The Doctor's Pen and the Payer's Bargain: Insurer Ownership of Primary Care

Dalya Elmalt*
Department of Economics
University of Wisconsin–Madison†

November 15, 2026
Click here for latest version

Abstract

Congress is weighing a ban on insurer ownership of physician practices. Theory gives no clear answer: integration can eliminate double marginalization and pass savings to consumers, or let the insurer raise rivals' costs and extract more from Medicare. I take both sides to the data using a national insurer's 2020 acquisition of the largest primary care chain in an Oregon market. All-payer claims show the same doctors treating every insurer's patients. The harm side shows up: rival insurers pay the acquired clinics 13 percent more for the same office visit, and the clinics record more diagnoses for the owner's Medicare Advantage enrollees than for rivals', so Medicare pays more for them. The efficiency side does not: the owner gets no hospital discount, and although its enrollees are referred to specialists 21 percent less often, its premiums do not fall.

*I am deeply grateful to Ashley Swanson, Alan Sorensen, and Naoki Aizawa for their invaluable advice and guidance. I thank the Oregon Health Authority and its All Payer All Claims Reporting Program team for providing the data. This paper uses data from the Oregon All Payer All Claims Reporting Program, provided by the Oregon Health Authority under a data use agreement. The views expressed are mine and do not necessarily reflect those of the Oregon Health Authority. All errors are my own.

†Email: elmalt@wisc.edu

1 Introduction

U.S. health care has consolidated rapidly over the past two decades, and much of this consolidation is vertical: firms at one stage of care acquire firms at another. As of 2024, 77.6 percent of U.S. physicians worked for a hospital, health system, or corporate entity rather than an independent practice (Physicians Advocacy Institute and Avalere Health, 2024). The acquirers are increasingly not hospitals. Corporate entities now own 30.1 percent of physician practices, surpassing hospitals and health systems (28.4 percent) for the first time (Physicians Advocacy Institute and Avalere Health, 2024). Health insurance firms, in particular, have moved into care delivery: practices operated by major insurers accounted for 4.2 percent of primary care services among Medicare beneficiaries in 2023, up from 0.78 percent in 2016 (Adler et al., 2025). Congress is now considering banning this ownership: two Senate bills, one of them bipartisan, would prohibit insurers from owning physician practices (U.S. Senate, 2025, 2026).

The U.S. spent 17.2 percent of GDP on health in 2024, nearly double the OECD average of 9.3 percent (OECD, 2025). Much of this gap reflects higher prices rather than more care (Anderson et al., 2003; Papanicolas et al., 2018), and prices are highest where providers face less competition (Cooper et al., 2019). Hospital acquisitions of physician practices have been shown to raise prices and spending and steer patients toward the acquiring hospital regardless of its cost (Baker et al., 2014; Neprash et al., 2015; Koch et al., 2017; Capps et al., 2018; Cooper et al., 2025). Much less is known about the effects of insurers acquiring physician practices, in which a single firm is both a patient's insurer and their provider.

In this paper, I study the effects of vertical integration between a private insurer and independent primary care clinics on prices and on physician behavior that drives health spending, such as coding intensity and gatekeeping. To do that, I (1) draw on existing theory to show how ownership changes the bargaining of an insurer that employs primary care providers (PCPs) with rival insurers and its physicians' incentives; (2) build a panel of PCPs and their patients from all-payer claims, which observe every insurer's prices and patients at the same PCPs, linked to *PitchBook*, Agency for Healthcare Research and Quality (AHRQ) ownership records, the national provider registry, and public provider directories, to identify who owns each primary care practice in each year and track PCPs as they move between practices; (3) estimate how one large acquisition changed three prices: the prices rival insurers pay the acquired clinics, the prices the acquiring insurer pays local hospitals, and the acquiring insurer's Medicare Advantage premiums; and (4) test whether the PCPs the insurer employs record more diagnoses for its enrollees and refer them less to specialists.

The prior literature on vertical integration in economics has highlighted a range of potential benefits and harms of integration, making the effects of a particular transaction theoretically ambiguous. The elimination of double marginalization, for example, is one of the main potential benefits of integration: when an upstream and a downstream firm integrate, they can reduce their downstream price by maximizing their joint profits (Spengler, 1950). Other potential benefits of integration are cost reductions, improved coordination, and better alignment of incentives when contracts are incomplete (Williamson, 1971; Grossman and Hart, 1986; Tadelis, 2013). Vertical in-

tegration can also have negative consequences. In models with foreclosure and raising rivals' costs, a company that has vertically merged with an upstream supplier of an input can strategically limit its competitors' access to that input or raise the price of the input to rivals (Ordover et al., 1990; Rey and Tirole, 2007).

Prices in health care are set through bilateral negotiations between insurers and providers. When an insurer acquires physician practices, it sits on both sides of these negotiations: it buys care for its own enrollees while selling care to rival insurers whose enrollees see the same PCPs. Ownership gives the insurer control over the margins I study: prices (what rival insurers pay at its practices, what it pays hospitals, and the premiums its enrollees pay), how intensively its physicians code diagnoses, and how often they refer patients for costly specialist and hospital care. Each of these margins affects the profits of both the insurer and its rivals. As a result, the same PCPs may face different incentives depending on whether a patient is enrolled in the owner's plan or a rival's plan.

I study these incentives in a national insurer's 2020 acquisition of the largest chain of primary care clinics, by number of PCPs, in a local Oregon market. I refer to the acquirer as the *VI insurer* and to the acquired practices as the *VI clinics* throughout (VI for vertically integrated), and describe the transaction and market in Section 2. Using claims from 2017 to 2023, I follow the VI clinics' PCPs and their patients in both commercial insurance and Medicare Advantage (MA) markets. Commercial insurance is mostly employer-sponsored, and its prices are negotiated between each insurer and each practice. MA plans are private plans that cover people aged 65 and older in place of traditional Medicare; the government pays them a fixed amount per enrollee, higher for enrollees with more recorded diagnoses, and they typically pay physicians a percentage of traditional Medicare's administered prices. I use the acquisition as a case study to investigate five ways ownership could change these incentives, in four groups: rival insurers' costs, coding, the VI insurer's own costs, and its premiums. Existing economic theory on vertical integration, insurer–hospital bargaining, and risk adjustment signs the direction of the price rival insurers pay, of coding, and of referrals, and leaves two, hospital prices and premiums, ambiguous.

First, ownership can raise rival insurers' costs, through the price they pay the VI clinics. Prices are set in bargaining, in which each side's position depends on its gains from trade: what it earns with an agreement minus what it would earn without one. The side that would lose less if negotiations failed obtains the better price. When any practice fails to reach an agreement with an insurer, some of that insurer's enrollees switch plans to keep their physician. An independent practice can recapture these patients if they switch to another insurer, and is then paid that insurer's price for them. The VI clinics recapture them the same way, but those who switch to the VI insurer's plan are worth more to the VI insurer and clinics together (the VI pair): the pair earns both the clinics' margin on their visits and the insurer's margin on their enrollment, while the price the VI insurer pays its own clinics is a transfer within the firm. Disagreement therefore costs the VI clinics less than it costs an independent practice, which strengthens their position when negotiating with rivals and creates an incentive to raise rivals' costs. This is an externality of

integration: the VI pair gains at the expense of rival insurers, and of the enrollees and employers who pay for their coverage. Prediction 1 is that rival insurers pay the VI clinics more. I test it by comparing their prices at the VI clinics with their prices at independent practices.

Second, ownership changes the incentive to record diagnoses. The Centers for Medicare & Medicaid Services (CMS) pays MA insurers more for enrollees with more recorded diagnoses, regardless of the care provided (Geruso and Layton, 2020), so recording more diagnoses for the same patient, often called upcoding, raises the insurer's revenue without any change in the patient's health or care. The physicians who record the diagnoses bear the cost, in time, visits, and tests, but when they are paid a fee for each visit, they receive none of the extra revenue. An insurer can align their incentives with its own by owning the practice, as the VI insurer does here, or by capitating it, shifting part of the financial risk and revenue of its patients to the practice. Prediction 2 is that the VI clinics record more diagnoses for the VI insurer's MA enrollees than for rival insurers' enrollees, which I measure through their risk scores after the acquisition.

Third, ownership can lower the VI insurer's own costs: what it pays hospitals and what its enrollees' referrals cost. Hospital care is the largest category of health spending (Centers for Medicare & Medicaid Services, 2024), and an insurer negotiates hospital prices against what each side would lose if the hospital left its network (Ho and Lee, 2017): the hospital loses less when it can recapture the insurer's enrollees, who switch to a rival plan to keep access to it, and the insurer loses more when many of its enrollees would leave to keep that hospital. Both losses depend on how strongly patients are tied to the hospital, and patients largely go where their physician refers and admits them (Ho and Pakes, 2014; Baker et al., 2016). An insurer that employs those physicians can therefore direct referrals and admissions among in-network hospitals by price, so a hospital that holds out for a high rate risks losing patients to cheaper hospitals in the network (Gowrisankaran et al., 2015). This threat pushes the hospital's price down, provided hospitals compete. Because the hospital price applies to all of the insurer's enrollees, not only the clinics' patients, these savings could be large. But ownership also makes each enrollee worth more to the insurer, which now earns the practice's margin as well as its own, so losing the enrollees who would follow the hospital costs it more, and this raises the price. Prediction 3 is therefore ambiguous: the VI insurer pays hospitals less only if steering outweighs the higher value of each enrollee, which is more likely the more hospitals compete. I test it with its Medicare Advantage inpatient prices at the dominant local hospital system.

The VI insurer's other cost is specialist care. PCPs act as gatekeepers to specialist care: in plans that require referrals, patients need a referral from their PCP before the plan covers specialist care, which gives the PCP a direct lever over downstream spending. An independent PCP does not pay for the care they refer patients to and has little reason to limit referrals. Under insurer ownership, because the VI insurer pays its enrollees' specialist and hospital bills, it gains when its physicians refer those enrollees less often, and, more generally, when they manage those enrollees' care to avoid costly services such as emergency department visits. Prediction 4 is that the VI clinics refer the VI insurer's enrollees less often. As for coding, I compare the VI insurer's enrollees with

rival insurers' enrollees at the VI clinics. I also check whether their emergency department use rises.

Fourth, the premium is where the main efficiency argument for vertical integration would show up. Once the insurer owns the practice, the price it pays the practice is a transfer within the firm, so eliminating double marginalization would lower the insurer's premiums rather than that price, provided it competes for enrollees on premiums; any saving on hospital prices would reach premiums the same way. Under Prediction 5, the VI insurer's premiums fall relative to rival insurers' only if its costs fall and the saving is passed through; its Medicare Advantage premiums are the test.

Studies of insurers that own providers have measured networks, specialist use, and coding, but not the prices rival insurers pay at the practices an insurer acquires. Cuesta et al. (2024) study insurer–hospital integration in Chile: integrated insurers design plan networks that favor their own hospitals, rival insurers restrict access to integrated hospitals to limit the threat of raised costs, and the resulting weaker competition among hospitals outweighs the beneficial effects of the elimination of double marginalization. Insurer–provider integration also reduces specialist use (Cho, 2025), and coding intensity rises under insurer ownership and capitation (Marr et al., 2026; Grasley and Guido, 2025). Marr et al. (2026) study a national insurer's acquisitions of physician practices across the country with Medicare data and find that coding intensity rises at the acquired practices. Grasley and Guido (2025) study one insurer's 2017 acquisition of a large primary care practice in Colorado. Comparing its MA enrollees with other insurers' enrollees at the same practice, the design I use for coding, they find that the practice records more diagnoses for the acquiring insurer's enrollees after the acquisition, and that coding rises by a similar amount at independent practices that the insurer pays under capitation contracts.

I add to this work in three ways. First, I measure five different channels in one acquisition, with the same data and the same comparison groups: the prices rival insurers pay, coding, what the owner pays hospitals, referrals, and premiums. Prior studies each measure one; measuring them together shows who gains from integration and who pays, and whether the owner's own costs fall. Second, I measure the prices rival insurers pay at practices an insurer has acquired; because no rival insurer drops the VI clinics from its network,[1] any increase isolates raising rivals' costs through price rather than exclusion. Third, I look for evidence of the main efficiency argument in the Medicare Advantage inpatient prices the VI insurer pays the dominant local hospital system and its public Medicare Advantage premiums. Each of these requires data on the acquirer's competitors as well as its own enrollees, which all-payer claims provide.

To measure these effects, I use three comparisons. For rival insurers' prices, I compare the VI clinics with independent primary care practices in the same local market, which face the same local demand and insurers, using difference-in-differences and event-study designs with PCP fixed effects and pre-period tests for differential trends. For hospital prices, I compare the VI insurer's prices with rival insurers' prices for the same admission at the same hospital, and I compare

[1] The claims flag whether each line is in network; every rival insurer's claims at the VI clinics are flagged in network in every year from 2017 to 2023.

premiums with a descriptive difference-in-differences. For coding and referrals, I compare the VI insurer's enrollees with rival insurers' enrollees who are patients of the same clinics, which separates the incentives created by ownership from a general change in practice style after the acquisition. Because local independent practices may themselves respond to the acquisition, I also report results using independent practices elsewhere in Oregon, which are not close substitutes for the VI clinics, in Appendix D.

I find that ownership raises the prices rival insurers pay. In commercial insurance, rival insurers' prices for an office visit at the VI clinics move little in 2020–21 and are about 13 percent ($38)[2] higher than at independent practices in the same market in 2022–23. In Medicare Advantage, rival contracts are written as a percentage of the Medicare fee schedule, the list of administered prices traditional Medicare pays. Measured against each contract's own schedule, rival insurers' MA prices at the VI clinics are about 2 percent higher on average than at independent practices over the same period.

Ownership also changes how the VI clinics' PCPs record their patients' diagnoses. From 2022, the risk scores of the VI insurer's own MA enrollees rise by about 5 percent relative to rival insurers' enrollees at the same clinics. The increase comes mainly from diagnoses recorded at the VI clinics: diagnoses recorded by every other provider the same patients see do not rise significantly, and the patients do not use more outpatient hospital, emergency, or specialist care, as they would if they had become sicker.

The evidence on the VI insurer's own costs is weaker. It does not pay the dominant local hospital system less: its MA inpatient prices there do not fall significantly relative to rival insurers' prices for the same admission (an imprecise decline of about 3 percent appears only in 2023), despite the VI clinics' patients accounting for about a fifth of that system's admissions before the acquisition. After the acquisition, the VI clinics refer the VI insurer's MA enrollees to specialists about 3.6 percentage points (21 percent of the pre-period rate) less often than rival insurers' enrollees at the same clinics. This decline reverses a rise in the VI clinics' referrals that was already under way before the deal, so the pre-period is not flat and the size is uncertain. These enrollees do not make more emergency department visits. Finally, the VI insurer's Medicare Advantage premiums do not fall relative to rival insurers'.

Taken together, the measurable gains to an insurer that employs physicians come mostly from rival insurers and Medicare; any savings from fewer referrals do not reach its Medicare Advantage enrollees as lower premiums. Rival insurers pay more for the same visits with the same PCPs, and Medicare pays more for the same patients because the VI clinics record more risk for them. Both the price and the coding effects appear in 2022. The effects on the VI insurer's own costs, through referrals, are smaller and less precisely estimated. I do not measure quality of care or health, so these results describe prices, payments, and care use, not welfare.

These incentives apply to any insurer that employs physicians who also treat rival insurers' enrollees. How these incentives play out depends on the market. I study a mid-sized market with

[2]Percent changes in the text are log points.

one dominant hospital system, in which the acquired chain is a provider no rival insurer dropped, so the bargaining incentive shows up as higher prices rather than exclusion. With a single dominant hospital system, moreover, the insurer has little room to steer patients elsewhere. Where the acquired chain is easier to replace, rival insurers may instead limit their enrollees' access to it, as they avoid integrated hospitals in Cuesta et al. (2024); where hospitals compete, steering could lower the prices the integrated insurer pays. The pricing result is the classic vertical harm of raising rivals' costs (U.S. Department of Justice and Federal Trade Commission, 2023), arising here in a transaction with no horizontal overlap.

