pharmacy network. If so. health plans could respond by shifting at least part of their enrollee volume to competing networks, thereby rendering the price increase unprofitable.

CVS Health's retail network of pharmacies can only be a "must-have" if enrollees have a strong preference for CVS despite the availability of other alternatives. At least some Pennsylvania health plans perceive that such preferences do exist. Such concerns may warrant certain actions by the PID to ensure that the markets for retail pharmacy services remain competitive.

## D. Vertical Foreclosure of Immediate Care Services to Competing Health Plans

90. An equivalent theory of vertical foreclosure applies to immediate care services, such as those provided in CVS MinuteClinics. An ability to foreclose health plan rivals through higher prices for MinuteClinic services hinges critically on the competitiveness of the market within which immediate care services are offered. Due to low entry barriers for the provision of such services, and substitutability with urgent care, primary care and other types of providers, it is unlikely that the market lacks sufficient competition. Further, CVS Health only had 34 MinuteClinic locations across 32 Pennsylvania cities in 2018.[75] In contrast, there were 281 urgent care centers in the Commonwealth in 2018.[76] These facts indicate that immediate care services presently are offered in competitive markets and that an integrated CVS Health would not have an ability to foreclose Aetna's rivals by raising its prices for MinuteClinics.

91. Separately health plans did not raise concerns that an integrated CVS Health would have an ability to foreclose them by increasing their prices for MinuteClinic services. Nevertheless, certain actions by the PID could be warranted to ensure that the markets in which immediate care services are offered remain competitive.

## E. Entrenched Concentration in the PBM Services Market

92. A theory can be advanced that the PBM services market is currently highly concentrated with prices above competitive levels and that but-for the transaction, Aetna might enter the PBM services market or provide its enrollment volume as a critical element of another entity's planned entry into the PBM services market. Under this theory, allowing the CVS-Aetna transaction would entrench presently high market concentration and reduce the opportunity to have lower prices through new entry.

93. As was discussed above, there is little, if any, evidence that prices in the PBM services market are above-competitive, notwithstanding the market structure. Rather, the bidding process of PBM service providers to win contracts with health

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[75] *See* https://www.cvs.com/minuteclinic/clinics/Pennsylvania.

[76] Laurel Stoimenoff and Nate Newman (2018) "Urgent Care Industry White Paper 2018." Urgent Care Association, p. 4. Available from https://www.ucaoa.org/news/385778/Industry-White-Paper-Forecasts-Patient-Centric-Healthcare-Diversification-of-Services.htm.

plans does not require large numbers of sellers to result in competitive prices and quality. Some of the Pennsylvania health plans provided evidence that they have used the second-best PBM services bid to create competitive pressure on the top bidder without regard to any other bids.

94. Moreover, CVS and Aetna do not overlap as suppliers of PBM services to other health plans, so the transaction will not increase concentration in the PBM services market. Further, no evidence has arisen that Aetna is a likely potential entrant into PBM services or that its enrollment is a critical element of any other entity's planned entry into the PBM services market. To the extent Aetna were a likely entrant, other insurers such as Humana or coalitions of provider-led plans would remain as potential entrants as well.

95. Even if Aetna were to enter the PBM services market as a provider to non-integrated health plans, however, any foreclosure incentives that potentially apply to the integrated CVS Health would apply to the integrated Aetna PBM as well. Thus, Aetna as a new entrant would have largely the same economic incentives as the integrated CVS Health entity.

96. Insofar as integration between CVS and Aetna creates efficiencies that lower costs to enrollees, consumers benefit. Those efficiencies may make it more difficult for a potential entrant to effectuate entry, but to deny those cost-reducing efficiencies would harm consumers. If vertical integration creates economic efficiencies, competition among providers will compel them all to either integrate or otherwise differentiate themselves by offering some other value-added dimension to their service.

97. Optum, and possibly Express Scripts in the near future, are integrated between pharmacy and network services and health plan services, so CVS Health would have two comparable integrated competitors for PBM services. The same degree of integration does not currently exist between health plans and retail pharmacies. If significant efficiencies are created by that integration, more integrated health plans and retail pharmacy chains will be likely to merge. In the meantime, several non-integrated pharmacy providers are available for health plan retail pharmacy networks.

## VII. CONCLUSION

98. Based on our overall evaluation of the available quantitative information related to the sale of PBM, retail pharmacy, and immediate care services in Pennsylvania, we conclude that the CVS Health-Aetna transaction is unlikely to result in harm to competition in any markets. The qualitative information that we gathered from our interviews with Pennsylvania health plans that purchase of PBM, retail pharmacy and immediate care services is not entirely consistent with the empirical analysis. The health plans expressed concerns that the integration of CVS Health and Aetna would affect their ability to receive competitive bids for

PBM, retail pharmacy and/or immediate care services. Furthermore, competitive conditions for each of these services can vary by geographic area within Pennsylvania, among certain types of customers, and over time. Consequently, the PID may choose to take certain actions to ensure that CVS Health deals with Aetna's rivals on competitive terms and that it does not otherwise harm competition.

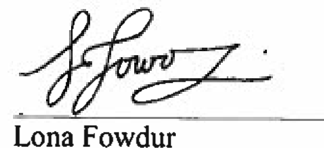
99. We conclude that horizontal competition between CVS Health and Aetna, which is limited to Medicare prescription drug programs, is unlikely to be harmed because CVS Health plans to divest the stand-alone PDP business of Aetna. If it were the case that a combined PDP/MAPD market were properly defined, it would result in combined shares of CVS Health and Aetna exceeding the thresholds of a prima facia competitively harmful transaction as defined in the Pennsylvania statutes. Because there are a number of similar competitors to Aetna that do not face barriers to expansion, even if PDP/MAPD were a properly defined market, we believe that competition is unlikely to be harmed as a result of a CVS Health-Aetna transaction.

100. Various theories exist that an integrated CVS Health-Aetna would have an economic incentive to deal with Aetna's health plan competitors in ways that disadvantage those health plans in competing with Aetna, potentially resulting in vertical harm to competition. Our empirical analysis shows that it is unlikely such vertical competitive harm would occur. The economic gain in health plan markets that CVS Health might achieve from such an attempt would likely be too small to offset the economic loss that strategy would incur in its PBM, retail pharmacy, and immediate care businesses.

101. Some of the qualitative evidence supplied by Pennsylvania health plans indicated the plans' concerns that an integrated CVS Health-Aetna would undermine the plans' ability to receive competitive bids for PBM, retail pharmacy and immediate care services. While it is possible that specific plans or large employers with particular needs could be adversely affected, it is not clear that such conditions exist in the Commonwealth.