The rest of the paper proceeds as follows. Section 2 describes the acquisition and the market. Section 3 describes the data and the sample. Section 4 states five predictions, sets out the empirical strategy, and presents the results for rival insurers' costs, coding, the VI insurer's own costs, and premiums; Appendix E sets out the framework behind the predictions. Section 5 discusses what the results imply about how integration works and who bears its costs, and Section 6 concludes.

2 Institutional Setting

I study the effects of insurer–PCP vertical integration in Oregon, where a large national insurer has acquired several independent primary care clinics, with the largest purchase occurring in 2020 in the state's fourth most populous county, home to about 10 percent of the state's population.

The primary care market. Oregon's rules define a primary care provider as a physician, naturopath, nurse practitioner, or physician assistant whose clinical practice is in family medicine, general internal medicine, naturopathic medicine, obstetrics and gynecology, pediatrics, or general psychiatry (Oregon Health Authority, 2026). Instead, I follow the narrower definition Medicare uses for its primary care payments, which counts physicians in family, internal, geriatric, and pediatric medicine, plus nurse practitioners and physician assistants (Centers for Medicare & Medicaid Services, 2010), and so excludes psychiatrists, naturopaths, and obstetrician-gynecologists. Excluding obstetrician-gynecologists also keeps specialty care out of the comparison: at the VI clinics they work in a separate women's health department that provides obstetric care, including deliveries. The price and referral results are robust to adding them back (Appendix C.3.1). In 2019, 24 percent of the county's PCPs practiced at the VI clinics, 38 percent at the hospital system, 32 percent at independent practices, and 7 percent at private-equity-backed practices.[3] The VI clinics saw a larger share of patients than their share of PCPs: about a third of the county's MA residents and 40 percent of its commercial residents who saw a PCP.

The insurance market. Both local insurance markets are concentrated by the antitrust agencies' standard, although the commercial market is among the least concentrated in the country and only moderately concentrated in national metro-area data (Section 5). In 2019, the three largest

[3]These shares exclude VA, county, community health center, and tribal clinics, which are paid under separate public rules, and the university's student health center, which serves only enrolled students; most of their patients are not commercially insured, so they do not compete with the VI clinics for rival insurers' enrollees. PCPs include nurse practitioners and physician assistants and exclude obstetrician-gynecologists, and a PCP is in the county if most of their patients live there.

insurers held 77 percent of the county's residents' commercial enrollment (Herfindahl–Hirschman index, HHI, 2,448 in the state's enrollment data) and 85 percent of its MA enrollment (HHI 2,920).[4] Most commercial enrollees were in preferred provider organization (PPO) plans, which cover care from any network provider without a referral (60 percent), or point-of-service (POS) plans, which ask enrollees to choose a PCP but cover out-of-network care at higher cost-sharing (25 percent). Across these plan types, 18 percent were in self-funded employer plans.

The VI insurer. The insurer I study does not own hospitals. In Oregon, its business is concentrated along the state's less densely populated western border. In the county it insures about 7 percent of the commercial market over the study period, and its share of the county's Medicare Advantage enrollment rose from 31 percent in 2019 to over half from 2020 on. Most of the rise came at the open enrollment for 2020, held before the acquisition closed, when a large rival health maintenance organization (HMO) plan lost most of its enrollees[5]; the drop in that insurer's enrollment and the rise in the VI insurer's are about the same size. Anecdotal evidence also suggests that enrollees could not have chosen the VI insurer because of the deal, which was not publicly announced until 2024. The VI insurer sells three products in the market: fully insured commercial plans, in which the insurer bears the cost of claims; self-funded commercial plans, in which the employer bears that cost and the insurer only administers the plan; and Medicare Advantage. Starting in 2022, the VI insurer also paid several independent PCP clinics in the market by capitation for its largest MA plan.

How prices are set. The two markets set prices differently. MA contracts are typically written as a percentage of the Medicare physician fee schedule, so MA prices move with Medicare's fees, and the negotiation is over a single percentage. Commercial contracts are negotiated, either as a percentage of Medicare's fees, as in MA but at a negotiated percentage, or as a price for each service, and they differ widely across insurers, practices, and market segments. In MA, rival insurers pay nurse practitioners and physician assistants about 85 percent of the physician rate.

Capitation. Rival insurers also capitate primary care. One rival insurer capitates the VI clinics' MA office visits, and from 2022 it capitates the MA visits at the PCPs integrated with the hospital system. Oregon's claims-reporting rules require insurers to report, for each capitated service, the amount that would have been paid had the service not been capitated, so capitated visits still appear in the claims with a price. Insurers must also report each line's payment type, capitated or fee-for-service, to the Oregon Health Authority, a field required, and observed in the data, from 2022.

The hospital market. The county's inpatient market is close to a duopoly: one nonprofit system accounts for about three quarters of admissions and provides nearly all specialized care, such as

[4]The VI insurer's commercial enrollment includes the self-funded employer plans it administers, which appear in the data under a separate insurer code. MA figures are from CMS's December county enrollment files, excluding plans that cover only prescription drugs; commercial figures are from the state's enrollment files. One insurer that appears under two codes is counted once.

[5]The plan types differ in how freely enrollees can see providers. An HMO covers care only from its network and usually requires a PCP referral to see a specialist. A PPO covers care from any network provider without a referral. A POS plan asks enrollees to choose a PCP and covers out-of-network care at higher cost-sharing.

cardiac surgery and neonatal intensive care, and the other general hospital, investor-owned and without these services, accounts for most of the rest. Hospital concentration of this degree is typical of U.S. metropolitan areas (Section 5). Physicians admit and refer their patients to these hospitals, which is what gives an insurer that employs physicians potential leverage over hospital prices.

3 Data and Sample Construction

3.1 Claims data

The main data I use in this paper are Oregon's All Payer All Claims (APAC) database for 2017–23,[6] which contains medical claims and member records from the insurers operating in the state and lets me follow each patient's care and costs over time. For each claim line I observe the insurer and the insurance product, the patient's age, sex, diagnoses, and residential ZIP code, the procedure, the place of service, the rendering clinician's and the billing organization's identifiers, the amount allowed by the insurer, and the amount paid. I study commercial insurance and Medicare Advantage (MA) separately. Most importantly for this paper, the data record the price every insurer pays every clinician for the same service, and the complete visit and referral histories of each PCP's patients, whichever insurer covers them, which I use to attribute patients to PCPs, to measure referrals to specialists, and to measure the care patients receive.

3.2 Prices

I measure a price as the allowed amount: the total the insurer and the patient together pay the provider for a claim line. I measure prices on in-network lines for the services that both the VI clinics and independent practices bill. The VI clinics also employ specialists and run their own laboratory and imaging, which independent practices do not, so I exclude services billed only at the VI clinics, as well as laboratory and imaging services, so that the two groups are compared on the same services. I remove denied lines, which carry no allowed amount, and reversals, which cancel an earlier claim, and keep one line per clinician, patient, date, procedure, and insurer, so that no service is counted twice; in MA, when a patient has two plans, I keep the primary plan's line, so that each price is the contracted price of one unit of the same service in the same setting; Appendix B lists each restriction and its reason. Every price comparison compares physicians with physicians, and nurse practitioners and physician assistants with each other, because rival insurers pay nurse practitioners and physician assistants less than physicians (Section 2).

In MA, some lines are paid under capitation: the insurer pays the practice a fixed amount per enrollee rather than a fee per visit. The insurer still reports each capitated visit as a claim line, with the price it would have paid without capitation as the allowed amount, because Oregon's

[6]Source: Oregon Health Authority (2025). All Payer All Claims Reporting Program. Limited data file; Salem, Oregon: Oregon Health Authority. The data are used under Data Use Agreement 6523 with the Oregon Health Authority, which reviews products that use the data before release.

reporting rules require the fee-for-service equivalent of every capitated service,[7] and it pays the practice outside the claim; the claims record which lines are capitated only from 2022. I therefore keep capitated lines in price comparisons and never use the paid amount as a price. The rival insurer that capitates the VI clinics prices capitated and fee-for-service lines on the same schedule, so capitation does not change the price it reports; Appendix B describes how the payment-type field differs across insurers.

3.3 Primary care providers and markets

No field in the claims distinguishes PCPs from specialists, so I identify every PCP in the state in two steps. I start from every physician, nurse practitioner (NP), and physician assistant (PA) who renders care in the state between 2017 and 2023. First, I exclude clinicians who report a specialty. A physician whose taxonomy in the National Plan and Provider Enumeration System (NPPES) is a specialty or subspecialty, such as cardiology, dermatology, or psychiatry, is not a primary care provider. This leaves physicians who report a generalist taxonomy (family medicine, internal medicine, general practice, geriatrics, general pediatrics, and obstetrics and gynecology) and NPs and PAs, who usually report no specialty at all. I then drop obstetrician-gynecologists (Section 2).

Second, because a generalist taxonomy does not guarantee that a clinician practices primary care, and NPs and PAs work in both primary and specialty care, I classify each remaining clinician in each year from the services they bill, the breadth of their patients' diagnoses, and the organization they bill under, and verify unclear cases by hand against public provider directories. Appendix A describes each step and its thresholds. In the VI clinics' county the specialty step removes 3 of the 454 clinicians on the county's candidate list (0.7 percent).

I assign each clinician to a market by where they bill most of their claims and where their patients live, not by the address they report: a clinician belongs to the VI clinics' county in a year if most of their claims that year are billed there and most of their patients that year live there. I do not use reported addresses because they are often out of date (Appendix B).

Group membership varies by year. I verify each PCP in the VI clinics' market by hand, checking their identity and practice, and assign each PCP-year to the organization under which the PCP bills the majority of their claims that year: a PCP-year belongs to the VI clinics if most of the PCP's claims that year are billed under them, and to the control group otherwise. Each claim line's organization is its billing tax identifier; when it is blank, I fill it from the same claim or from the clinician's only billing organization that year.

I keep PCPs observed both before and after the acquisition, so that each PCP contributes to both periods and the comparison is not driven by entry and exit, which leaves 173 PCPs: 77 who bill at the VI clinics and 102 who bill elsewhere in the county (six bill under the VI clinics in some

[7] Oregon Administrative Rule 409-025-0100, which governs what insurers report to the All Payer All Claims database, requires a "prepaid amount" on capitated services and defines it as "the fee for the service equivalent that would have been paid for a specific service if the service had not been capitated" (Oregon Health Authority, 2020). A "capitated service" is one rendered under a contract that pays the provider a fixed monthly amount per enrollee.

years and under another organization in others). Appendix A reports the count at each step. Each analysis uses the PCPs among them who have the claims it studies (for example, office visits by the VI insurer's MA enrollees for referrals), so the number of PCPs differs across analyses; each table reports it.

3.4 Ownership

Identifying who is a PCP is separate from identifying who owns each PCP's practice. Every comparison requires knowing who owns each PCP's practice in each year, both in the VI clinics' market and in the markets that supply the out-of-market controls (Appendix D), because the control group must contain only practices whose incentives are those of an independent practice rather than those of a hospital system, a private equity firm, or an insurer. The claims do not record who owns a practice, and practices change hands during the period, so ownership has to be built.

Ownership is assigned by year, from *PitchBook* and the Agency for Healthcare Research and Quality's ownership records, verified by hand against public announcements, regulatory filings, state reports, and news articles. *PitchBook* records the details of the acquisition and of the other transactions in the state: the smaller clinics the VI insurer bought later, and the clinics bought by hospital systems and private equity firms. The AHRQ records give the name and location of each clinic in the acquired chain and of the practices that belong to health systems. Neither source links to the claims: the claims record no owner, and the AHRQ records carry no billing identifier, so the two can be matched only by name, and the match fails for the VI clinics, which bill under a legal name different from the clinics' names. I therefore build by hand a table that links every billing organization in the state's claims, about 20,000 in all, to its owner in each year, and check each owner against the AHRQ records and the public sources above. Because each PCP-year is also assigned to the organization the PCP bills under, a PCP who moves between practices changes group in the year of the move, and a practice that is acquired changes group in the year of the acquisition. Practices that the VI insurer bought later, and practices owned by a health system or a private equity firm, are kept out of the control group in the years they are owned, so that neither later purchases nor other owners' incentives contaminate the comparison. The result is an ownership history for every organization that bills primary care in the state, which identifies the independent practices in each year rather than at a single date; it will be part of the replication package.

3.5 Treated and control PCPs

The treated group consists of the PCPs at the VI clinics. The control group consists of PCPs in the same county at independent practices, which are not owned by a hospital or health system, a private equity firm, an insurer, or an integrated delivery system. Practices owned by a hospital system, an insurer, or another integrated organization bargain under their owner's contracts and face their owner's incentives over coding and referrals, so they are a less natural comparison for

an independent group that becomes integrated. A control PCP enters the sample only in years in which they bill at an independent practice (Appendix B lists the organizations excluded and why). This rule removes 313 of the 586 control PCP-years (53 percent) and 48 of the 102 control PCPs entirely, mostly years at a private-equity-owned urgent care chain and at the county health center; it removes no VI-clinic years (Appendix Table 10). Years spent at hospital systems, integrated delivery systems, university health services, single-specialty practices, and other institutions are dropped before this step, so a PCP who moves between the VI clinics and an independent practice contributes to each group only in the years spent there. The across-clinic referral check that follows doctors instead uses each PCP's ever-VI status, so the six PCPs who bill under the VI clinics in some years count as VI in all years. The main sample contains 77 PCPs at the VI clinics and 54 at independent practices in the county over 2017–23, of whom 74 and 47 practice in 2019. As a check on the price results, I also use the dominant hospital system's primary care practices as a control group (Section 4.2.3). The VI clinics' PCPs include 8 pediatricians; the independent practices in the sample include no pediatric practice, and no obstetrician-gynecologists are in the sample. Appendix Table 10 shows how each step changes the sample, by group and year. Table 1 compares the two groups in 2019. The VI clinics' PCPs are busier, with 772 patients each vs. 420 at independent practices, and receive higher prices: across all insurers, the average allowed amount is $277 for a commercial office visit at the VI clinics, against $212 at independent practices, and $126 against $112 in MA. Their patients are similar in age and sex, the share of nurse practitioners and physician assistants is similar, and the VI insurer covers a similar share of each group's patients, commercial and MA together (8 and 9 percent). The VI clinics' MA patients have slightly lower practice-coded risk scores (0.68 against 0.72) and are referred to specialists somewhat more often (16.2 against 14.1 percent of visits).

3.6 Outcomes

For prices, the outcome is the log allowed amount of a claim line, most often for an established-patient office visit of moderate complexity, the most common primary care service; for hospital prices, it is the log facility price of an inpatient admission. For coding, the outcome is the patient's CMS-HCC risk score (version 24), the score CMS uses to pay MA plans, computed each year from the diagnoses on any claim billed by the VI clinics, because these are the diagnoses the practice itself records and the ones its coding incentives can move; I also compute it from all of the patient's claims, and from claims by every other provider, as a placebo. For referrals, the outcome is whether a primary care office visit is followed within 90 days by a new-patient visit to a specialist, excluding dermatology, ophthalmology, podiatry, and allergy, which patients commonly see without a referral; a 90-day window captures about two thirds to three quarters of the new-patient specialist visits that follow a PCP visit within a year, and extending it to 180 days adds 10 to 20 percentage points (Appendix Figure 7); visits without a referral count as zero. For care use, the outcomes are counts per patient-year of emergency department visits, hospital outpatient visits, primary care office visits, specialist visits, imaging, procedures, and laboratory services, and inpatient and hospital

Table 1: PCPs in 2019: VI clinics vs. independent practices

	VI clinics	Independent practices	Difference	(Standard error)
PCPs (2019)	74	47		
NP / PA share	0.284	0.319	−0.035	(0.087)
Patients per PCP, all	772	420	352***	(61)
Patients per PCP, commercial	514	280	234***	(45)
Patients per PCP, MA	259	141	118***	(27)
Patient age	49.6	51.0	−1.373	(2.930)
Female patients (share)	0.589	0.599	−0.010	(0.026)
MA risk score (practice-coded)	0.678	0.717	−0.040*	(0.023)
Office visit price, commercial ($)	277	212	66***	(3)
Office visit price, MA ($)	126	112	14***	(1)
VI insurer's patient share (all insurance)	0.079	0.090	−0.011	(0.012)
Referral rate, MA visits	0.162	0.141	0.021**	(0.010)

Notes: This table summarizes the characteristics of primary care providers (PCPs) at the VI clinics (column 1) and at independent practices in the same county (column 2) in 2019, the last full year before the acquisition; each PCP is one observation. Patients are those with an office visit at the PCP's practice in 2019. Prices are average allowed amounts, across all insurers, for an established-patient office visit of moderate complexity. The risk score is the CMS-HCC score computed from diagnoses recorded at the PCP's practice. The referral rate is the 2019 average of each PCP's share of MA office visits (all insurers) followed within 90 days by a new-patient visit to a specialist, excluding dermatology, ophthalmology, podiatry, and allergy. Column 3 reports the difference between columns 1 and 2, and column 4 its standard error. $^{*}p<.10$, $^{**}p<.05$, $^{***}p<.01$

outpatient spending.