102. Theories that competition in PBM services markets would be harmed by the transaction thwarting Aetna's entry in PBM services or otherwise harmfully raising entry costs to PBM services are not supported by the evidence.

David Argue



Lona Fowdur

# Exhibit 1

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Senior Vice President, Economists Incorporated
January 2001 – December 2002.

Vice President, Economists Incorporated
January 2000 – December 2000.

Senior Economist, Economists Incorporated
August 1990 – December 1999.

**Testimony**

Trial testimony, deposition and expert report on behalf of respondent Otto Bock in *FTC v. Otto Bock HealthCare* (FTC Docket No. 9378), June 2018, September 2018.

Deposition and expert report on behalf of plaintiff in *Air Evac EMS, Inc. v. State of Texas, Ex Rel. Department of Insurance and Texas Mutual Insurance Company, et al.* (CA No. 1:16-cv-00060-SS, U.S. District Court, Western District of Texas, Austin Division), March 2018.

Hearing testimony on behalf of respondent Ascension Wisconsin in *Marshfield Clinic Conditional Use Permit Application* (Oneida County, Wisconsin, Planning & Development Committee), April and December 2017.

Deposition and expert report on behalf of plaintiff in *The Nemours Foundation v. Unison Health Plan of Delaware* (CA No. 1:15-CV-00319-RGA, U.S. District Court for the District of Delaware), September 2016.

Arbitration hearing testimony, deposition and expert report on behalf of claimants in *Sutter Health v. California Physicians Service dba Blue Shield of California* (No. 1130006105, JAMS Arbitration), May and June 2016.

Hearing testimony on behalf of applicant *In the Matter of: Maricopa Ambulance, Applicant* (No. 2015A-EMS-0190-DHS, Office of Administrative Hearings, Maricopa County, Arizona), October 2015.

Deposition and expert report on behalf of defendant in *Advanced Chiropractic and Health Center, et al. v. Health Network Solutions* (No. 13-CVS-2595, State of North Carolina, County of Forsyth, General Court of Justice, Superior Court Division), July 2015.

Expert report on behalf of defendant in *32nd Street Surgery Center v. HMO Missouri* (No. 12-05134-CV-SW-GAF, U.S. District Court for the Western District of Missouri), October 2014.

Deposition and expert report on behalf of defendants in *Kissing Camels Surgery Center, et al. v. Centura Health Corporation* (No. 1:12-CV-03012-WJM-BNB, U.S. District Court for the District of Colorado), July 2014.

Deposition and expert report on behalf of defendants in *Medical Center at Elizabeth Place v. Premier Health Partners* (No. 3:12-CV-00026, U.S. District Court for the Southern District of Ohio, Western Division), June 2014.

**Testimony (continued)**

Deposition (30(b)(6)) on behalf of defendant in *Pacific Radiation Oncology v. The Queen's Medical Center* (No. 12-00064 LEK-KSC, U.S. District Court for the District of Hawaii), May 2014.

Deposition, expert report and Daubert hearing testimony on behalf of defendant in *Monroe Surgical Hospital v. St. Francis Medical Center* (No. 06-1700, Louisiana Fourth Judicial District Court, Parish of Ouachita), April and October 2014.

Trial testimony, deposition and expert reports on behalf of defendant in *Saint Alphonsus Medical Center, et al. and Federal Trade Commission, et al. v. St. Luke's Health System* (No. 1:12-CV-00560-BLW, U.S. District Court in the District of Idaho), December 2012, October 2013.

Deposition and expert report on behalf of defendant in *State of California, ex rel. Rockville Recovery v. Sutter Health* (No. 34-2010-00079432, Superior Court of California, County of Sacramento), August 2013.

Expert report on behalf of defendant in *J. Randall Rauh, M.D. v. Holy Rosary Healthcare* (No. DV-2011-41, Montana Sixteenth Judicial Court, Custer County), November 2012.

Affidavit on behalf of defendant in *Rodney Posey, D.O. v. Tupelo Anesthesiology Group* (No. 3:11-CV-49-MPM-SAA, U.S. District Court for the Northern District of Mississippi, Western Division), January 2012.

Trial testimony and expert report on behalf of defendant in *Iacangelo v. Georgetown University Hospital, et al.* (No.1:05-CV-02086, U.S. District Court for the District of Columbia), January 2011.

Deposition and expert report on behalf of defendants in *Wood v. Archbold Medical Center, et al.* (No. 7:07-CV-00109-WLS, U.S. District Court for the Middle District of Georgia, Valdosta Division), February 2009.

Deposition and expert report on behalf of defendants in *Omnicare, Inc. v. United Health Group, PacifiCare Health Systems, Inc. et al.* (No. 1:06-CV-06235, U.S. District Court for the Northern District of Illinois, Eastern Division), June 2008.

Testimony before Utah State Legislature, Task Force on Privately Owned Health Care Organizations regarding report entitled, "Competition in Utah Health Care Markets," May and June 2006.

**Testimony (continued)**

Deposition and affidavit on behalf of defendants in *Philip D'Arrigo v. South Jersey Hospital System, et al.* (C-34-99, Superior Court of New Jersey, Chancery Division, Cumberland County), June 2006.

Affidavit on behalf of defendants in *Nadler v. Aspen Valley Hospital, et al.* (No. 99-RB-1763 (MJW), U.S. District Court for the District of Colorado), May 2005.

Deposition and affidavit on behalf of defendants in *Ayodeji O. Bakare, M.D. v. PinnacleHealth Hospitals, et al.* (C.A. No. 1: CV-03-1098, U.S. District Court for the Middle District of Pennsylvania), June 2005.

Affidavit in *Arbitration Between the City of Hallandale Beach and Reuter Recycling.* (American Arbitration Association Hearing, No. 3218100758-02), September 2004.

Trial testimony on behalf of plaintiff in *Geisinger Clinic v. Bernard C. Adukaitis, D.O.* (No. S-725-2003, Court of Common Pleas of Schuylkill County, Pennsylvania), June 2003.

Deposition and affidavit on behalf of defendants in *Grand Valley Health Plan, et al. v. Gambro Health Care of Michigan, et al.* (No. 1:00-CV-873, U.S. District Court for the Western District of Michigan), March 2002.

Affidavit on behalf of defendants in *Terrence E. Babb., M.D. v. Penn State Geisinger Health System, et al.* (No. 4: CV99-1951, U.S. District Court for the Middle District of Pennsylvania), January 2001.