4 Results

This section tests five predictions. Section 4.1 states them and sets out the comparison that tests each one, and Sections 4.2 to 4.5 take the results in four groups: rival insurers' costs, upcoding, the VI insurer's own costs, and premiums; each ends with a summary of results.

4.1 Predictions and empirical strategy

Existing economic theory on vertical integration, insurer–hospital bargaining, and risk adjustment gives five predictions for an insurer that owns primary care practices; Appendix E sets out the arguments in one framework. The first concerns rival insurers' costs, the second coding, the third and fourth the VI insurer's own costs, and the fifth its premiums.

1. **Raising rivals' costs.** Rival insurers pay the VI clinics more than they pay independent practices. When a rival insurer and a practice fail to agree, some of the rival's enrollees switch plans to keep their physician; those who switch to the VI insurer are worth more to the VI pair, which earns both the insurance margin and the practice's margin on them, so disagreement costs the VI clinics less and their price rises (Ho and Lee, 2017).
2. **Upcoding.** In MA, the VI clinics record more diagnoses for their owner's enrollees than for

rival insurers' enrollees at the same clinics: each diagnosis raises the government's payment to the owner (Geruso and Layton, 2020), while rival insurers' enrollees bring the owner no such gain.

3. **Hospital prices.** The effect on what the VI insurer pays hospitals is ambiguous. An insurer that employs PCPs can threaten to steer their referrals away from a hospital that holds out for a high price, which lowers the price if hospitals compete (Gowrisankaran et al., 2015; Prager, 2020); but each enrollee is worth more to the integrated firm, so losing the enrollees who would follow the hospital costs it more, which raises the price.
4. **Gatekeeping.** The VI clinics refer their owner's enrollees to specialists less often, because the owner pays their specialist and hospital bills, while rival insurers' enrollees at the same clinics are referred as before.
5. **Premiums.** The VI insurer's premiums fall relative to rival insurers' only if its costs fall, through the elimination of double marginalization on the VI clinics' services (Spengler, 1950), fewer referrals, or lower hospital prices, and it passes the saving on to its enrollees.

Each prediction calls for a different comparison (Table 2). For the prices rival insurers pay, the question is whether a rival insurer pays more at the VI clinics than elsewhere, so I compare what the same rival insurer pays for the same service at the VI clinics vs. at independent practices in the same market, before and after the acquisition. For coding and referrals, the comparison exploits the fact that the VI insurer's incentive differs across the patients of the same clinics: the VI insurer gains from more recorded diagnoses and fewer referrals for its own enrollees, but not for rival insurers' enrollees. I therefore compare the VI insurer's enrollees with rival insurers' enrollees who are patients of the VI clinics, with patient fixed effects and fixed effects for each PCP in each year. Because both groups are treated by the same PCPs in the same years, this comparison does not depend on choosing a control group of practices: any change in the gap reflects the VI insurer's incentive rather than a general change in how the practice operates after the acquisition. For hospital prices, the question is whether ownership lowered what the VI insurer pays the dominant local hospital system, so I compare the VI insurer's price with rival insurers' prices for the same admission at the same hospital, before and after the acquisition. For premiums, I compare how the VI insurer's MA plan premiums in the county changed after the acquisition with how rival insurers' premiums changed, weighting plans by enrollment, a difference-in-differences in means, which I read as descriptive: the gap between them was already narrowing before the acquisition, and one treated insurer with three to six plans a year cannot be compared precisely.

Each result is estimated as an event study: the gap between the treated and comparison groups in each year from 2017 to 2023, relative to 2019, with fixed effects for the units whose persistent differences I absorb and for the cell within which observations are compared each year. Each subsection writes out its own equation. The acquisition closed in 2020; I report 2020 in every event study but do not use it to identify the main effects. To summarize each result, I replace the year indicators with a single post-period term for 2021–23 and drop 2020, a partial year of ownership and the first year of the pandemic, so the pooled estimate compares 2021–23 with 2017–19 (for

coding, 2022–23, when the rise begins; Section 4.3).

The comparison across practices identifies the effect of the acquisition if, absent the acquisition, outcomes at the VI clinics and at independent practices would have evolved in parallel. The comparisons within the VI clinics and within the dominant health system require that the gap between the VI insurer's enrollees and rival insurers' enrollees of the same providers would have stayed constant; because both groups see the same providers, this comparison holds fixed everything about the providers that changes over time, including the change in ownership itself, and isolates whether they treat the owner's enrollees differently from other patients after the acquisition. A change in practice style after the acquisition that affects all of the clinics' patients moves both groups and cancels in this comparison; if the VI clinics' PCPs also change how they treat rival insurers' enrollees, for example by coding every patient more intensively, the comparison understates the effect, so it is conservative. Section 4.3 tests for this spillover. If the relevant assumption holds, the event-study coefficients for 2017 and 2018 should be small and jointly insignificant; I report the joint test for every result. Where the pre-period coefficients are not zero, I also report the price estimates with a linear pre-trend removed and the referral estimates measured against 2017–18. A threat specific to this setting is that the composition of patients and physicians may change after the acquisition; depending on the comparison, the fixed effects hold the PCP, the patient, or the insurer's contract fixed throughout.

Why this acquisition. The acquisition was not random: the VI insurer chose to buy the market's largest group of PCPs, and chose when. The comparisons do not require it to be. The price comparison holds fixed the rival insurer, its contract, the service, and the clinician, so it is biased only by something that raised rival insurers' prices at the VI clinics, but not at independent practices, from 2022, for a reason other than ownership; Section 4.2.3 rules out a change in whom the clinics treat, horizontal market power, and a response by local independent practices. The coding and referral comparisons hold fixed the clinics, the PCP, and the year, so any change in how the clinics operate after the acquisition that affects all their patients, such as new physicians or new systems, cancels out. They are biased only by something that changed how the same PCPs treat the VI insurer's enrollees relative to rival insurers' enrollees for a reason other than ownership, such as a change in who enrolls with the VI insurer or in its plans' rules. Sections 4.3 and 4.4.2 check these: other providers' diagnoses of the same patients, patients who never switch insurer, PCPs present before and after the acquisition, and, for referrals, the same plan's enrollees across clinics. What the comparisons cannot address is which practices insurers choose to buy: the results describe an insurer that buys the largest primary care group in its market, and Section 5 discusses how far they extend.

The pandemic overlaps the post-period. Every comparison is between groups observed in the same market and the same years, so a common pandemic shock is differenced out; it threatens a comparison only if it affected the VI clinics differently from independent practices, or the VI insurer's enrollees differently from rival insurers' enrollees at the same clinics. Dropping 2020 from

the pooled estimates also removes the first pandemic year.

I cluster standard errors by PCP, which allows for arbitrary correlation in a PCP's outcomes over time and gives about 70 to 130 clusters in the main comparisons; for the hospital comparison I cluster by hospital and diagnosis-related group. I also report wild cluster bootstrap p-values for the main price, coding, and referral estimates (MacKinnon and Webb, 2017), which give the same conclusions (Tables 3, 4, 6, and 8). Appendix C.1.1 collects every robustness check, with its event study, by result.

Table 2: Comparisons

Comparison	Used for	Held fixed
VI clinics vs. independent practices, rival insurers' claims	Rival insurers' prices (Prediction 1)	The insurer's contract (product, market segment, funding type, network) and the year; each PCP at their clinic; patient characteristics
The VI insurer's vs. rival insurers' enrollees, same clinics	Coding (Prediction 2); referrals (Prediction 4)	The patient; the PCP in each year
The VI insurer vs. rival insurers, same hospital	Its prices at the hospital system (Prediction 3)	The diagnosis-related group at each hospital and in each year
The VI insurer's MA plans vs. rival insurers' plans in the county	Premiums (Prediction 5); descriptive	The insurer and the year; plans weighted by their enrollment

Notes: Standard errors are clustered by PCP (by hospital and diagnosis-related group for hospital prices). The note to each results table lists its exact fixed effects and controls. Event studies omit 2019; pooled estimates compare 2021–23 with 2017–19 and drop 2020 (for coding, 2022–23 with 2017–19, dropping 2020 and 2021).

4.2 Rival insurers' costs

Prediction 1 concerns the price rival insurers pay the VI clinics. I take commercial insurance and MA in turn, then the checks that apply to both.

4.2.1 Commercial insurance

I estimate the following equation on rival insurers' claim lines only, comparing what rival insurers pay at the VI clinics with what they pay at independent practices in the same market for the same service. For a claim line ℓ of patient e, billed by PCP d at clinic c under rival insurer j's contract cell g with modifier m in year t,

$$y_\ell = \sum_{k \neq 2019} \beta_k \left(VI_c \cdot \mathbf{1}[t = k] \right) + \delta_{gt} + \alpha_{dc} + \mu_{jm} + X'_{et}\lambda + \varepsilon_\ell, \tag{1}$$

where y_ℓ is the log allowed amount; VI_c equals one for the VI clinics; δ_{gt} is a fixed effect for the contract cell (insurer, product, market segment, funding type, and network tier) by credential by year; α_{dc} is a PCP-by-clinic fixed effect; μ_{jm} is an insurer-by-modifier fixed effect; and X_{et} holds

the patient controls used in the price regressions: age, age squared, sex, and the patient's average Elixhauser comorbidity index in 2017–19, with the weights of van Walraven et al. (2009). When an outcome pools several procedures, as the all-services estimate does, the cell and the PCP-by-clinic effects are also interacted with the procedure. The pooled version replaces the year terms with $\beta\,(VI_c \cdot Post_t)$. The fixed effects keep every comparison within one insurer's contract cell (Section 4.1), allow prices to change differently each year for physicians and for nurse practitioners and physician assistants, whom rival insurers pay less, and absorb persistent differences between PCPs. The main estimate pools rival insurers, weighting each insurer-year by its 2017–19 share of independent practices' lines, so that a change in the mix of insurers over time does not appear as a change in price (Table 3, column 1); as a check, column 2 estimates each insurer's own path and averages them at the VI clinics' 2017–19 insurer mix.

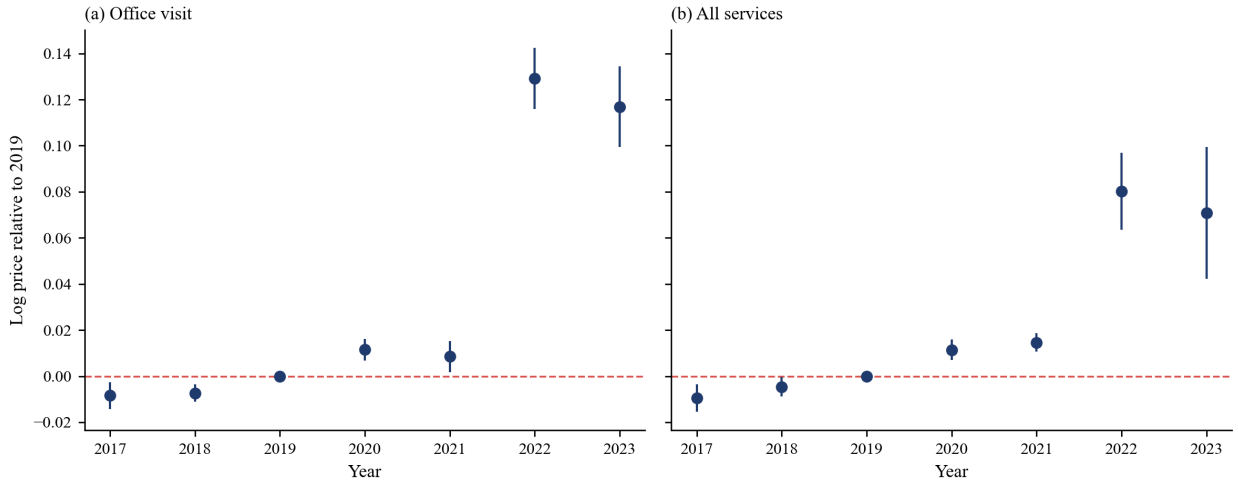


Figure 1: Rival insurers' commercial prices at the VI clinics, relative to independent practices: office visits (a) and all services (b)

Notes: Panel (b): services offered at both the VI clinics and independent primary care practices (Table 3). Estimates of Equation (1) (Table 3), 2019 omitted; insurers pooled, weighted by their 2017–19 share of independent practices' lines; Appendix Figure 12 holds each insurer's weight fixed at its 2017–19 share. 95 percent confidence intervals, standard errors clustered by PCP.

Figure 1 and Table 3 show the result for office visits. Rival insurers' prices at the VI clinics move little in 2020–21 (about 1 percent relative to independent practices) and then jump in January 2022: they are about 13 percent higher in 2022–23 than in 2017–19 (Table 3, second row), or roughly $38 per visit at the VI clinics' 2019 mean price of $277. Before the acquisition the VI clinics' prices were slightly lower in 2017–18 than in 2019 relative to independent practices, by less than 1 percent, a small but statistically significant pre-trend; removing a linear pre-trend still leaves an increase of about 7 percent for 2021–23 and 11 percent for 2022–23, and allowing post-period departures from parallel trends up to twice the largest pre-period departure gives a 95 percent interval of 0.065 to 0.198 for the 2022 coefficient (Rambachan and Roth, 2023). Holding each insurer's weight fixed at the VI clinics' 2017–19 mix gives the same path (column 2; Appendix Figure 12), so the increase is not a change in which insurers the VI clinics see. The increase does not depend on which visit I use:

in 2022–23 it is 14 percent for the low-complexity visit, 13 percent for the moderate-complexity visit, 14 percent for the high-complexity visit, whose pre-period is flat, and 13.5 percent for all established visits pooled.

Across all services that both the VI clinics and independent practices bill, rival insurers' commercial prices at the VI clinics rise by 6.0 percent from 2017–19 to 2021–23 and by 8.4 percent from 2017–19 to 2022–23 (Table 3, column 3, and Figure 1b). With insurer weights fixed at the 2017–19 mix the increase is 5.7 and 7.8 percent (column 4), and removing a linear pre-trend leaves 4.1 and 5.9 percent.[8] The pre-period coefficients are small and negative: before 2019 these prices were rising slightly at the VI clinics relative to independent practices, by about 1 percent.