Affidavit on behalf of defendant in *J.F. Energy Corporation v. Carlos R. Leffler, Inc., et al.* (No. 98CV-5219, U.S. District Court for the Eastern District of Pennsylvania), October 2000.

Affidavit on behalf of plaintiff in *In Re: Graham-Field Health Products, Inc.* (No. 99-4457(MFW), United States Bankruptcy Court for the District of Delaware), July 2000.

Deposition and affidavit on behalf of defendants in *Methodist Hospitals of Dallas v. Physicians Reliance Network, et al.* (No. 96-01253, District Court of Dallas County, Texas, 44th Judicial District), March 1998.

Deposition in Certificate of Need hearing for Big Cypress Medical Center. (No. 96-1020, State of Florida, Division of Administrative Hearings), January 1997.

**Testimony (continued)**

Affidavit submitted to U.S. Department of Justice during Hart-Scott-Rodino review of Owensboro-Daviess County Hospital/Mercy Hospital consolidation, June 1995.

**Selected Matters**

*Western Connecticut Health System Merger with HealthQuest*. Hart-Scott-Rodino review of hospital transaction in western Connecticut and eastern New York.

*Southern New Hampshire Health System Merger with Elliot Health System*. Hart-Scott-Rodino review of hospital transaction in southern New Hampshire.

*IU Health Acquisition of Premier Healthcare*. Analysis of competition in physician services markets in southern Indiana.

*Emory University Health Acquisition of DeKalb Medical*. Hart-Scott-Rodino review of hospital transaction in suburban Atlanta.

*Greenville Health System Merger with Palmetto Health*. Hart-Scott-Rodino review of hospital transaction in central South Carolina.

*St. Luke's University Health System Acquisition of Sacred Heart Hospital*. Hart-Scott-Rodino review of hospital transaction in eastern Pennsylvania.

*Air Evac v. Medical Mutual of Ohio*. Expert report on behalf of plaintiff regarding appropriate payment rates for out-of-network air ambulance services.

*University Health Services-Trinity Hospital Acquisition*. Hart-Scott-Rodino review of hospital and physician transaction in Augusta, Georgia.

*Anthem-Cigna Health Insurance Transaction*. Analysis of market definition and competitive effects; submission of expert reports to state insurance regulators.

*Massachusetts General Hospital Acquisition of Wentworth-Douglass Hospital*. Hart-Scott-Rodino review of hospital transaction in New Hampshire.

*Fairview Health System Acquisition of Health East*. Hart-Scott-Rodino review of hospital and physician transaction in Minneapolis.

*St. Francis Health System Acquisition of Eastar Health System*. FTC review of hospital and physician transaction in eastern Oklahoma.

**Selected Matters (continued)**

*Lehigh Valley Health Network Acquisition of Pocono Medical Center.* FTC and Attorney General review of hospital transaction in eastern Pennsylvania.

*Lehigh Valley Health Network Acquisition of Schuylkill Medical Center.* Attorney General review of hospital transaction in central Pennsylvania.

*UPMC Acquisition of Jameson Hospital.* Attorney General review of hospital transaction in western Pennsylvania.

*Fairview Health System Proposed Acquisition of University of Minnesota Physicians.* FTC review of multi-specialty physician services transaction in Minneapolis.

*Hershey Medical Center-Pinnacle Health Merger.* Hart-Scott-Rodino review of proposed hospital transaction in central Pennsylvania.

*Northwestern Health Acquisition of KishHealth.* Hart-Scott-Rodino review of hospital transaction in suburban Chicago.

*BJC Health System Acquisition of Memorial Hospital Belleville.* Hart-Scott-Rodino review of hospital and physician transaction in St. Louis.

*BJC Health System Acquisition of Mineral Area Regional Medical Center.* FTC review of hospital transaction in southeastern Missouri.

*University of Michigan Health System Proposed Acquisition of Allegiance Health.* Hart-Scott-Rodino review of hospital transaction in southern Michigan.

*Community Health System Acquisition of Sharon Regional Hospital.* Hart-Scott-Rodino review of hospital transaction in western Pennsylvania.

*University Hospitals Acquisition of Parma Community General Hospital and EMH Healthcare.* Hart-Scott-Rodino review of hospital transactions in the Cleveland area.

*WellSpan Health System Acquisition of Ephrata Community Hospital.* Hart-Scott-Rodino review of hospital transaction in central Pennsylvania.

*Montefiore Medical Center Acquisition of Sound Shore Health System.* Hart-Scott-Rodino review of hospital transaction in New York City area.

*Geisinger Health System Acquisition of Lewistown Hospital.* Hart-Scott-Rodino review of hospital and physician transaction in central Pennsylvania.

**Selected Matters (continued)**

*Dartmouth-Hitchcock Economic Impact Study.* Study of the impact of Dartmouth-Hitchcock Health System on the economy of the State of New Hampshire.

*Lehigh Valley Health Network – St. Luke's University Health Network Hospice Merger.* FTC review of merger of hospice operations in eastern Pennsylvania.

*Lehigh Valley Health Network Acquisition of Greater Hazelton Health Alliance.* Hart-Scott-Rodino review of hospital transaction in eastern Pennsylvania.

*UPMC Acquisition of Altoona Regional Health System.* Hart-Scott-Rodino review of hospital transaction in Altoona, PA.

*Western Connecticut Health System Acquisition of Norwalk Health.* Hart-Scott-Rodino review of hospital transaction in western Connecticut.

*Mt. Sinai Medical Center Acquisition of Continuum Health Partners.* Hart-Scott-Rodino review of hospital transaction in New York, NY.

*Cone Health Acquisition of Alamance Regional Medical Center.* Hart-Scott-Rodino review of hospital and physician transaction in Greensboro-Burlington, NC.

*Care New England Acquisition of Memorial Hospital.* Hart-Scott-Rodino review of hospital transaction in Providence, RI.

*HealthPartners, Park Nicollet Affiliation.* Hart-Scott-Rodino review of hospital and physician transaction in Minneapolis–St. Paul.

*Sutter Health v. Kaiser Health System.* Analysis for plaintiff of hospital and physician markets in northern California in dispute over health plan payment rates.

*MultiCare Health System Acquisition of Auburn Regional Medical Center.* Hart-Scott-Rodino review of hospital transaction in suburban Tacoma, Washington.

*Proposed Consolidation of NYU Langone Medical Center and Continuum Health Partners.* Competition analysis of aborted hospital transaction in New York City.

*Proposed Acquisition of PharMerica by Omnicare.* Hart-Scott-Rodino review of proposed merger of institutional pharmacy providers.

*Gessner v. Memorial Hospital, et al.* Statistical analysis for defendant in tortious interference claim regarding referrals from hospital emergency room.