4.2.2 Medicare Advantage

Most rival MA contracts are written as a fixed percentage of the Medicare fee schedule and update automatically when Medicare's fees change. Comparing raw MA prices across contracts is misleading, because contracts follow different Medicare fee schedules. I therefore estimate Equation (1) as for commercial insurance, with two differences: the outcome y_ℓ is the log of the allowed amount over the Medicare fee on the schedule the contract follows that year, and the low- and moderate-complexity established-patient visits (99213 and 99214) are pooled, with the cell and PCP-by-clinic effects interacted with the visit code. I estimate it on all rival insurers' MA office visits together, weighting each insurer by its 2017–19 share of the VI clinics' rival MA visits and excluding two insurers whose MA business in the county largely fades during the period.[9] Relative to independent practices, the VI clinics' rival MA prices rise by about 2 percent over 2022–23: 2.4 percent pooled and 2.1 percent with insurer weights fixed at the 2017–19 mix (Table 4; Figure 2). Over 2021–23 the increase is 1.7 percent pooled and 1.2 percent with fixed weights. The pooled estimate has no significant pre-trend at the 5 percent level ($p = 0.09$); the fixed-weight estimate's pre-trend test rejects, and removing a linear pre-trend from the pooled estimate gives 1.9 percent over 2022–23. Over 2022–23 the change differs across rival insurers, from about 1 percent at the largest rival insurer to about 4 percent at the insurer with the largest increase; an insurer with less than 1 percent of these visits sees a decline. The increase does not depend on the visit level: for the low-complexity visit alone it is 2.0 percent over 2021–23 and 2.5 percent over 2022–23.

[8] I exclude immunization and injection administration (CPT 90471 and 96372). At the VI clinics, rival insurers' price for these services fell from about $64 in 2017–18 to about $40 in 2021, starting in 2019, before the acquisition, and by the same amount at every rival insurer, which suggests a change in the clinics' billed charges rather than renegotiated contracts; independent practices' prices for them did not change. Including them lowers the estimates to 3.8 percent for 2021–23 and 6.6 percent for 2022–23, and the pre-period test rejects (Appendix Table 11). Adding back blood draws and vision screening, which independent practices bill far less often per visit and which I also exclude, gives nearly the same estimates (5.9 and 8.3 percent).

[9] Their MA claims in the county fall sharply, from 2019 for one and from 2020 for the other, at the VI clinics and at independent practices alike, which leaves too few later visits to estimate a change in their prices. Physicians, NPs, and PAs are pooled, with a credential fixed effect.

Table 3: Rival insurers' commercial prices at the VI clinics: office visit and all services

	Office visit		All services	
	Pooled	Fixed insurer weights	Pooled	Fixed insurer weights
	(1)	(2)	(3)	(4)
VI × Post (2021–23)	0.089***	0.084***	0.060***	0.057***
	(0.006)	(0.006)	(0.007)	(0.008)
VI × Post (2022–23)	0.130***	0.122***	0.084***	0.078***
	(0.008)	(0.008)	(0.010)	(0.012)
Pre-trend test, p-value	0.001	<0.001	0.005	0.001
Procedure codes	1	1	56	56
Observations (lines)	125,606	147,665	505,261	596,394
VI clinics | independent practices	84,355 | 41,251	99,270 | 48,395	346,760 | 158,501	409,658 | 186,736
Patients, VI clinics | independent practices	29,898 | 14,477	32,063 | 15,766	52,259 | 28,525	54,074 | 29,812
PCP-years, VI clinics | independent practices	367 | 214	439 | 254	367 | 217	439 | 258
PCPs, VI clinics | independent practices	77 | 51	77 | 52	77 | 53	77 | 55
PCP clusters	127	128	129	131
VI mean price in 2019, dollars	277.45	277.45	202.94	202.94
Contract cell × credential × year FE	Yes	Yes		
Procedure × contract cell × credential × year FE			Yes	Yes
PCP × clinic FE (all services: × procedure)	Yes		Yes	
PCP × clinic × insurer FE (all services: × procedure)		Yes		Yes
Separate estimate for each insurer, averaged at 2017–19 weights		Yes		Yes
Insurer × modifier FE	Yes	Yes	Yes	Yes
Patient controls	Yes	Yes	Yes	Yes

Notes: This table presents difference-in-differences estimates of rival insurers' commercial prices at the VI clinics, relative to independent practices in the same county. The outcome is the log allowed amount of a claim line; the VI insurer's own claims are excluded. Columns 1 and 2 use the established-patient office visit of moderate complexity. Columns 3 and 4 use all services offered at both the VI clinics and independent primary care practices: a procedure enters if it has at least 20 rival commercial lines at both the VI clinics and independent practices in 2017–19 and in 2021–23. The VI clinics also employ specialists, and services only they offer are excluded, as are laboratory, imaging, blood-draw and vision-screening services and the immunization and injection administration codes. Columns 1 and 3 pool rival insurers, weighting each insurer-year by its 2017–19 share of independent practices' lines. Columns 2 and 4 estimate each insurer's own path and average them with weights fixed at the VI clinics' 2017–19 insurer mix, so changes in which insurers the VI clinics see cannot move the estimate. VI × Post compares 2021–23 with 2017–19, leaving out 2020; the second row compares 2022–23 with 2017–19, leaving out 2020 and 2021 (the year-by-year estimates are in Figure 1). Removing a linear pre-trend fitted to the 2017–19 event-study coefficients gives 0.070 over 2021–23 and 0.106 over 2022–23 for office visits, and 0.041 and 0.059 for all services. All columns control for patient age, age squared, sex, and 2017–19 comorbidity. Insurers enter if they have at least 200 lines at both the VI clinics and independent practices before and after 2021. Standard errors clustered by PCP in parentheses. Wild cluster bootstrap p-value for VI × Post (2021–23), clustered by PCP (Webb weights, 9,999 replications): < 0.001. $^{*}p<.10$, $^{**}p<.05$, $^{***}p<.01$

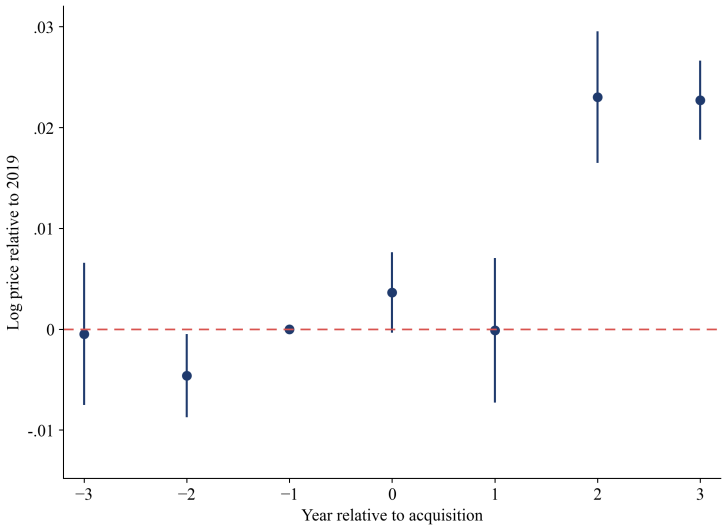


Figure 2: All rival insurers' Medicare Advantage prices for office visits at the VI clinics, relative to independent practices

Notes: Estimates of Equation (1) on all rival insurers' MA office visits, each price measured relative to the Medicare fee on its own contract's schedule that year; insurers weighted by their 2017–19 share of the VI clinics' rival MA visits. 2019 omitted; 95 percent confidence intervals, standard errors clustered by PCP.

The MA increase is much smaller than the commercial one, for three likely reasons. First, MA physician prices sit close to traditional Medicare's and vary far less than commercial prices (Trish et al., 2017): MA contracts are written as a percentage of the Medicare fee schedule, so the negotiation is over a single percentage, while commercial prices vary widely across insurers and practices, which leaves more room to raise them. Second, the VI clinics already had a smaller premium in MA: in 2017–19 rival insurers paid them about 123 percent of the Medicare fee for a moderate-complexity visit in MA, against about 111 percent at independent practices, while in commercial insurance they paid the VI clinics about 2.6 times the Medicare fee and independent practices about 1.9 times. Third, the VI insurer already held over half of the county's MA enrollment, so raising its MA rivals' costs further, and pushing them out of the market, is more likely to draw the attention of regulators than raising the costs of rivals in a commercial market where it is small.

Table 4: Rival insurers' Medicare Advantage prices for an office visit at the VI clinics

	Pooled	Fixed insurer weights
	(1)	(2)
VI × Post (2021–23)	0.017***	0.012***
	(0.003)	(0.002)
VI × Post (2022–23)	0.024***	0.021***
	(0.003)	(0.002)
Pre-trend test, p-value	0.089	<0.001
Observations (lines)	86,264	86,234
VI clinics | independent practices	52,470 | 33,794	52,452 | 33,782
Patients, VI clinics | independent practices	7,654 | 5,138	7,644 | 5,132
PCP-years, VI clinics | independent practices	318 | 206	318 | 206
PCPs, VI clinics | independent practices	69 | 48	69 | 48
PCP clusters	116	116
VI mean price in 2019, dollars	106.00	106.00
Contract cell × credential × year FE, by procedure	Yes	Yes
PCP × clinic FE, by procedure	Yes	
PCP × clinic × insurer FE, by procedure		Yes
Separate estimate for each insurer, averaged at 2017–19 weights		Yes
Insurer × modifier FE	Yes	Yes
Patient controls	Yes	Yes

Notes: This table presents difference-in-differences estimates of rival insurers' Medicare Advantage prices for an established-patient office visit of low or moderate complexity at the VI clinics, relative to independent practices in the same county; the VI insurer's own claims are excluded. The outcome is the log of the allowed amount over the Medicare physician fee for the same code and county on the fee schedule the contract follows that year, so a contract that tracks Medicare shows no change when Medicare revalues office visits. Column 1 pools all rival contracts, weighting each insurer-year by the insurer's 2017–19 share of the VI clinics' lines; two small insurers whose MA business in the county largely fades during the period are excluded. Column 2 estimates each insurer's own VI × Post (with PCP × clinic × insurer fixed effects) and averages them with the same fixed 2017–19 weights, so changes in which insurers the VI clinics see cannot move the estimate. VI × Post (2021–23) compares 2021–23 with 2017–19, leaving out 2020; the second row compares 2022–23 with 2017–19, leaving out 2020 and 2021 (year-by-year estimates are in Figure 2). Removing a linear pre-trend fitted to the 2017–19 event-study coefficients gives 0.012 over 2021–23 and 0.019 over 2022–23 for the pooled estimate. Both columns include the same patient controls as Table 3. Table 1 reports the average 2019 price of a moderate-complexity visit (99214) across all insurers, averaged over PCPs; the VI mean price here is rival insurers' 2019 price for low- and moderate-complexity visits (99213 and 99214), weighted by visits, excluding the two insurers above. Standard errors clustered by PCP in parentheses. Wild cluster bootstrap p-values for both VI × Post rows, clustered by PCP (Webb weights, 9,999 replications): < 0.001. $^{*}p<.10$, $^{**}p<.05$, $^{***}p<.01$

4.2.3 Checks on rival insurers' prices

The checks below apply to both the commercial and the MA increase.

Is it who the clinics treat? One concern is that the increase reflects a change in whom the VI clinics treat or which insurers they bill, rather than in what rival insurers pay for the same visit. The fixed effects already compare the same clinicians under the same contract cell for the same visit, and holding each insurer's weight fixed at the 2017–19 mix gives the same path (Table 3, column 2). Keeping only PCPs who practiced at the same organization before and after the acquisition gives a commercial increase of 0.129 over 2022–23, so the increase does not come from new hires, and adding the obstetrician-gynecologists and pediatric practices the main sample omits gives a similar estimate. Nor did the VI insurer steer its enrollees toward the clinics: its main MA plan's (its largest MA plan's) share of the VI clinics' MA patients in 2023, 37 percent, matches its share at other practices in the county (36 to 38 percent). Appendix Table 12 and Figure 8 report every check.

Is it the control group? Another concern is that independent practices in the same county responded to the acquisition themselves, for example if rival insurers changed what they pay them. I therefore also compare the VI clinics with matched independent practices elsewhere in Oregon, which are not exposed to the VI clinics. With the same five rival insurers and fixed insurer weights, the commercial increase is 8.0 percent over 2022–23 (standard error 1.5), with a flat pre-period, against 12.2 percent with same-county controls; the MA increase is about the same as with same-county controls, though its pre-period is less flat (Appendix D). Using the dominant hospital system's primary care practices as controls gives nearly the same commercial increase, 12.7 percent over 2022–23, and a larger MA increase, 3.7 percent over 2021–23, with a flat pre-period ($p = 0.63$), although the hospital system's rival MA prices can move with its hospital contracts (Appendix C.1.2).

Is it market power or quality? The increase could instead reflect horizontal market power, but the VI clinics' share of the county's primary care fell after the acquisition: between 2019 and 2023, from 24 to 21 percent of PCPs and from 40 to 30 percent of commercial residents who saw a PCP. Rival insurers might also pay more because the VI clinics' quality or costs rose. One part of quality is having care coordinated under one roof, with in-house specialists, imaging, and laboratory services; but the VI clinics offered this before the acquisition, so it is part of their higher pre-period prices, which the comparison differences out. The increase also appears in a single step in 2022, when contracts are renegotiated, rather than gradually, as rising costs would raise prices. I do not measure quality, so I cannot rule it out, although the outcome is the price of a defined service: the same office visit, of the same complexity, by the same clinician. The increase is therefore not a longer or more complex visit, but quality the visit code does not capture, such as how attentive or easy to reach the physician is, could still have changed.

Summary of results. Relative to independent practices, rival insurers pay the VI clinics about 13 percent more for the same commercial office visit over 2022–23 (8 percent across all services) and about 2 percent more in MA. The increase appears in 2022, holds for the same clinicians, contract cells, and insurer mix, and has the same sign against out-of-market and hospital-system controls; the commercial pre-trend is small but statistically significant, and removing it leaves 11 percent over 2022–23. Table 5 collects the estimates.

Table 5: What rival insurers pay the VI clinics: summary

	Post 2021–23	Post 2022–23	Pre-trend p
Log points × 100			
Commercial, office visit	8.9 (0.6)	13.0 (0.8)	0.001
Commercial, services billed by both groups[a]	6.0 (0.7)	8.4 (1.0)	0.005
All rival MA contracts, office visits	1.7 (0.3)	2.4 (0.3)	0.09

Notes: The first column compares 2021–23 with 2017–19 and drops 2020; the second compares 2022–23 with 2017–19 and drops 2020 and 2021. [a]Services offered at both the VI clinics and independent primary care practices; the VI clinics also employ specialists, and services unique to them are excluded, as are laboratory and imaging services, which independent practices do not provide in house, and blood draws and vision screening, which the VI clinics bill far more often per visit. Immunization and injection administration are excluded because the VI clinics' price for them fell, starting in 2019, by the same amount at every rival insurer (Appendix Table 11). Standard errors in parentheses.

4.3 Upcoding

Prediction 2 states that ownership gives the VI pair an incentive to record more diagnoses for its own MA enrollees, whose risk-adjusted payments accrue to the owner. I follow the design of Grasley and Guido (2025) and compare the VI insurer's MA enrollees with rival insurers' MA enrollees who are patients of the VI clinics. A patient belongs to the VI clinics if most of the patient's primary care visit-days are there, assigned once for the pre-period (2017–21) and once for the post-period (2022–23); every year in which the patient has an MA claim counts. The outcome is the CMS-HCC risk score computed from the diagnoses on any claim billed by the VI clinics. I estimate

$$y_{et} = \sum_{k \neq 2019} \beta_k \left(Own_{et} \cdot \mathbf{1}[t = k] \right) + \gamma \, Own_{et} + \alpha_e + \delta_{d(e)t} + \varepsilon_{et}, \tag{2}$$

where y_{et} is patient e's risk score in year t, Own_{et} equals one if patient e is enrolled with the VI insurer in year t, α_e are patient fixed effects, and $\delta_{d(e)t}$ are fixed effects for each main PCP d in each year, so the comparison is between the VI insurer's and rival insurers' enrollees with the same main PCP in the same year; a patient whose main PCP changes is compared, in each year, with that year's PCP's other patients; as in Grasley and Guido (2025), there are no other controls, since the patient fixed effects absorb age and sex up to a common trend. Treatment is defined by patient-year because 18 percent of patients switch between the VI insurer and a rival insurer during the period. Standard errors are clustered by the patient's main PCP at the VI clinics. The

main PCP is the primary care clinician, physician or NP or PA, with the most visit-days at the VI clinics in each window, whether or not that PCP is observed both before and after the acquisition, so the coding sample has more PCPs (98) than the 77 VI-clinic PCPs of the main sample. Because the patient fixed effects absorb the patient's time-invariant risk, β_k measures recorded risk above that risk (Appendix E).

The VI clinics coded the VI insurer's MA enrollees as higher-risk from 2022. Table 6 and Figure 3 compare the VI insurer's enrollees with rival insurers' enrollees at the same clinics. The risk score computed from the diagnoses on the VI clinics' claims rose by 0.041 (standard error 0.015) in 2022–23 relative to 2019, 5 percent of the 2019 mean of 0.760 among the VI insurer's MA enrollees in this sample (Table 1 instead averages over PCPs and all of their patients). The coefficients for 2017, 2018, 2020, and 2021 are all within 0.015 of zero and none is statistically significant, and I cannot reject that the pre-period coefficients are jointly zero ($p = 0.31$). Without the PCP-by-year fixed effects the estimate is 0.043 (standard error 0.014; Table 7, row 2). The jump appears in 2022 and is the same size in 2023.

The rise does not begin when the deal closes. The acquisition closed in 2020, but the clinics' coding of the VI insurer's enrollees did not move significantly in 2021, the first full year of ownership (+0.006). Dating treatment from 2021 instead of 2022 (Table 6, column 1) gives a smaller average, 0.027 (standard error 0.013), because it counts that year as treated, and its pre-period is less flat ($p = 0.08$); the rise starts in 2022.

The increase in the clinics' own coding raises Medicare's payments to the VI insurer. At the county's MA payment rate, an increase of 0.041 in the risk score is worth about $510 to $580 per enrollee a year, or about $1.8 to $2.0 million a year across the VI insurer's roughly 3,500 MA enrollees at the VI clinics in 2022–23.

Are the patients truly sicker? One concern is that the VI insurer's enrollees became sicker. If so, other providers would likely record their new conditions too, and the enrollees would use more care. Neither happens: the risk score from other providers' claims does not move (0.010, standard error 0.022), the clinics' extra codes are mostly conditions that no other provider records that year (Appendix C.2.3), and the enrollees' emergency visits, procedures, imaging, outpatient facility use, and total spending fall or do not change relative to rival insurers' enrollees (Figure 4; Appendix Table 27). The risk score from all claims rises by 0.053 (standard error 0.024); it is not the sum of the two scores, because each condition counts once whichever provider records it, and its confidence interval includes the clinics' 0.041. Comparing only patients of the same age, sex, Medicaid-dual status, and baseline risk, each interacted with year, leaves the estimate unchanged (0.044, standard error 0.015; Appendix Table 23). The extra codes may be real conditions that were previously unrecorded; PCPs often record chronic conditions that no other provider does, and such conditions need little extra care. But the same PCPs did not record more for rival insurers' enrollees, so whether or not the codes are accurate, the added coding follows the owner's payment.

Table 6: The VI insurer's MA enrollees' risk scores at the VI clinics, relative to rival insurers' MA enrollees

	(1) Treatment from 2021	(2) Treatment from 2022
A. Risk score, claims billed by the VI clinics		
VI insurer × Post	0.027**	0.041***
	(0.013)	(0.015)
Mean outcome, VI insurer, 2019	0.761	0.760
R-squared	0.668	0.670
Pre-trend p	0.08	0.31
B. Risk score, all claims		
VI insurer × Post	0.054**	0.053**
	(0.023)	(0.024)
Mean outcome, VI insurer, 2019	1.014	1.012
R-squared	0.702	0.701
Pre-trend p	0.17	0.23
C. Risk score, claims billed by other providers		
VI insurer × Post	0.027	0.010
	(0.022)	(0.022)
Mean outcome, VI insurer, 2019	0.849	0.846
R-squared	0.669	0.668
Pre-trend p	0.47	0.40
Observations (patient-years)	71,140	71,335
Treated patients	5,714	5,702
Control patients	9,105	9,018
PCPs seeing VI-insurer enrollees	97	96
PCPs seeing rival enrollees	98	98
Clusters (PCPs)	98	98

Notes: Patient-level event study at the VI clinics comparing the VI insurer's Medicare Advantage enrollees with rival insurers' Medicare Advantage enrollees. Patients are assigned to the VI clinics in a fixed pre window and a fixed post window by where they have the most primary care visit-days; every year with a Medicare Advantage claim in the window is kept. The outcome is the CMS-HCC (V24) risk score from diagnoses on any claim billed by the VI clinics (Panel A), on all claims (Panel B), or on claims billed by any other provider (Panel C). Treatment is the insurer in each patient-year; every regression includes the VI-insurer main effect, patient fixed effects, and fixed effects for each main PCP in each year, so it compares the VI insurer's and rival insurers' enrollees with the same main PCP in the same year; no other controls. Column (1) dates treatment from 2021, the first full year of ownership; column (2) from 2022. Robustness checks are in Table 7. 2019 is the omitted year. VI insurer × Post is the mean of the post-period event-study coefficients (Figure 3). Treated patients have at least one year with the VI insurer. The pre-trend p tests that all pre-period coefficients are jointly zero. Standard errors clustered by the patient's main PCP in parentheses. Wild cluster bootstrap p-values for VI × Post, clustered by the patient's main PCP (Webb weights, 9,999 replications): 0.028 (column 1) and 0.006 (column 2). $^{*}p<.10$, $^{**}p<.05$, $^{***}p<.01$

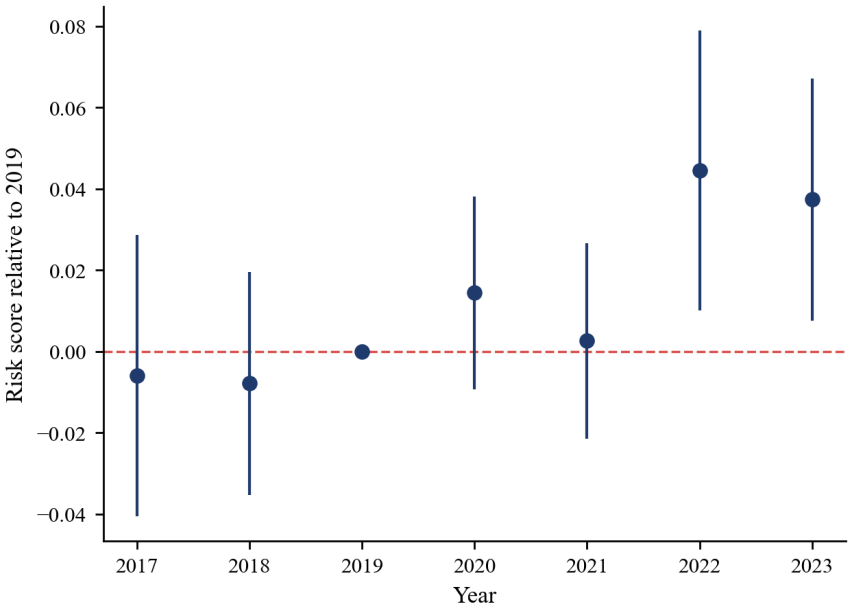


Figure 3: Recorded risk of the VI insurer's MA enrollees at the VI clinics, relative to rival insurers' MA enrollees

Notes: Event study of Equation (2): CMS-HCC risk score (version 24) from diagnoses on claims billed by the VI clinics; all of the VI insurer's MA plans. Patients of the VI clinics, assigned by most primary care visit-days in 2017–21 and in 2022–23; the VI insurer's MA enrollees, by patient-year, relative to rival insurers' MA enrollees. Patient fixed effects and fixed effects for each main PCP in each year. 71,335 patient-years, 14,720 patients, 98 PCPs. 2019 omitted; 95 percent confidence intervals, standard errors clustered by the patient's main PCP.

Is it more contact with the clinics? The VI insurer's enrollees have more annual wellness visits after the acquisition, at which a physician reviews a patient's chronic conditions. But these visits rise from 2020, while the risk score rises only from 2022 (Appendix Table 27). Dropping diagnoses recorded at home, telephone, and virtual encounters, where codes can be added without an in-person exam, gives a similar estimate (0.037; Appendix Table 23).

Is it the same doctors? The effect could come from doctors the clinics hired after the acquisition rather than from a change in how the same doctors code. Keeping only PCPs who were at the VI clinics both before (2017–19) and after (2021–23) the acquisition, with all their patients, gives 0.037 (standard error 0.020), about 90 percent of the headline, and 0.041 (0.019) when age, sex, Medicaid-dual status, and baseline risk, each interacted with year, are added (Appendix Table 23).

Is it switching into the VI insurer? Some patients move from a rival insurer to the VI insurer, and the move itself, rather than the clinics' ownership, could change how they are coded. Patients who are with the same insurer throughout give a similar estimate: 0.040 (standard error 0.017) for patients who never switch insurer and 0.049 (0.023) for those enrolled in the VI insurer's main plan both before and after the acquisition (Appendix Table 23).

Is it a change at the whole clinic? If the VI clinics began coding all of their patients more intensively, rival insurers' enrollees at the clinics would also rise relative to rival insurers' enrollees at independent practices. They rise by 0.023 (standard error 0.020), not significantly (Table 7, row 5), and any such rise would make the estimate conservative. A triple difference that compares the gap between the VI insurer's and rival insurers' enrollees at the VI clinics with the same gap at independent practices gives a similar estimate, though the version against matched practices outside the county is too imprecise to be informative (Appendix Table 23).

Is it the attribution rule? Attributing patients to their most-visited practice each year instead, with the risk score from PCP office claims and added controls and practice fixed effects, gives 0.030 (standard error 0.016; Table 7, row 4), a narrower measure of the same change with the same timing.

Summary of results. The VI clinics record more diagnoses for the VI insurer's MA enrollees from 2022. The coding result has the same sign in every specification I estimate; it is statistically significant in the main comparisons and imprecise in the smaller samples. It is not explained by sicker patients or more contact with the clinics, and it holds among PCPs who were at the clinics both before and after the acquisition. I therefore read the effect as an increase of about 0.041 in the risk score, or 5 percent, in the main comparison, and 0.033 to 0.043 (4 to 6 percent) across rows 1–3 of Table 7, worth about $410 to $607 per enrollee a year in Medicare payments, or about $1.4 to $2.1 million a year across the VI insurer's roughly 3,500 MA enrollees at the VI clinics.

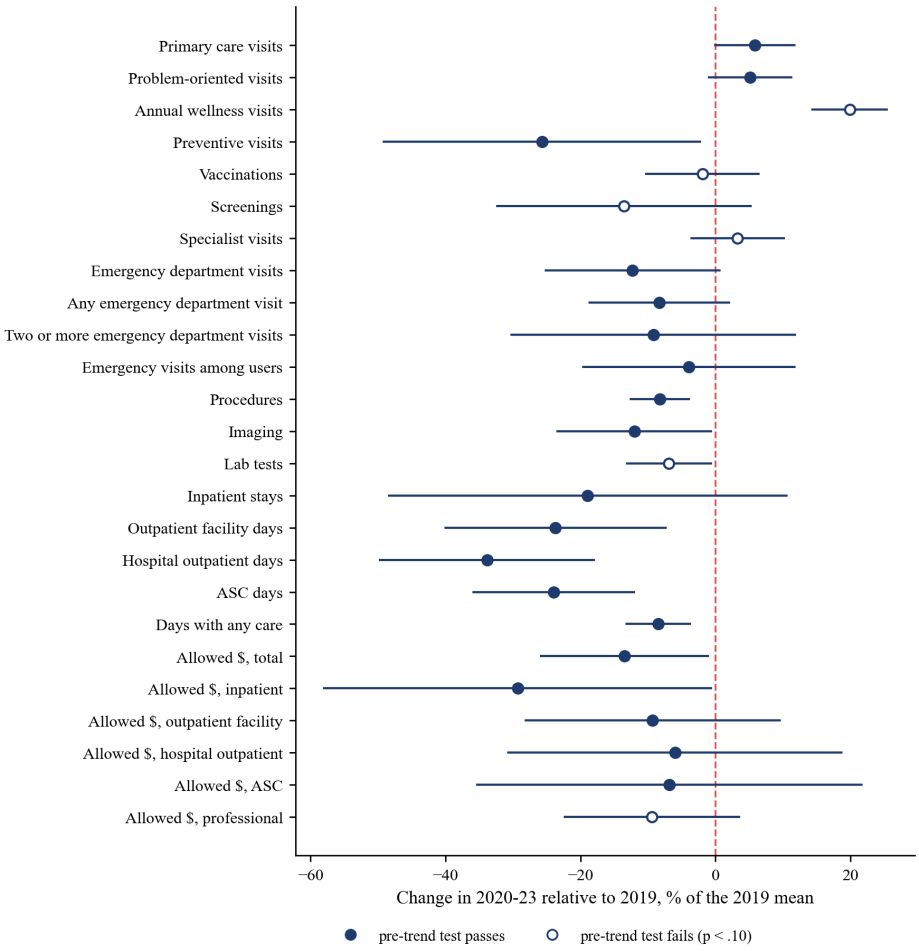


Figure 4: Care received by the VI insurer's MA enrollees at the VI clinics, relative to rival insurers' MA enrollees

Notes: Estimates from Appendix Table 27, column 1: the design of Table 6 with treatment dated from the acquisition (2020), patients observed both before and after it. Change in 2020–23 relative to 2019, as a percent of the VI insurer's enrollees' 2019 mean, with 95 percent confidence intervals. Hollow markers: the pre-trend test fails ($p < 0.10$). Appendix Figure 16 adds two alternative samples. ASC: ambulatory surgery center.

Table 7: Robustness of the coding result

	Claims billed by the VI clinics	All claims	Patient-years	Patients	Clusters (PCPs)
(1) Main specification	0.041***	0.053**	71,335	14,720	98
	(0.015) [0.31]	(0.024) [0.23]			
(2) Without PCP × year fixed effects	0.043***	0.054**	71,351	14,724	102
	(0.014) [0.12]	(0.024) [0.14]			
Insurer fixed effects (replace the VI-insurer main effect):					
(3) All of the VI insurer's MA plans	0.033**	0.046*	71,335	14,720	98
	(0.015) [0.33]	(0.025) [0.36]			
Alternative attribution:					
(4) Annual attribution, PCP office, controls	0.030*	0.027	51,952	13,150	68
	(0.016) [0.31]	(0.027) [0.03]			
Spillover to rival insurers' enrollees:					
(5) Rival enrollees, VI clinics vs. independents	0.023	–	71,138	16,207	178
	(0.020) [0.78]				

Notes: Each row reports VI insurer × Post, the mean of the 2022 and 2023 event-study coefficients relative to 2019, for the VI insurer's Medicare Advantage enrollees relative to rival insurers' Medicare Advantage enrollees at the VI clinics; treatment from 2022. Row (1) is the main specification; row (2) drops its PCP-by-year fixed effects. Row (3) replaces the VI-insurer main effect with a fixed effect for each patient-year's main insurer. Row (4) uses an alternative attribution: patients attributed to their most-visited practice each year, the risk score from primary care office claims, patient, PCP, practice-by-year, and practice-by-VI-insurer fixed effects, and age, sex, insurer, and plan-type controls. Standard errors clustered by the patient's main PCP in parentheses; the p-value of the joint test that all pre-period coefficients are zero in brackets. – = not estimated. Row (5) compares rival insurers' Medicare Advantage enrollees at the VI clinics with rival insurers' Medicare Advantage enrollees at independent practices in the market, with the same design; over 2021–23 the estimate is 0.016 (0.019) [0.84]. Rows (1) and (3) include fixed effects for each main PCP in each year; rows (2), (4), and (5) use patient and year fixed effects. $^{*}p<.10$, $^{**}p<.05$, $^{***}p<.01$

4.4 The VI insurer's own costs

Predictions 3 and 4 concern the VI insurer's own costs: what it pays hospitals, and how often the VI clinics refer its enrollees to specialists. The first is a price, compared across insurers at the same hospital; the second is physician behavior, compared, as for coding, across insurers at the same clinics.