**Selected Matters (continued)**

*Community Health Services Acquisition of Moses Taylor Hospital.* Hart-Scott-Rodino review of hospital transaction in Scranton, PA.

*Stellaris Health Network Proposed Acquisition of Hudson Valley Hospital Center.* Hart-Scott-Rodino review of proposed hospital transaction in Westchester County, NY.

*Investigation by Department of Justice of UPMC and Highmark.* Analysis on behalf of UPMC of antitrust economic issues related to market structure, contracting behavior and vertical relationships.

*Northeast Health, St. Peters, Seton Hospital Merger.* Hart-Scott-Rodino review of hospital transaction in Albany, NY.

*Glynne v. Wilmed Healthcare.* Analysis of antitrust allegations for defendants in ob/gyn services litigation.

*Radiology Consultants v. Washoe Health System.* Liability and damages analyses for defendants in monopolization and tying claim.

*Clarian Health Partners Merger with Bloomington Hospital.* Hart-Scott-Rodino review of hospital transaction in central Indiana.

*Banner Health Acquisition of Sun Health.* Hart-Scott-Rodino review of hospital transaction in Phoenix, Arizona.

*St. Elizabeth Medical Center Acquisition of St. Luke Hospitals.* Hart-Scott-Rodino review of hospital transaction in the Kentucky suburbs of Cincinnati, Ohio.

*Patel v. Verde Valley Medical Center, et al.* Analysis of monopolization and tying claims in cardiology services on behalf of defendants.

*UPMC Acquisition of Mercy Hospital.* Hart-Scott-Rodino and Pennsylvania Attorney General review of hospital transaction in Pittsburgh, Pennsylvania.

*Ochsner Health System Acquisition of Tenet Healthcare Hospitals.* Hart-Scott Rodino review of hospital transaction in New Orleans, Louisiana.

*Arizona Nursing Services Investigation and Litigation.* Economic analysis on behalf of defendants in government investigation and private litigation of alleged monopsony purchasing of temporary nursing services.

**Selected Matters (continued)**

*Pym v. Einstein Practice Plan.* Damages report in arbitration hearing on behalf of defendant.

*Geisinger Health System Acquisition of Mercy Hospital of Wilkes-Barre.* Market and competition analysis for merging parties before Pennsylvania Attorney General.

*Federal Trade Commission Investigation of Pediatrix Medical Group.* Analyses of market structures, pricing, etc. for retrospective merger review in neonatology services.

*Investigation by Department of Justice of Anthem Health Plan of Indiana.* Analysis on behalf of Anthem of market conditions and impact of MFN agreements.

*Blume v. Marian Health Center, et al.* Analysis of antitrust allegations in pain management services for defendant hospital.

*Cemex/RMC Acquisition.* Hart-Scott-Rodino review of cement, ready mix and block products transaction.

*Havasu Surgery Center v. Havasu Regional Medical Center.* Damages analysis for defendants in case of alleged interference with business expectancy.

*Metropolitan Medical Services of NC v. Draegerwerk AG.* Damages analysis for plaintiff service organizations of anesthesia equipment.

*Valley Baptist Medical Center Acquisition of Brownsville Medical Center.* Hart-Scott-Rodino and Texas Attorney General review of hospital transaction in Brownsville, Texas.

*Altoona Hospital Affiliation with Bon Secours Holy Family Hospital.* Financial and competition analysis for antitrust review of hospital transaction.

*Fisher Scientific Acquisition of Apogent Technologies.* Hart-Scott-Rodino review of clinical and research laboratory products acquisition.

*First American/Transamerica Transaction.* Hart-Scott-Rodino review of real estate property tax and flood insurance services acquisition.

*Tenet Healthcare Proposed Acquisition of Slidell Memorial Hospital.* Competition analysis of hospital transaction in Slidell, Louisiana.

**Selected Matters (continued)**

*Anderson v. Washington Post.* Damages analysis for defendant in employment discrimination case.

*American Chiropractic Association v. Trigon Healthcare.* Analysis of restraint of trade allegations in chiropractic services on behalf of defendants.

*Ardent Health System Acquisition of Lovelace Health System.* State insurance department review of hospital and health insurance plan acquisition.

*CIGP v. Banner Health System.* Analysis for defendant of monopolization and restraint of trade in cardiac catheterization services.

*HealthAmerica v. Susquehanna Health System.* Competition analysis for defendant hospitals in monopolization claim.

*Robinson v. The Detroit News.* Damages analysis for defendant in sex discrimination matter.

*HCA Acquisition of HealthSouth Medical Center.* Hart-Scott-Rodino review of hospital transaction in Richmond, Virginia.

*Tenet Healthcare Acquisition of Daniel Freeman Hospitals.* Hart-Scott-*Rodino* review of hospital acquisition in Los Angeles, California.

*Tenet Healthcare Acquisition of Intracoastal Health System.* Hart-Scott-Rodino review of hospital merger in Palm Beach County, Florida.

*Gordon v. Lewistown Hospital.* Analysis for defendant of restraint of trade and tying claims of ophthalmologist.

*St. Luke's Hospital v. California Pacific Medical Center.* Competition analysis for defendant hospital of tying claim.

*Continental Orthopedic Appliances v. Health Insurance Plan of Greater New York.* Analysis of competition for defendants in orthotics and prosthetics industry monopolization claim.

*Lincoln Electric Acquisition of Charter, PLC.* Hart-Scott-Rodino review of competition in welding products industry.

*State of Michigan v. Gambro Healthcare.* Competition analysis for defendants in renal dialysis monopolization claim.

**Selected Matters (continued)**

*ZC Sterling v. Nations Data.* Damages analysis for plaintiff in theft of trade secrets claim in real estate tax outsourcing business.

*Ahold/Pathmark Proposed Acquisition.* Hart-Scott-Rodino review of competition related to grocery store chain acquisition.

*Cunico and Curran v. New Mexico Blue Cross and Blue Shield.* Analysis of plaintiff chiropractors' allegations of restraint of trade.

*Bender v. Suburban Hospital.* Damages analysis for defendant in matter of physician's loss of privileges.

*Bizzle v. Northern Montana Hospital.* Analysis for defendants of orthopedic surgeon's claim of monopolization.

*Kressel v. Gannett Co.* Damages analysis for defendant in age discrimination matter.

*Greenkeepers v. Softspikes.* Competitive analysis for defendants of foreclosure claim in plastic golf cleats industry.

*Sisters of Charity/Columbia-HCA Acquisition.* Antitrust analysis and efficiency study in Hart-Scott-Rodino review of hospital merger in Beaumont, Texas.