4.4.1 What the VI insurer pays hospitals

A large potential gain from this kind of integration is the downward pressure an insurer that employs PCPs may be able to put on hospital prices when it negotiates with hospitals, although Prediction 3 does not sign it. An insurer that employs the PCPs of many of its enrollees can steer their admissions away from a hospital that holds out for a high price; but each enrollee is also worth more to the integrated firm, which pushes the price the other way. I compare the VI insurer's MA facility prices with rival insurers' prices for the same diagnosis-related group at the same hospital of the dominant local system. For an admission a of patient e, insured by insurer j, at hospital h, in diagnosis-related group q in year t,

$$y_a = \sum_{k \neq 2019} \beta_k \left(VIins_j \cdot \mathbf{1}[t = k] \right) + \delta_{qt} + \delta_{qh} + \delta_{jq} + X'_{et}\lambda + \varepsilon_a, \tag{3}$$

where y_a is the log facility price of the admission, $VIins_j$ equals one for the VI insurer, the fixed effects are for diagnosis-related group by year, diagnosis-related group by hospital, and insurer by diagnosis-related group, and X_{et} holds the patient controls (age, age squared, and sex). Standard errors are clustered by hospital and diagnosis-related group (Table 2). The VI insurer's inpatient facility prices track rival insurers' prices through 2022 (Figure 5): the pooled estimate is -0.8 percent, not statistically significant, with a flat pre-period, and its 95 percent confidence interval excludes a pooled discount larger than about 3 percent. In 2023 the VI insurer's prices fall about 3 percent relative to rival insurers' ($p = 0.11$), in 8 of the 9 diagnosis-related groups with at least 11 admissions in both 2022 and 2023, so the decline is not a change in case mix; coming three years after the acquisition, it could reflect a renegotiated hospital contract or a delayed effect of ownership, and I do not observe when hospital contracts were renewed. In MA, the VI insurer obtains no significant discount despite the VI clinics' patients, whatever their insurer, accounting for about a fifth of the system's admissions in 2019 (23 percent of its MA admissions and 20 percent of its commercial admissions); the share fell after the acquisition, to 15 and 11 percent in 2023. The result holds without the longest stays, with fixed effects for length of stay, and with fixed effects for the treating doctor (-1.5 percent, standard error 1.0; Appendix C.1.3). Hospital outpatient prices do not fall either. I measure them per visit, summing all of a visit's facility lines. Relative to rival insurers' prices for the same procedure at the same hospital, the VI insurer's pooled outpatient estimate is 2.8 percent in MA, not statistically significant, and its prices are about 7 percent higher on average in 2022–23; every year, including 2017, lies above 2019, so the shape of this event study

depends on the base year (Appendix Figure 11).[10]

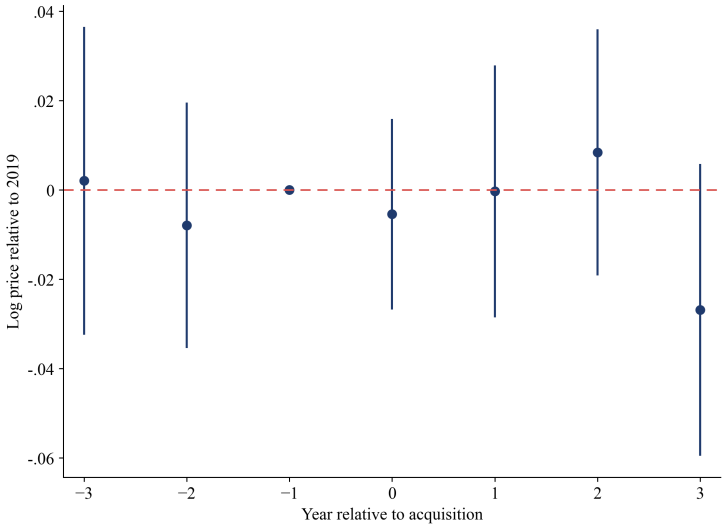


Figure 5: The VI insurer's MA inpatient facility prices at the dominant local hospital system, relative to rival insurers

Notes: Event study of the log facility price per admission, VI insurer's MA admissions minus rival insurers' MA admissions for the same diagnosis-related group at the same hospital. Diagnosis-related-group-by-year, diagnosis-related-group-by-hospital, and insurer-by-diagnosis-related-group fixed effects; patient age, age squared, and sex. 2019 omitted; 95 percent confidence intervals, standard errors clustered by hospital and diagnosis-related group. 19,419 admissions (3,676 of the VI insurer's and 15,743 of rival insurers'), 558 hospital-by-diagnosis-related-group clusters at 4 hospitals. The 2023 coefficient is negative but imprecise ($p = 0.11$).

Appendix Tables 14 and 15 report the full inpatient regressions and every check, with event studies in Figure 9. The hospital comparison holds the hospital and the diagnosis-related group fixed and controls for age and sex, so a change in where the VI insurer's enrollees are admitted, or in the conditions they are admitted for, cannot by itself move the estimate; because it covers all of the VI insurer's MA admissions, it measures the price on the VI insurer's whole MA book at that system.

4.4.2 Gatekeeping

Prediction 4 states that, because the owner pays its enrollees' specialist and hospital bills, the VI clinics refer the VI insurer's enrollees less often.[11] I define a referral as a new-patient visit to a specialist within 90 days of a primary care office visit, excluding dermatology, ophthalmology, podiatry, and allergy, which patients commonly see without a referral; visits that produce no referral

[10]Comparing claim lines rather than visits gives −1.4 percent in MA (standard error 3.5), also not statistically significant. For commercial plans the VI insurer has about 175 admissions at the dominant system over 2017–23, too few for an informative comparison: no event-study coefficient is statistically significant, and the pre-period coefficients lie 0.10 to 0.13 above 2019, so I do not report commercial inpatient prices.

[11]For referrals, the VI insurer's MA enrollees are those in its main MA plan; its second MA plan reports no office visits at the VI clinics before 2020, and its visits are excluded from both the VI insurer's and the rival insurers' samples.

enter at zero. I use the same comparison as for coding: the VI insurer's MA enrollees vs. rival insurers' MA enrollees who are patients of the VI clinics, so the same clinics treat both groups. I assign patients to the VI clinics and to their insurer by their 2018–19 primary care visits and follow all of their primary care office visits in every year, wherever they see a PCP. For a primary care office visit v of patient e in year t,

$$y_v = \sum_{k \neq 2019} \beta_k \left(VIins_e \cdot \mathbf{1}[t = k] \right) + \alpha_e + \delta_{d(v)t} + \gamma \, age_{et} + \varepsilon_v, \tag{4}$$

where y_v equals one if the visit is followed by a referral, $VIins_e$ equals one if the patient's 2018–19 visits were mostly as an enrollee of the VI insurer, α_e are patient fixed effects, and $\delta_{d(v)t}$ are fixed effects for the visit's PCP d in each year, so the comparison is between the VI insurer's and rival insurers' enrollees seen by the same PCP in the same year; the pooled version replaces the year terms with $\beta \left(VIins_e \cdot Post_t \right)$ (Table 2). Standard errors are clustered by the patient's 2018–19 PCP.

After the acquisition, the VI clinics refer the VI insurer's MA enrollees to specialists less often than rival insurers' enrollees. Relative to rival insurers' enrollees, their referral rate falls by 3.6 percentage points over 2021–23 (standard error 0.9), 21 percent of the pre-period rate of 16.9 percent, and by 3.8 points over 2022–23 (standard error 1.2) (Table 8, column 1; Figure 6). The coefficients are negative in every year after the deal. Without the PCP-by-year fixed effects the estimates are −3.6 and −4.0 points.

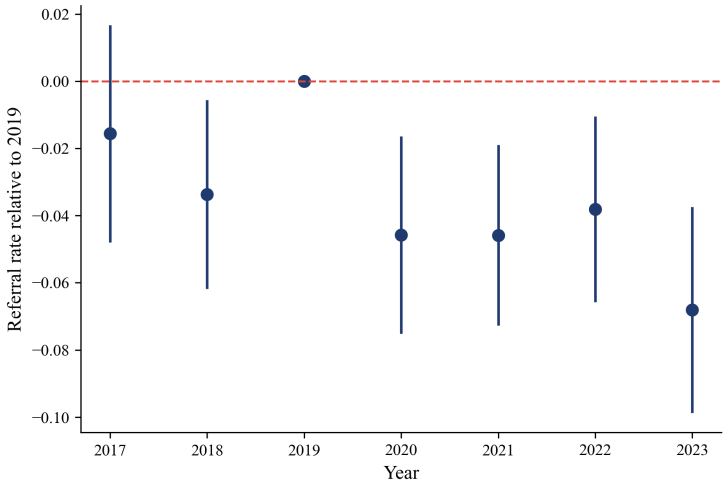


Figure 6: Specialist referrals at the VI clinics: the VI insurer's vs. rival insurers' MA enrollees

Notes: Estimates of Equation (4): patient fixed effects, fixed effects for the visit's PCP in each year, and patient age; patients assigned to the VI clinics and to their insurer by their 2018–19 primary care visits. 156,686 visits (including 2020); 1,295 VI-insurer and 9,698 rival patients; 67 PCP clusters (the patient's 2018–19 PCP). 2019 omitted; 95 percent confidence intervals.

Is it the plans' referral rules? One concern is that which care requires a referral differs across insurance plans, and the main comparison contrasts enrollees of different plans. I therefore also

Table 8: Specialist referrals after the acquisition: the VI insurer's enrollees within the VI clinics, and across clinics

	Within the	Across clinics: VI clinics vs. independent practices			Rival-insurer
	VI clinics (main)	Following doctors	Patients fixed by 2018–19 visits	Triple difference	placebo, across clinics
	(1)	(2)	(3)	(4)	(5)
VI × Post (2021–23)	−0.0355***	−0.0216**	−0.0442***	−0.0453***	−0.0037
	(0.0089)	(0.0102)	(0.0139)	(0.0139)	(0.0066)
VI × Post (2022–23)	−0.0382***	−0.0234**	−0.0477***	−0.0383**	−0.0071
	(0.0116)	(0.0109)	(0.0155)	(0.0162)	(0.0084)
Pre-trend test, p-value	0.068	0.057	0.265	0.068	0.300
Pre-period referral rate, treated group	0.169	0.166	0.169		0.157
Observations (PCP visits)	133,149	54,554	26,206	216,261	123,138
Patients, treated | comparison	1,295 | 9,698	4,980 | 3,810	2,133 (both groups)		8,807 | 6,196
PCP clusters	67	114	105	111	116
Patient FE	Yes	No	Yes	Yes	No
PCP FE	No	Yes	No	No	Yes
PCP × year FE	Yes	No	No	No	No
Year FE	Yes	Yes	Yes	Year × insurer	Yes
Patient controls	Age	Age, sex	Age	Age	Age, sex

Notes: Each observation is a primary care office visit of a Medicare Advantage patient; the outcome is one if the patient has a new-patient visit with a specialist within 90 days, excluding dermatology, ophthalmology, podiatry, and allergy. Column 1 (the main estimate) compares the VI insurer's enrollees with rival insurers' enrollees who are patients of the VI clinics: patients are assigned to the VI clinics and to their insurer by their 2018–19 primary care visits and followed in every year wherever they see a primary care provider; treated patients are the VI insurer's enrollees ("treated | comparison" = VI insurer | rival insurers). Columns 2–5 compare the VI clinics with independent practices in the same county ("treated | comparison" = VI clinics | independent practices). Column 2 follows doctors: a visit is treated if its PCP was ever at the VI clinics. Column 3 follows the VI insurer's enrollees assigned by their 2018–19 visits to the VI clinics or to independent practices. Column 4 is the difference between column 3's estimate for the VI insurer's enrollees and the same estimate for rival insurers' enrollees. Column 5 is column 2 for rival insurers' enrollees. VI × Post compares 2021–23 with 2017–19, leaving out 2020; the second row compares 2022–23 with 2017–19, leaving out 2020 and 2021. The pre-trend test is the joint test that the 2017 and 2018 event-study coefficients, relative to 2019, are zero. Patients in column 1 are counted in the event-study sample. Standard errors clustered by PCP (columns 2 and 5) or by the patient's 2018–19 PCP (columns 1, 3, and 4) in parentheses. Column 1 also includes fixed effects for each PCP in each year (the PCP of the visit), so it compares the VI insurer's and rival insurers' enrollees seen by the same PCP in the same year. Wild cluster bootstrap p-values for column 1, clustered by the patient's 2018–19 PCP (Webb weights, 9,999 replications): < 0.001 (2021–23) and 0.003 (2022–23). $^{*}p<.10$, $^{**}p<.05$, $^{***}p<.01$

compare enrollees of the same VI insurer MA plan who see a PCP at the VI clinics with enrollees of that plan who see a PCP at an independent practice in the county, which holds the plan's rules fixed (Table 8, columns 2–5; Appendix C.2.1). The decline is 2.2 percentage points when following doctors and 4.4 points when patients are fixed to their 2018–19 practice, and rival insurers' enrollees show no change across clinics (−0.4 points), so the acquisition did not spill over to them. Because the VI insurer also capitated several independent clinics from 2022, which gives them some of the same incentives to manage care (Grasley and Guido, 2025), this comparison, if anything, understates the effect of ownership. Separating the plan's special needs enrollees (those in its versions for beneficiaries dually eligible for Medicaid or with certain chronic conditions) from its regular enrollees, or comparing visits for the same presenting complaint, gives similar estimates (Appendix Table 25; Appendix C.2.8).

Is it a pre-existing trend? The main concern is the pre-period, which is not flat (the joint test rejects at the 10 percent level): within the VI clinics, the VI insurer's enrollees' referral rate was 1.6 points lower in 2017 and 3.4 points lower in 2018 than in 2019. In the raw rates, the VI clinics' PCPs were referring the VI insurer's enrollees increasingly often before the deal, from 18.3 percent of visits in 2017 to 21.8 percent in 2019, and the rise stopped at the acquisition: the rate fell to 17.7 percent in 2022–23 (Appendix Figure 18).[12] This pattern has two readings. One is mean reversion: 2019 was an unusually high year and the rate would have fallen back anyway; against the 2017–18 average, the decline is about 2.6 points (15 percent), and I cannot rule this reading out. The other is that the rising trend would have continued and the acquisition broke it; against that trend, measuring from 2019 understates the decline. The headline estimate lies between the two. Comparisons with flat pre-periods point the same way: in the across-clinic comparison with patients fixed to their 2018–19 PCP, the pre-trend tests do not reject, and against matched practices outside the county the decline is 4.0 and 2.9 points with two of the three matches, though not with the third (Appendix D).

Is it who the patients and PCPs are? The headline compares the VI insurer's and rival insurers' patients of the same PCP in the same year, with patients fixed by their 2018–19 visits and followed wherever they go, so patients switching doctors cannot drive it; few changed groups after the acquisition (about 2 percent of later visits). In the across-clinic comparison, dropping the PCPs who switch organizations, keeping only PCPs present throughout, or adding the obstetrician-gynecologists and pediatric practices the main sample omits gives similar estimates (Appendix Table 25).

Where does the care go? Fewer referrals can be good or bad for the VI insurer's enrollees. If the referrals cut were to care of little value, the decline is a saving; if they were to needed care, the enrollees forgo care they should have received, and some of it may return later as emergency or

[12]The raw series counts referrals to every referable specialty, including the four excluded from the regression outcome.

hospital care. The claims cannot tell these apart directly, but forgone needed care would likely push the enrollees toward the emergency department. They do not go there: as the coding results show, these enrollees do not use more care after the acquisition (Section 4.3), and their emergency department use does not rise either. With treatment dated from 2020 and patients observed both before and after the acquisition, the VI insurer's MA enrollees make 0.045 fewer emergency department visits per patient-year than rival insurers' MA enrollees at the VI clinics (standard error 0.024), 12 percent of the 2019 mean of 0.37, with a flat pre-period ($p = 0.82$; Appendix Figure 17). The estimate comes mostly from 2023. Neither the share of enrollees with any emergency department visit (-8.5 percent) nor the share with two or more (-9.5 percent of a 2019 rate of 7.4 percent) changes significantly (Appendix Table 27). Emergency department use therefore does not rise. Nor do their hospital admissions, preventable admissions, or urgent care visits (Appendix C.2.5). This rules out forgone care returning quickly as acute care, not that the forgone referrals were needed: I observe the care patients receive, not their health.