*Forest Protection Ltd. v. Bayer AG, et al.* Cost-based damages model for defendant pesticide manufacturers in price-fixing litigation.

*Topper v. Paik, et al.* Damages analysis of lost income and profits from delay of hospital transaction.

*Burlington Drug v. VHA.* Analysis of competition for defendant group purchasing organization in monopolization and foreclosure claim.

*Lutheran Health System/Samaritan Health Merger.* Hart-Scott-Rodino review of competition for merger of Phoenix, Arizona hospital systems.

*Sisters of Charity/Wadley Memorial Acquisition.* Competitive analysis and efficiency study for Hart-Scott-Rodino review of hospital acquisition in Texarkana, Texas.

*FTC v. Tenet Healthcare.* Analysis and litigation support on behalf of merging hospitals in Poplar Bluff, Missouri.

**Selected Matters (continued)**

*Sentara Healthcare/Tidewater Healthcare Consolidation.* Antitrust analysis and efficiency study in Hart-Scott-Rodino review of hospital merger.

*Nebraska Physician Merger.* Review and analysis of competitive effects of physician group merger.

*Iowa Eye v. Noyes.* Competition and damages analysis for defendant ophthalmologists and optometrists in a restraint of trade claim.

*Timberlawn Psychiatric Hospital v. Tenet Healthcare.* Analysis for defendants of attempted monopolization claim.

*CIGNA/Healthsource Acquisition.* Hart-Scott-Rodino review of health insurance plan merger.

*Angelico v. Lehigh Valley Hospital.* Competitive analysis for defendants in restraint of trade claim for cardiac surgery services.

*Brader v. Allegheny General Hospital.* Damages analysis for vascular surgeon in breach of contract matter.

*Freedman v. Flagler Hospital.* Analysis for defendant of monopolization claim by obstetrician.

*Maine Medical Center/Blue Cross-Blue Shield Joint Venture.* Competitive analysis of health insurance product joint venture.

*Polyfibron Technologies/Lee Industries Acquisition.* Hart-Scott-Rodino review of printing plates merger.

*Hager v. Venice Hospital, et al.* Analysis for defendants of monopolization claims regarding exclusive radiology contract.

*Mussallem v. Flagler Hospital, et al.* Competitive analysis for defendants of closure of birthing home.

*Delaware Health Care v. Medical Center of Delaware.* Analysis for defendants of restraint of trade claims in home health care services.

*Dench v. Centre Community Hospital.* Competitive analysis of monopolization claims regarding exclusive anesthesiology contract for defendants.

**Selected Matters (continued)**

*Conemaugh/Good Samaritan Hospital Merger.* Analysis and presentation regarding hospital costs as part of Federal Trade Commission Hart-Scott-Rodino review of hospital merger.

*Ambulance Service Contract.* Analysis for defendant of plaintiff's antitrust claims in emergency ambulance service contracting and provision.

*Columbia HCA/University Medical Center Jacksonville Joint Venture.* Department of Justice Hart-Scott-Rodino review of hospital merger.

*Zelman v. Brighton Medical Center, et al.* Analysis of obstetrician's monopolization and restraint of trade claims for defendant hospitals.

*U.S. Sound Recording Industry.* Economic assessment of U.S. sound recording industry for trade association.

*Hospital-Physician Group Acquisition.* Federal Trade Commission review of acquisition of physician groups by Fletcher-Allen Health Care Center.

*Prime Time Access Rule.* Comments to Federal Communications Commission on behalf of ABC, CBS and NBC regarding elimination of Rule.

*Natural Resource Damages.* Critical review of trustee's valuation and calculation of alternative valuation of lost recreational use of beach and boating areas due to oil spill.

*Siegel v. Psychiatric Associates.* Analysis of psychiatrist's restraint of trade and monopolization claims for defendants.

*U.S. v. Mercy Health Services and Finley Tri-States Health Group.* Work on behalf of defendants in support of hospital merger.

*GenCare Health System/United Health Care Acquisition.* Department of Justice Hart-Scott-Rodino review of health insurer merger.

*Mathews v. Lancaster General Hospital, et al.* Analysis on behalf of defendants of orthopedist's restraint of trade claims.

*Oil Spill.* Calculated loss of value to commercial property contaminated by an oil spill.

**Selected Matters (continued)**

*Northeast Health Systems/Cape Anne Health System Merger.* Department of Justice Hart-Scott-Rodino review and Commonwealth of Massachusetts review of hospital merger.

*Swarthmore Radiation Oncology v. Riddle Memorial Hospital, et al.* Analysis of group boycott claims on behalf of defendants.

*Lang v. Lehigh Valley Hospital Center, et al.* Work for hospital analyzing obstetrician's restraint of trade claims.

*Home Health Specialists v. Liberty Health System.* Analysis for defendants of monopolization and boycott claims in-home health care.

*PanAmSat v. Comsat.* Calculation of plaintiff's damages from loss and delay of satellite business.

*Eaton/Westinghouse Acquisition.* Market share analysis of industrial controls and distribution equipment for parties in Hart-Scott-Rodino review by Department of Justice.

*Bristol Steel and Iron Works v. Bethlehem Steel Corporation.* Analysis of price discrimination and monopolization claims on behalf of Bethlehem.

*Friedman v. Delaware County Memorial Hospital.* Analysis for defendant of pulmonologist's claim of restraint of trade.

*Pittsburgh Newspaper Merger.* Hart-Scott-Rodino review by Department of Justice. Involved presentation on behalf of merging parties to Department staff.

*Farr v. Healtheast Corporation, et al.* Analysis of obstetrician's claim of restraint of trade and attempted monopolization on behalf of defendant.

*Sacramento River Chemical Spill.* Analysis on behalf of defendant of economic aspects of class certification claims.

*Exxon Valdez Oil Spill.* Calculation of what seafood prices in Alaska would have been without the oil spill.

*Crystal Chemical Hazardous Waste Site Cleanup.* Analysis of competitive effects of government regulations on cleanup of hazardous waste site.

## Professional Experience

*Economist*, Center for Public Service. Charlottesville, Virginia. (1987, 1989-1990).

*Head Teaching Assistant*, University of Virginia. (1988-1989).

*Instructor*, University of Virginia. Introductory economics course. (Summer 1988).

*Teaching Assistant*, University of Virginia. (1986-1987).

*Research Assistant*, Dr. Robert Bruner, Darden Graduate School of Business Administration, University of Virginia. (Summer 1986).

*Research Assistant*, Washington Service, Washington, DC (1983-1985).

## Professional Activities

Vice Chair, Antitrust Practice Group of American Health Lawyers Association. 2008-2014.

## Academic Honors

DuPont Scholar, University of Virginia

American University Presidential Scholar

Phi Kappa Phi, Mortar Board, Omicron Delta Epsilon

## Presentations and Publications

"What's the Right Price? Disputes Over Payments to Out-of-Network Providers," Presentation at AHLA Annual Meeting, June 2017.

"Theory and Estimation of Cross-Market Competitive Effects," Presentation at ABA/AHLA Antitrust in Healthcare Conference, May 2016.

"An Examination of New Theories on Price Effects on Cross- Market Hospital Mergers," www.blog.aha.org/post/160407, April 2016.

"Cross-Market Theories of Harm to Competition in Healthcare," *Economists Ink*, Winter 2016.

**Presentations and Publications (continued)**

"Issues in Health Plan Consolidation," Credit Suisse Healthcare Conference, December 2015

"Cross-Market Health Care Provider Mergers: The Next Enforcement Frontier," *Antitrust*, coauthor (with Scott D. Stein), Fall 2015.

"Bargaining Models in Antitrust Reviews of Healthcare Transactions," presentation at ABA/AHLA Antitrust in Healthcare Conference, May 2014.

"Healthcare Antitrust Bootcamp Webinar Series, Part II: Mergers, Affiliations and Acquisitions," webinar presentation for AHLA Antitrust Practice Group, November 2013.

*Antitrust and Healthcare: A Comprehensive Guide* (chapter on medical staff privileges and exclusive contracts), published by AHLA, 2013.

"Economics of Hospital Competition: Price Regulation," presentation at FTC Microeconomics Conference, November 2012.

"Provider Power Uses and Abuses," presentation at ABA/AHLA Antitrust in Healthcare Conference, May 2012.

"FTC v. Pro Medica: Views from Both Sides of a Contested Merger," webinar presentation for AHLA Antitrust Practice Group, April 2012.

*Market Definition in Antitrust, Theory and Case Studies* (chapter on healthcare provider markets), published by ABA, March 2012.

"Reexamining DOJ's Predation Analysis in *United Regional,*" *Antitrust Health Care Chronicle*, January 2012.

"Healthcare Antitrust Bootcamp Webinar Series, Part V: Monopolization," webinar presentation for AHLA Antitrust Practice Group, January 2012.

"Antitrust Guidance for ACOs: Understanding the Antitrust Enforcement Agencies' Final Policy Statement," webinar presentation for AHLA Antitrust Practice Group, November 2011.

"Powerful Hospital Meets Powerful Payor," presentation at AHLA Annual Meeting, June 2011.

"Price Variation Analysis in the Massachusetts Attorney General's Hospital Costs Study," presentation at AHLA Annual Meeting, June 2011.

**Presentations and Publications (continued)**

"The ABCs of Calculating Damages in MCO Litigation," presentation before ACI Advanced Forum on Managed Care Disputes and Litigation, May 2011.

"Antitrust Market and ACOs," *CPI Antitrust Chronicle*, coauthor (with John M. Gale), May 2011.

"Antitrust and ACOs," webinar presentation for AHLA Antitrust Practice Group, April 2011.

"*Omnicare*: The Rationality of Unilateral Actions and Proof of Antitrust Conspiracy," *Economists Ink*, coauthor (with Kent W Mikkelsen and John M. Gale), Spring 2011.

"What Was Left Unsaid in *Omnicare* About Harm to Competition," *Antitrust Healthcare Chronicle*, coauthor (with John M. Gale and Kent W Mikkelsen), March 2011.

"Health Insurance Transactions: Insights from the Front Line," presentation sponsored by the Health Care and Pharmaceuticals Committee of the ABA Antitrust Section, November 2010.

"The Deepwater Horizon Oil Spill and Seafood Prices," *Environmental Law Reporter*, November 2010.

"Implications for Healthcare Transactions of the Revised 2010 DOJ/FTC Merger Guidelines," Member briefing for AHLA Antitrust Practice Group, September 2010.

"Measuring the Impact of the BP Deepwater Horizon Oil Spill on Seafood Prices," *Economists Ink*, Fall 2010.

*Evaluating Federal and State Antitrust Reviews of Health Insurance Mergers*, editor and co-author, published by AHLA, September 2010.

"Predicting Post-Merger Price Effects: The Use of Hospital Merger Simulations at the FTC," Presentation sponsored by Health Care and Pharmaceuticals Committee of the ABA Antitrust Section, June 2010.

"Why Don't Health Insurance Markets Work Like Other Markets? Or Do They?" Webinar presentation for AHLA Antitrust Practice Group, April 2010.

"Innovations in Hospital Merger Simulation," *Economists Ink*, Winter 2010.

**Presentations and Publications (continued)**

"Emerging Antitrust Policy and Practice in Health Care Mergers," webinar presentation for Womble Carlyle Sandridge & Rice, December 2009.

"An Innovative Approach to an Old Problem: Hospital Merger Simulation," *Antitrust*, coauthor (with Richard T. Shin), Fall 2009.

"Looking for Anticompetitive Price Effects: FTC's Retrospective Studies of Hospital Mergers," Member Briefing for AHLA Antitrust Practice Group, May 2009.

"Exclusionary Conduct Part I: The Current Landscape of Provider vs. Payor Litigation," teleconference presentation for AHLA Antitrust Practice Group, April 2009.

"An Economic Model of Competition Between General Hospitals and Physician-owned Specialty Facilities," *The Antitrust Bulletin,* vol. 52 Fall-Winter 2007 (also printed in *Antitrust Health Care Chronicle*, July 2006).

"Fundamentals of Health Care Antitrust Economics," presentation sponsored by the Economics Committee and the Health Care Committee of the ABA Antitrust Section, November 2007.

"Hospital Competition with Physician-Owned Specialty Facilities," presentation before ABA program on Physician Ownership of Hospitals and Other Health Facilities: Antitrust and Policy Issues, October 2007.

"The *PeaceHealth* Standard for Bundled Predation and Recoupment," *Economists Ink,* Fall 2007.

"Predatory Bundling and Recoupment in the Ninth Circuit's *PeaceHealth* Decision," *Antitrust Health Care Chronicle*, October 2007.

"Bundled Discounting in Contracts for Patient Care Services," presentation before ABA/AHLA Antitrust in Health Care Conference, September 2007.

"ASC – Hospital Competition: An Economist's Perspective," presentation before FASA 2006 Conference, May 2006.