The VI insurer's MA enrollees' total specialist visits do not fall relative to rival insurers' MA enrollees at the same clinics (+3.3 percent, not statistically significant, with a pre-period test that fails; Appendix Table 27). The referral outcome counts only new-patient specialist visits that follow a primary care visit, so the two measures need not move together.

Is it the same in commercial insurance? In commercial insurance I find no evidence of gatekeeping. Within the VI clinics, the VI insurer's commercial enrollees are referred no differently from rival insurers' commercial enrollees after the acquisition (0.007, standard error 0.009, with PCP and year fixed effects), although the pre-period is not flat; almost all of the VI insurer's commercial visits are in fully insured plans. Across clinics, relative to independent practices in the same county, referrals of the VI insurer's commercial enrollees rise by 4 percentage points, with a flat pre-period, while rival insurers' commercial enrollees' referrals do not change (Appendix Table 30 and Figure 20); relative to matched independent practices elsewhere in Oregon, the change is close to zero (-0.3 percentage points; Appendix D), so the increase reflects how the same-county practices' commercial referrals moved.

Summary of results. The VI insurer's MA inpatient prices at the dominant hospital system do not fall relative to rival insurers' (Prediction 3). The direction of the referral estimates is consistent with Prediction 4. After the acquisition the VI clinics refer the VI insurer's MA enrollees to specialists 3.6 percentage points (21 percent) less often than rival insurers' enrollees at the same clinics. Holding the plan fixed, the VI insurer's enrollees are referred 2.2 to 4.4 points less often at the VI clinics than at independent practices, while rival insurers' enrollees show no change across clinics. The decline survives separating special needs enrollees, the presenting complaint, fixing patients to their pre-deal PCP, and two of three out-of-market matches. The pre-period is not flat, however: 2019 is the peak of a rise in the VI clinics' referrals, which may have reverted on its own or been broken by the acquisition, so I read the estimates as evidence of the direction of the

effect more than its size. The enrollees do not make more emergency department visits, and their specialist visits do not fall. In commercial insurance I find no gatekeeping.

4.5 Premiums

Premiums are where the elimination of double marginalization would appear (Prediction 5). Before the acquisition, the VI insurer's premium covered the markup it paid the VI clinics; once it owns them, that price is a transfer within the firm, so if the saving is passed through, its premium falls relative to rival insurers'. In Medicare Advantage, premiums are public. In 2019 the VI insurer's MA enrollees in the county paid an enrollment-weighted $18.6 a month, against $35.0 for rival insurers' enrollees (Appendix Table 19). From 2017–19 to 2021–23 the VI insurer's premium fell by $3.8 a month and rival insurers' fell by $10.3, so the VI insurer's premium fell $6.4 less than rival insurers' (Appendix Table 19), all of it in drug-plan premiums: Part C (medical) premiums fell by about $5 for both groups, while the VI insurer's Part D (drug) premium rose by $1.4 and rival insurers' fell by $5.2[13]. By 2023, 68 percent of both groups' enrollees were in plans with no premium. The VI insurer's MA premiums therefore did not fall relative to rival insurers' after the acquisition. Because most enrollees of both groups are in plans with no premium, a saving could instead reach them through lower cost-sharing. Relative to rival insurers, the VI insurer's plans in the county did not lower copays, the medical deductible, or the out-of-pocket maximum after the acquisition (PCP copay +$1.3, standard error 2.5; specialist copay −$1.0, standard error 3.3). Its drug deductible fell by about $84 a year relative to rival insurers' (standard error 18), starting with plans filed before the acquisition and mostly in 2023, while its drug-plan premium rose relative to rival insurers' (Appendix Table 21). Supplemental benefits, from CMS's plan benefit files, converge rather than diverge: the VI insurer's plans added dental and eyewear coverage, which most rival plans already offered (dental from 17 to 100 percent of enrollees, starting in 2020, a change filed before the acquisition closed), while rival insurers' plans added hearing and over-the-counter benefits, which the VI insurer's plans already offered (Appendix Table 20).

Commercial premiums are observed only statewide and only for fully insured plans, and the VI insurer is a small commercial insurer in Oregon: about 5 to 9 percent of small-group and 4 to 5 percent of large-group enrollment, with essentially no individual-market business. Its statewide premiums show no clear change after the acquisition (Appendix Table 22): its small-group premium per member-month rose in 2021, from $444 to $522, against $451 to $470 for rival insurers, but its claims per member rose about as much, and its approved small-group rate increases in 2021–24 were smaller than the average rival insurer's (−1.1, 1.3, 4.9, and 0.8 percent, against 3.7, 1.9, 6.3, and 7.2 percent). Because these figures cover the whole state, of which the VI clinics are a small part, I do not read them as evidence on the acquisition's effect on premiums. The VI insurer also has too few commercial admissions at the dominant hospital system to measure its commercial inpatient price (footnote 10), so I cannot say whether the acquisition gave it a commercial hospital

[13] An MA plan's premium has two parts. The Part C premium pays for medical coverage: physician, hospital, and outpatient care. The Part D premium pays for prescription drug coverage. Most MA plans include both.

saving to pass on.

The premium comparison is a difference in differences in enrollment-weighted means, but I read it as descriptive. The gap between rival insurers' and the VI insurer's premiums was already narrowing before the acquisition, from $31 a month in 2017 to $16 in 2019, so the pre-period is not parallel, and with one treated insurer offering three to six plans a year, a plan-level regression is too imprecise to be informative (3.8, standard error 16.9). Part of the decline in rival insurers' MA premiums reflects enrollees moving into newly entered zero-premium plans, as the number of rival plans offered rose from about 18 to 29 a year, and the comparison does not adjust for star ratings: CMS rates each MA plan's quality from one to five stars, and plans with higher ratings receive larger rebates, which they can use to lower premiums.

Summary of results. The VI insurer's MA premiums do not fall relative to rival insurers'; of its cost-sharing, only the drug deductible falls, a change that began with plans filed before the acquisition. Its commercial premiums, observed only statewide, show no clear change.

5 Discussion

The largest effects of the VI insurer's ownership of the VI clinics fall on parties outside the firm. Rival insurers pay more for the same visits at the same PCPs, and Medicare pays more for the same patients because the VI clinics record more risk for them, while those patients do not use more hospital, emergency, or specialist care. The effects on the owner's own costs are smaller: its enrollees are referred to specialists less often, with pre-trends that make the size hard to pin down, and they do not make more emergency department visits. The price and coding effects appear in 2022. Prices may change only when contracts are renegotiated at expiry, and changing how PCPs code may take time, as the owner puts in place the staff and systems that support it. Existing theory explains why the channels run in these directions: each is a margin the VI pair controls, and part of each one's cost falls on someone outside the pair.

Why the owner gets no discount. The standard efficiency argument for vertical integration is the elimination of double marginalization: once the insurer owns the practice, it no longer pays the practice a markup. In an integrated firm that price is a transfer, so the saving would reach enrollees through premiums, and the VI insurer's Medicare Advantage premiums did not fall relative to rival insurers' (Section 4.5). Two possible reasons explain this. First, ownership removes the practice's markup from the firm's costs, but nothing requires the firm to pass that saving on to enrollees. The internal price itself is a transfer: it changes neither the firm's profit nor the physicians' incentives, except under the medical loss ratio rules that cap the share of premiums an insurer may keep: payments to an owned practice count as medical spending under those rules, so a higher internal price lets the firm keep more of its premiums. Second, the larger potential gain, lower hospital prices from a credible threat to steer the employed PCPs' patients, requires a threat the VI insurer could not easily make: one hospital system has about three quarters of inpatient admissions in the

market. Its Medicare Advantage inpatient prices at the dominant hospital system do not change significantly relative to rival insurers' prices for the same admission, despite the VI clinics' patients accounting for about a fifth of that system's admissions before the acquisition. This is what the bargaining framework predicts when there are few alternatives to send patients to: an insurer's threat to steer enrollees away from a hospital lowers that hospital's price only if hospitals compete (Ho and Lee, 2019), while the higher value of each enrollee to the integrated firm pushes the price up, so the two forces can offset, and the price effects of physician–hospital integration are largest where physicians had alternatives (Cooper et al., 2025).

Other routes to gains for enrollees are only partly measured: commercial premiums are available only statewide, and in MA the only cost-sharing term that fell relative to rival insurers' is the VI insurer's drug deductible, a change that began with plans filed before the acquisition, as its drug-plan premium rose (Section 4.5). The claims also do not record gains in coordination or quality. The absence of a discount in the prices I observe gives no evidence of the most direct source of efficiency gains, not of every possible one. These estimates are countervailing forces, not a net verdict: the owner gains from rivals' higher prices and Medicare's higher payments and saves little on its own costs, but a change in quality of care, which I do not observe, could outweigh all of them.

Who pays. Rival insurers pay about 13 percent more for an office visit at the VI clinics starting in 2022, about $38 per visit at their 2019 price, or roughly $0.35 million a year for this visit type alone and $0.73 million across all established-patient office visits at their rival commercial volume. They may pass part of this on to their enrollees and to the employers that buy coverage from them, including self-funded employers whose plans they administer. Medicare bears the cost of coding: a risk-score increase of 0.041, about 5 percent of the mean, raises CMS's payment for each affected enrollee by about $510 to $580 a year, the extra Medicare payment from the clinics' own coding; across the VI insurer's roughly 3,500 MA enrollees at the VI clinics, about $1.8 to $2.0 million a year (approximating CMS's payment as the risk score times the county rate, including the quality bonus, $1,036 to $1,177 per enrollee-month in 2022–23). Because CMS's coding-intensity adjustment deducts the same share from every plan, coding that rises at one insurer's owned practices raises that insurer's payments relative to plans whose physicians code as before. By a back-of-the-envelope calculation, the fall in referrals saves the VI insurer about $360,000 a year: about 220 fewer referrals a year, or about $130 a year per patient with a PCP visit (95 percent interval $70 to $200), if the forgone referral episodes are not replaced by other specialist care; the enrollees' total specialist visits do not fall (Section 4.4.2), so this is an upper bound.[14] The referral result is the least certain of the estimated effects, and it is the main one that lowers the VI insurer's costs. Fewer referrals may mean less unnecessary care or less needed care, and, as Section 4.4.2

[14]The within-clinic estimate (3.6 percentage points) times about 6,300 office visits a year by the VI insurer's MA enrollees at the VI clinics gives about 220 referrals; at about $1,600, the average allowed spending on a referral episode in 2017–19 (the specialist's claims for the patient in the 180 days after the first visit, plus facility claims for procedures), this is about $360,000 a year, or about $130 for each of the about 2,700 enrollees with a PCP visit. The interval applies the estimate's 95 percent confidence interval.

shows, the claims cannot tell which. If the decline reflects mean reversion rather than a change in referral behavior, the remaining effects are payments from rival insurers and Medicare to the integrated firm.

How far the results extend. Two features of this acquisition matter for how far the results extend. The acquired chain was the largest group of PCPs in the market, and I do not observe any rival insurer dropping it from its network, even after the price increase, so the bargaining incentive showed up as higher prices rather than exclusion; the effect should grow with the share of rival insurers' enrollees who would follow their physician to the VI insurer. The VI insurer had a large MA business in the market, so many of the clinics' patients were its enrollees.

How typical is the market? The estimates come from one acquisition in one market, so whether they generalize depends on how the market compares with other U.S. markets (Table 9). On the provider side it is typical. Two health systems provide nearly all inpatient care in the area, the larger with 77 percent of discharges. The market's hospital HHI, 6,443, is close to that of the median U.S. metropolitan area, 5,401, and like 97 percent of metropolitan areas it is highly concentrated (KFF, 2024). The county has 82 primary care physicians per 100,000 residents, against 81 in the median county of similar size (County Health Rankings and Roadmaps, 2025). On the insurer side it is not typical. Its commercial insurance market is among the least concentrated in the country: an HHI of 1,702 in 2017 and 1,974 in 2024 (metro-area figures, lower than the 2019 state enrollment figure in Section 2), against medians of about 3,200, with no insurer above a third of enrollment (American Medical Association, 2018, 2024). Medicare Advantage enrollment is unusually high: 55 percent of Medicare beneficiaries in 2020 and 60 percent in 2022, against medians of 43 and 49 percent in counties with at least 60,000 Medicare-eligible residents (Centers for Medicare & Medicaid Services, 2022).

The size of both the price and the coding effects may depend on these atypical features. The coding gain per enrollee need not depend on the market; the total gain scales with the number of the VI insurer's MA enrollees its PCPs see, which depends on the market's size as well as its MA enrollment. The price increase rival insurers face depends on their bargaining position; here the rivals are many and small, and existing theory does not sign how the effect changes in a market with fewer, larger insurers. The results therefore describe a market with typical hospital and physician concentration, fragmented commercial insurers, and high MA enrollment.

6 Conclusion

Insurers have moved rapidly into the ownership of physician practices. Practices owned by the largest insurers delivered 4.2 percent of primary care services to Medicare beneficiaries in 2023, up from 0.78 percent in 2016 (Adler et al., 2025). These transactions combine firms that do not compete with each other, and they have received little scrutiny from antitrust authorities. Yet they place one firm on both sides of the market: the insurer buys care for its own enrollees from

Table 9: The VI clinics' market compared with U.S. markets

	VI clinics' market	U.S. median	Percentile
Providers			
Hospital HHI (inpatient discharges, 2024)	6,443	5,401	63
Largest system's share of discharges (2024)	77%	66%	
Primary care physicians per 100,000 (2021)	82	81	54
Insurers			
Commercial insurer HHI (2017)	1,702	3,199	3
Commercial insurer HHI (2024)	1,974	3,236	7
Largest commercial insurer's share (2024)	32%	49%	
MA share of Medicare beneficiaries (2020)	55%	43%	84
MA share of Medicare beneficiaries (2022)	60%	49%	83
MA insurer HHI (2024)	3,146	2,859	65

Notes: Hospital rows: KFF (2024), metropolitan areas ($n = 387$). Primary care physicians: County Health Rankings and Roadmaps (2025) (2021 physician data), counties with at least 250,000 residents. Commercial and MA insurer concentration: American Medical Association (2018, 2024), metropolitan areas. MA share: Centers for Medicare & Medicaid Services (2022), counties with at least 60,000 Medicare-eligible residents. Percentile is the share of areas with a lower value; medians and percentiles are my calculations from each source's area-level data.

physicians who also sell care to rival insurers and who record the diagnoses on which the insurer's Medicare payments depend.

To examine the effects of integration between insurers and physicians, I use one such acquisition as a case study to investigate how ownership changes an insurer's and its physicians' incentives, using all-payer claims that observe every insurer's prices and patients at the same PCPs before and after the deal. I examine five mechanisms. Existing theory signs three of them: rival insurers pay the owned practice more (Prediction 1), and its physicians record more diagnoses for the owner's enrollees (Prediction 2) and refer them to costly care less often (Prediction 4). It leaves two unsigned: the prices the owner pays hospitals can rise or fall (Prediction 3), and its premiums fall only if its costs fall and it passes the saving on (Prediction 5). I find clear evidence for Predictions 1 and 2, weaker evidence for Prediction 4, and no lower Medicare Advantage hospital prices or premiums for the owner. Rival insurers' commercial prices for an office visit at the acquired clinics rise by about 13 percent after the acquisition, while their Medicare Advantage prices, measured against each contract's Medicare fee schedule, rise by about 2 percent on average. From 2022, the risk scores of the owner's Medicare Advantage enrollees rise by about 5 percent relative to rival enrollees at the same clinics, while diagnoses recorded by every other provider do not change. The owner's enrollees are referred to specialists about 21 percent less often than rival insurers' enrollees at the same clinics after the deal, a decline that reverses a rise already under way before it, and they do not make more emergency department visits. The integrated firm's measured gains come mostly from rival insurers and from Medicare; any savings from fewer referrals do not reach its Medicare Advantage enrollees as lower premiums.