"Competition in Utah Health Care Markets," report to the Privately Owned Health Care Organization Task Force of the Utah Legislature, May 2006.

"FTC v. Evanston Northwestern: A Change From Traditional Hospital Merger Analysis?" *Antitrust*, coauthor (with Barry C. Harris), Spring 2006.

**Presentations and Publications (continued)**

"Specialty Hospital Turf Wars: An Antitrust Economics Perspective," presentation before Pennsylvania Bar Institute Health Law Institute, March 2006.

"Hospital-ASC Competition," presentation before CASCA Public Policy Symposium, March 2006.

"Issues in Market Definition in Healthcare: Specialty Hospitals," presentation before ABA/AHLA Conference on Antitrust in Healthcare, May 2005.

"Issues in Market Definition for Physician Services," presentation before FTC/DOJ Health Care and Competition Law Hearings, September 2003.

"Challenges for the FTC Hospital Merger Retrospectives," *Economists Ink*, Spring-Summer 2003.

"Conceptual and Practical Considerations for the FTC Retrospectives," presentation before American Bar Association, Health Law Section, Section of Antitrust Law Conference on Antitrust in Healthcare 2003, May 2003.

"Post-Merger Hospital Conduct: Conceptual and Practical Challenges," presentation before FTC/DOJ Health Care and Competition Law and Policy Hearings, April 2003.

"Issues in Litigating Hospital Mergers – Back to Basics," presentation before FTC/DOJ Health Care and Competition Law and Policy Hearings, March 2003.

"Economic Analysis of Healthcare Cost Studies Commissioned by Blue Cross Blue Shield Association," coauthor (with Margaret E. Guerin-Calvert, *et al.*), prepared for American Hospital Association, February 2003.

"Continued Role for Managed Care in Hospital Merger Analyses," *Economists Ink*, Fall 2002.

"Economic Incentives in a Hospital Privileges Context," *Economists Ink*, coauthor (with Barry C. Harris), Winter 2001.

"In-Network Diversion by Managed Care," *Economists Ink*, Winter 2000.

"Most Favored Nation Clauses," *Economists Ink*, coauthor (with Barry C. Harris), Spring/Summer 1999.

"Unilateral Effects and the Closeness of Substitution," *Economists Ink*, coauthor (with Barry C. Harris), Fall 1998.

**Presentations and Publications (continued)**

*The Economics of a Disaster: The Exxon Valdez Oil Spill,* Quorum Books, coauthor (with Bruce M. Owen, *et al.*), October 1995.

"Competition and Consolidation in Health Care," presentation before Lancaster County Business Group on Health, April 1995.

"Misunderstanding the Role of Competition in Controlling HealthCare Expenditures," *Economists Ink*, coauthor (with Barry C. Harris), Fall 1993.

"Misunderstanding the Role of Competition in Controlling Health Care Expenditures," *Health Law Litigator,* American Bar Association, Section of Litigation, Health Law Litigation Committee, coauthor (with Barry C. Harris), Fall 1993.

"Calculating Damages Under Oil Pollution Act," *Economists Ink,* Winter 1991.

*An Economic Analysis of the Effect of the Exxon Valdez Oil Spill on the Price of Alaskan Seafood,* coauthor (with Bruce M. Owen, *et al.*), December 1991.

"Dividing Cartel Profits: The Southern Railway and Steamship Association," *Essays in Economic and Business History*, Edwin J. Perkins, ed., Vol. IX, 1991.

*Virginia's Local Economies,* Center for Public Service, Charlottesville, Virginia. A series of 30 studies, authored or coauthored (with George E. Barnes) 10 studies. January 1990–August 1990.

*Targeting Industries in Virginia*, Center for Public Service, Charlottesville, Virginia, coauthor (with John L. Knapp, *et al.*) on four separate studies, September 1989.

*Southwest Virginia Target Industry Study*, Center for Public Service, Charlottesville, Virginia, coauthor (with John L. Knapp, *et al.*), December 1987.

# Exhibit 2

# LONA FOWDUR

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## Education

Ph.D., Economics, Cornell University, 2009.
M.A., Economics, Cornell University, 2007.
B.A., Economics (First Class Honors), University of Adelaide (Australia), 2002.
B.A., Finance, University of Adelaide (Australia), 2001.

## Professional Experience

Senior Vice President, Economists Incorporated
January 2018 – Present.

Vice President, Economists Incorporated
January 2017 – December 2017.

Senior Economist, Economists Incorporated
June 2009 – December 2016.

## Professional Activities

AHLA Antitrust Practice Group
Vice Chair of Strategic Initiatives, 2018 – Present.

ABA Antitrust Section Healthcare and Pharmaceutical Committee
Advisory Board Member, 2017 – Present.

## Testimony

Expert report on behalf of defendants in Unites States v. State of Mississippi (No. 3:16cv 622 CWR-FKB, U.S. District Court for the Southern District of Mississippi, Northern Division), September 2018.

Expert report on behalf of the California Department of Corrections and Rehabilitation in Ralph Coleman *et al.* v. Edmund J. Brown Jr. *et al.* (No. CIV S-90-0520 KJM KJN P, U.S. District Court for the Eastern District of California), August 2018.

Expert report on behalf of Abington Memorial Hospital (PA) for mediation hearing re. Steven Meller, M.D., v. Abington Memorial Hospital *et al.* (No. 03:08221, Court of Common Pleas of Montgomery County), April 2018.

Expert report and deposition on behalf of Forest Labs (Allergan) in J.M. Smith Corporation *et al.* v. Actavis PLC *et al.* (No. 15-cv-7488, United States District Court for the Southern District of New York), November 2017.

Testimony, expert report and deposition on behalf of Anthem Inc. in United States *et al.* v. Anthem Inc. and Cigna Corp. (No. 1:16-cv-01493, United States District Court for the District of Columbia), October-December 2016.

## Other Selected Matters

### *Healthcare:*

Consulted for CalPERS and provided economic analyses to support rate negotiations with health plans. (2018)

Consulted for the State of Connecticut Office of the Attorney General and provided economic analyses of hospital transactions in the state. (2014-2018)

Competition and damages analyses in Medical Center of Elizabeth Place v. Premier Health Partners. (2016-2017)

Expert report on behalf of AmSurg Holdings addressing issues of antitrust liability and non-compete provisions in physician contracts. (2016)

Analyses on behalf of merging parties for Hart-Scott-Rodino review of transaction by Federal Trade Commission and state agencies pertaining to transactions between the following entities:

- Penn State Hershey Medical Center and Pinnacle Health in Harrisburg area, PA (2015);
- Penn State Hershey Medical Center and St. Joseph Regional Health Network in Hershey/Reading, PA (2015);
- Mercy Medical Center and Siouxland Surgery Center in Sioux City, IO (2014);
- HCA West Florida and Citrus Memorial Hospital in Citrus County, FL (2013);
- Somerset Medical Center and Robert Wood Johnson University Hospital in New Brunswick, NJ (2013);
- Stellaris Health Network's and Hudson Valley Hospital Center in Westchester County, NY (2011);
- Community Health System and Moses Taylor Hospital in Scranton area, PA (2011);
- Northeast Health, St. Peters and Seton Hospital in Albany, NY (2010);
- PinnacleHealth and WellSpan Health in Harrisburg area, PA (2009).

Analyses of allegations of foreclosure in Monroe Surgical Hospital, LLC v. St. Francis Medical Center, Inc., Monroe, LA (2015).

Analyses of allegations of monopolization and exclusionary conduct in 32nd Street Surgery Center v. Right Choice Managed Care Inc., Joplin MO, (2014).

Analyses of ambulatory surgery markets and allegations of exercise of market power in Medical Center at Elizabeth Place LLC v. MedAmerica Health Systems Corporation et al. (2014).

Analyses of ambulatory surgery markets and allegations of exercise of market power in Kissing Camels Surgery Center, LLC et al. v. HCA Inc. et al. (2014).

Competitive assessment of horizontal and vertical issues regarding the acquisition of Saltzer Medical Group by St. Luke's Health System in Saint Alphonsus Health System, Treasure Valley Hospital and Federal Trade Commission v. St. Luke's Health System (2013).

Economic impact analysis for major health system in northeastern US using IMPLAN modeling software (2013).

Analyses of hospital and physician markets in northern California in dispute over health plan payment rates in Sutter Health v. Kaiser Health System (2012).

Analysis of anticompetitive foreclosure allegations against Wilson Medical Center by physician who lost hospital privileges, Goldsboro, NC (2009).

***Energy:***

Analyses on behalf of an electric utility company regarding rate recovery issues within PJM. (2017)

Analysis on behalf of merging parties for Hart-Scott-Rodino review of transaction by the Department of Justice in the following consummated mergers:

- Dynegy acquisition from Duke Energy and Energy Capital Partners (ECP) (2014);
- NRG Energy acquisition of GenOn Energy (2012);
- Exelon Corp's acquisition of Constellation Energy (2012);
- Mirant Corporation and RRI Energy merger to create GenOn Energy (2010);
- FirstEnergy Corp. acquisition of Allegheny Energy (2010).

Competitive analysis of Exelon Corp's acquisition of PEPCO Holdings for review of transaction by the Maryland Public Service Commission (2015).

Market power analyses of Seaway Crude Oil Pipeline on behalf of the Canadian Association of Petroleum Producers (2015).

Analyses on behalf of TransCanada in various proceedings at FERC pertaining to different issues of fact:

- Puget Sound Energy, Inc., *et al.* v. Sellers of Energy and/or Capacity at Wholesale into Electric Energy and/or Capacity Markets in the Pacific Northwest. EL01-10-085, Federal Energy Regulatory Commission (2012);

- San Diego Gas & Electric Company v. Sellers of Energy and Ancillary Services, EL00-95-000, Federal Energy Regulatory Commission (2009);

- People of the State of California, ex rel; Edmund G. Brown Jr. Attorney General of the State of California v. Powerex Corp., *et al.*, EL09-56-000, Federal Energy Regulatory Commission (2009);

- People of the State of California, ex rel; Bill Lockyer, Attorney General of the State of California v. Powerex Corp., *et al.*, EL02-71-000, Federal Energy Regulatory Commission (2009).

Analysis of allegations that a traditional vertically-integrated electric utility used its transmission system to impede rival generation companies (2012).

Analysis for triennial update for authority for market-based rates for Public Service Electric and Gas Company *et al.*, FERC Docket No. ER97-837-014 (2010).

***Other:***

Analyses of Robinson-Patman price-discrimination allegations and damages in supplier/distributor dispute in St. Thomas, Virgin Islands (2017).

Competitive analyses for Hart-Scott-Rodino review of acquisition of Horizon Lines by Pasha Group (2015).

Analyses of allegations of exclusionary contracts and market allocation by manufacturers and distributors of bleach in North Carolina and Virginia (2013).

## Speaking Engagements and Panel Discussions

ABA/AHLA Antitrust in Healthcare Conference: Cutting Edge Economics for Future Merger Cases (May 17-18, 2018)

AHLA Healthcare Transactions Conference: No More Flying under the Radar: Antitrust Scrutiny of Physician-Practice Acquisitions (May 9-10, 2018)

ABA Section of Antitrust Law: 66th Antitrust Law Spring Meetings: Fundamentals – Economics (April 11-13, 2018)

ABA Section of Antitrust Law Healthcare and Pharmaceutical Committee Educational Call: The FTC's Challenge of the Sanford Health/Mid Dakota Clinic Transaction (February 27, 2018)

## Publications

The Two-Stage Model of Competition in Hospital Merger Analysis May be Due for an Update, *Economists Ink,* Fall 2018.

An Examination of New Theories on Price Effects of Cross-Market Hospital Mergers, *Economists Incorporated mimeo*, Fall 2016, with David Argue.

Recent Performance of Medicare ACOs Does Not Indicate Universally Lower Costs or Improved Quality, *Economists Ink,* Fall 2015, with John Gale.

Geographic Market Definition: Equivalence between Hypothetical Monopolist Test and Tampa Electric, *Economists Ink,* Spring 2014.

Court Rejects Standards for Debit Card Interchange Fee Cap, *Economists Ink,* Fall 2013.

Health Care Reform; Provider Affiliations and Health Care Risks, *Competition Policy International*, Summer 2012, Volume 7 Number 1, with John Gale.

Racial Bias in Expert Quality Assessment: A Study of Newspaper Movie Reviews, *Journal of Economics and Behavioral Organization*, April 12, 2012, with Vrinda Kadiyali and Jeffrey Prince.

Calibration of Upward Pricing Pressure under the New DOJ/FTC Horizontal Merger Guidelines, *Economists Ink,* Fall 2011.

The Intel-AMD Antitrust Suits: Economic Issues and Implications, *American Bar Association Section of Antitrust Law Communications & Digital Technology Industries Newsletter: ICARUS*, Winter 2010.

FTC and DOJ Release Draft of Revised Horizontal Merger Guidelines, *Economists Ink*, Special Issue, May 2010.

Merger Guidelines to be Reviewed, *Economists Ink*, December 2009.