These findings matter for merger enforcement, for Medicare Advantage payment, and for the Senate bills that would ban insurer ownership of physician practices (U.S. Senate, 2025, 2026): they show where the costs of such ownership fall, which a ban must weigh against efficiency gains I cannot

measure. The higher prices rival insurers pay are the classic vertical concern, raising rivals' costs, which the 2023 Merger Guidelines now address explicitly (U.S. Department of Justice and Federal Trade Commission, 2023, Guideline 5). It appears in a transaction with no horizontal overlap, and it becomes visible only when contract rates change. Retrospective reviews that measure prices soon after a deal would miss it. The coding result shows that employing physicians is a direct route to higher risk-adjusted payments, and that a uniform coding-intensity adjustment, which reduces payments to every plan by the same share, does not reach it. Because the extra diagnoses come mainly from the owned practice, rules that audit or discount diagnoses recorded by a plan's own affiliated physicians would.

This paper studies one acquisition, and the mechanisms I identify are most relevant where the acquired chain is large relative to the local market and the acquirer has a large Medicare Advantage business. The analysis takes networks as given, and the claims do not record the payments that flow within the integrated firm, so I cannot measure how much of the rival insurers' higher costs reaches their enrollees or where within the firm the gains are kept. I observe the care patients receive but not their health. Several directions seem promising. This paper explains in words why an insurer that employs PCPs could bargain hospital prices down, through its PCPs' ability to steer referrals among in-network hospitals; a model in which referrals respond to hospital prices would show this channel formally. Linking acquisitions to Medicare Advantage plan bids, and to commercial premium filings, would show who ultimately pays. Following more practices that an insurer capitates without owning them, over more years, would show how much of the coding response requires ownership. And as insurer-owned practices spread across many markets at once, understanding how ownership in one market changes an insurer's bargaining in others will be needed to judge the full effect of this wave of integration.

References

Loren Adler, S. Crow, Matthew Fiedler, Richard G. Frank, R. Fernandez, D. Lake, and R. T. Braun. The changing landscape of primary care: An analysis of payer–primary care integration. *Health Affairs Scholar*, 3(7):qxaf120, 2025. doi: 10.1093/haschl/qxaf120.

American Medical Association. Competition in health insurance: A comprehensive study of U.S. markets. Technical report, American Medical Association, 2018. 2018 update, data as of February 1, 2017.

American Medical Association. Competition in health insurance: A comprehensive study of U.S. markets. Technical report, American Medical Association, 2024. 24th edition, data as of January 1, 2024.

Gerard F. Anderson, Uwe E. Reinhardt, Peter S. Hussey, and Varduhi Petrosyan. It's the prices, stupid: Why the United States is so different from other countries. *Health Affairs*, 22(3):89–105, 2003.

Laurence C. Baker, M. Kate Bundorf, and Daniel P. Kessler. Vertical integration: Hospital ownership of physician practices is associated with higher prices and spending. *Health Affairs*, 33(5): 756–763, 2014.

Laurence C. Baker, M. Kate Bundorf, and Daniel P. Kessler. The effect of hospital/physician integration on hospital choice. *Journal of Health Economics*, 50:1–8, 2016.

Cory Capps, David Dranove, and Christopher Ody. The effect of hospital acquisitions of physician practices on prices and spending. *Journal of Health Economics*, 59:139–152, 2018.

Centers for Medicare & Medicaid Services. 42 CFR 414.80: Incentive payment for primary care services. https://www.law.cornell.edu/cfr/text/42/414.80, 2010. Code of Federal Regulations, implementing Section 1833(x) of the Social Security Act.

Centers for Medicare & Medicaid Services. Medicare Advantage state/county penetration. March 2020 and March 2022 files, 2022.

Centers for Medicare & Medicaid Services. National health expenditures 2023 highlights. National Health Expenditure Accounts, https://www.cms.gov/files/document/highlights.pdf, 2024.

Hyein Cho. Provider-insurer integration and healthcare delivery. Job Market Paper, 2025.

Zack Cooper, Stuart V. Craig, Martin Gaynor, and John Van Reenen. The price ain't right? Hospital prices and health spending on the privately insured. *Quarterly Journal of Economics*, 134(1):51–107, 2019.

Zack Cooper, Stuart V. Craig, Aristotelis Epanomeritakis, Matthew Grennan, Joseph R. Martinez, Fiona Scott Morton, and Ashley T. Swanson. Are hospital acquisitions of physician practices anticompetitive? NBER Working Paper 34039, National Bureau of Economic Research, July 2025.

County Health Rankings and Roadmaps. County health rankings 2025 analytic data. University of Wisconsin Population Health Institute, 2025.

José Ignacio Cuesta, Carlos Noton, and Benjamin Vatter. Vertical integration and plan design in healthcare markets. NBER Working Paper 32833, National Bureau of Economic Research, 2024.

Amy Finkelstein, Matthew Gentzkow, and Heidi Williams. Sources of geographic variation in health care: Evidence from patient migration. *Quarterly Journal of Economics*, 131(4):1681–1726, 2016.

Michael Geruso and Timothy Layton. Upcoding: Evidence from Medicare on squishy risk adjustment. *Journal of Political Economy*, 128(3):984–1026, 2020.

Gautam Gowrisankaran, Aviv Nevo, and Robert Town. Mergers when prices are negotiated: Evidence from the hospital industry. *American Economic Review*, 105(1):172–203, 2015.

Nick Grasley and Mariana Guido. Aligning incentives or gaming the system? The impact of insurer–physician acquisitions. Working paper, Stanford University, 2025.

Sanford J. Grossman and Oliver D. Hart. The costs and benefits of ownership: A theory of vertical and lateral integration. *Journal of Political Economy*, 94(4):691–719, 1986.

Kate Ho and Robin S. Lee. Insurer competition in health care markets. *Econometrica*, 85(2): 379–417, 2017.

Kate Ho and Robin S. Lee. Equilibrium provider networks: Bargaining and exclusion in health care markets. *American Economic Review*, 109(2):473–522, 2019. doi: 10.1257/aer.20171288.

Kate Ho and Ariel Pakes. Hospital choices, hospital prices, and financial incentives to physicians. *American Economic Review*, 104(12):3841–3884, 2014.

KFF. One or two health systems controlled the entire market for inpatient hospital care in nearly half of metropolitan areas. KFF analysis of health system market shares, 2024 discharges, 2024.

Thomas G. Koch, Brett W. Wendling, and Nathan E. Wilson. How vertical integration affects the quantity and cost of care for Medicare beneficiaries. *Journal of Health Economics*, 52:19–32, 2017.

James G. MacKinnon and Matthew D. Webb. Wild bootstrap inference for wildly different cluster sizes. *Journal of Applied Econometrics*, 32(2):233–254, 2017. doi: 10.1002/jae.2508.

Jeffrey Marr, Christopher M. Whaley, and Xiaoxi Zhao. From payer to provider: Impacts of insurer vertical expansion into physician services. Working paper, Brown University, 2026.

Hannah T. Neprash, Michael E. Chernew, Andrew L. Hicks, Teresa Gibson, and J. Michael McWilliams. Association of financial integration between physicians and hospitals with commercial health care prices. *JAMA Internal Medicine*, 175(12):1932–1939, 2015.

OECD. *Health at a Glance 2025: OECD Indicators*. OECD Publishing, Paris, 2025. doi: 10.1787/8f9e3f98-en.

Janusz A. Ordover, Garth Saloner, and Steven C. Salop. Equilibrium vertical foreclosure. *American Economic Review*, 80(1):127–142, 1990.

Oregon Health Authority. Oregon administrative rules, chapter 409, division 25: All payer all claims data reporting program. https://www.oregon.gov/oha/HPA/HPARules/409-025%20Web%20Full%20Text%20-%20Eff%201-1-20.pdf, 2020. OAR 409-025-0100, definitions of "capitated services" and "prepaid amount".

Oregon Health Authority. Oregon administrative rules 409-027-0015: Definitions, primary care services reporting. https://secure.sos.state.or.us/oard/view.action?ruleNumber=409-027-0015, 2026. Accessed October 18, 2026.

Irene Papanicolas, Liana R. Woskie, and Ashish K. Jha. Health care spending in the United States and other high-income countries. *JAMA*, 319(10):1024–1039, 2018.

Physicians Advocacy Institute and Avalere Health. Physician employment and practice ownership trends 2019–2023. Technical report, Physicians Advocacy Institute, 2024.

Elena Prager. Health care demand under simple prices: Evidence from tiered hospital networks. *American Economic Journal: Applied Economics*, 12(4):196–223, 2020. doi: 10.1257/app.20180422.

Ashesh Rambachan and Jonathan Roth. A more credible approach to parallel trends. *Review of Economic Studies*, 90(5):2555–2591, 2023. doi: 10.1093/restud/rdad018.

Patrick Rey and Jean Tirole. A primer on foreclosure. In Mark Armstrong and Robert Porter, editors, *Handbook of Industrial Organization*, volume 3, chapter 33, pages 2145–2220. North-Holland, Amsterdam, 2007.

Joseph J. Spengler. Vertical integration and antitrust policy. *Journal of Political Economy*, 58(4):347–352, 1950.

Steven Tadelis. Transaction cost economics. In Robert Gibbons and John Roberts, editors, *The Handbook of Organizational Economics*, pages 159–190. Princeton University Press, 2013.

Erin Trish, Paul Ginsburg, Laura Gascue, and Geoffrey Joyce. Physician reimbursement in Medicare Advantage compared with traditional Medicare and commercial health insurance. *JAMA Internal Medicine*, 177(9):1287–1295, 2017. doi: 10.1001/jamainternmed.2017.2679.

U.S. Department of Justice and Federal Trade Commission. Merger guidelines. https://www.justice.gov/atr/2023-merger-guidelines, December 2023.

U.S. Senate. Patients Over Profit Act, S. 2836, 119th Congress. https://www.govinfo.gov/app/details/BILLS-119s2836is, September 2025. Introduced by Sen. Merkley, with Sens. Warren and Markey.

U.S. Senate. Break Up Big Medicine Act, S. 3822, 119th Congress. https://www.govinfo.gov/app/details/BILLS-119s3822is, February 2026. Introduced by Sen. Warren and Sen. Hawley.

Carl van Walraven, Peter C. Austin, Alison Jennings, Hude Quan, and Alan J. Forster. A modification of the Elixhauser comorbidity measures into a point system for hospital death using administrative data. *Medical Care*, 47(6):626–633, 2009.

Oliver E. Williamson. The vertical integration of production: Market failure considerations. *American Economic Review*, 61(2):112–123, 1971.

A Identifying PCPs

Classification features. Because a generalist taxonomy does not guarantee that a clinician practices primary care, and NPs and PAs work in both primary and specialty care, I classify each remaining clinician from three features of their claims. The first is the services they bill: primary care consists mostly of office and preventive visits, whereas a clinician whose billing is dominated by procedures, therapy sessions, or hospital, emergency, or nursing-facility visits is not practicing primary care. The second is the breadth of their patients' diagnoses: a primary care provider treats a wide range of conditions, while a specialist's patients are concentrated in a few diagnosis groups. The third is the organization they bill under: a clinician who works at a clearly specialized clinic, such as an orthopedic, urology, or pain practice, is dropped, and one who works at a clearly primary care group is kept. The same features override a generalist taxonomy: a clinician whose visits are mostly in emergency, inpatient, critical care, nursing-facility, or urgent care settings, who works in a niche practice (hormone therapy, medical spa, addiction, ADHD, occupational, hospice, fertility, wound, sleep, or memory care), or who bills too little to classify is not counted as a primary care provider. I classify each clinician separately in each year, as a primary care provider, not a primary care provider, or unclear, because clinicians change roles over time. Because many family physicians run practices whose names suggest something else (a "wellness" or "integrative" clinic, for example), I use the organization only when its specialty is unambiguous, and I verify the remaining cases individually against public provider directories.

The statewide universe. I build a directory of every physician, nurse practitioner, and physician assistant who renders care in the state's claims between 2017 and 2023, 18,424 clinicians in all, and classify each clinician in each year as a primary care provider, not a primary care provider, or

unclear. A physician whose taxonomy in the National Plan and Provider Enumeration System is a specialty is not a primary care provider. Physicians with a generalist taxonomy (family medicine, including adult and geriatric family medicine; internal medicine, including geriatric internal medicine; general practice; pediatrics; and obstetrics and gynecology) and nurse practitioners and physician assistants are classified from their claims. A clinician is not a primary care provider in a year if emergency department visits make up at least 40 percent of their evaluation-and-management visits, inpatient visits at least 50 percent, critical care at least 15 percent, nursing-facility visits at least 50 percent, or home visits at least 50 percent; if at least half of their lines are at an urgent care organization or place of service; or if at least 40 percent of their units are psychiatric or behavioral services or physical therapy, or at least 30 percent anesthesia. Nurse practitioners and physician assistants with fewer than 100 claim lines in a year are not classified; those whose billing is concentrated in one procedure family or in surgical and post-operative services are assigned to that specialty; and those who bill mostly evaluation-and-management visits with at least 40 percent of their visits in one diagnosis chapter are assigned to the corresponding specialty, while a spread of diagnoses, with preventive codes among the most common, indicates primary care. Clinicians in niche practices (hormone therapy, medical spa, addiction, ADHD, occupational, hospice, fertility, wound, sleep, or memory care) and clinicians whose main billing organization is plainly a specialty group are not primary care providers in that year. Labels verified by hand against public provider directories override these rules. In all, 6,851 clinicians are primary care providers in at least one year, and 31,531 of 95,594 clinician-years are classified as primary care.

The analysis sample. The analysis sample is a hand-audited list of PCPs in the VI clinics' market. It starts from the 454 clinicians on the primary care rosters used in earlier analyses of this market, each built from the VI clinics' billing records and a regional provider roster. I drop clinicians whose billing is dominated by psychotherapy or who have almost no claims (10), psychiatric nurse practitioners identified by their taxonomy (3), and clinicians whose billing organization or individually verified practice is a specialty (3), as well as clinicians who practice only at hospital systems (102). I keep clinicians observed both before 2020 and from 2020 on, which leaves 249. I then classify each remaining clinician-year by the organization the clinician bills under that year and drop clinician-years at hospital systems (184), an integrated delivery system (12), university health services (115), single-specialty practices (51), and other institutions (9), together with clinicians whose identity cannot be verified or whose records are individually investigated and found to be errors. Requiring a clean year before 2020 and a clean year from 2020 on leaves 173 clinicians and 1,029 clinician-years. A clinician-year belongs to the VI clinics if the clinician bills under the VI clinics that year and to the control group otherwise. Finally, I keep control clinician-years only at independent primary care practices in the county, which removes 313 of 586 control clinician-years, mostly at a private-equity-owned urgent care chain and the county health center. The final sample has 77 PCPs at the VI clinics and 54 at independent practices. Appendix C.3.1 reports the results with the clinicians the statewide directory identifies in the same market but this list omits.

Table 10: Sample construction

	PCPs	PCP-years
PCPs on earlier rosters of the market	454	
After rule-based screens (billing, taxonomy, specialty, hospital systems, presence before 2020 and from 2020 on)	249	1,536
After the manual audit (identity, organization by year, clean years before 2020 and from 2020 on)	173	1,029
VI clinics (billing under the VI clinics that year)	77	443
Control group, before the independent-practice rule	102	586
Control group, independent practices only (final)	54	273
Final sample by year, VI clinics / independent practices		
2017: 63 / 37; 2018: 67 / 44; 2019: 74 / 47; 2020: 73 / 45; 2021: 64 / 38; 2022: 53 / 34; 2023: 49 / 28		

Notes: Six PCPs bill under the VI clinics in some years and under another organization in others. The independent-practice rule removes control PCP-years at a private-equity-owned urgent care chain (127), the county health center (42), and other practices that are not independent primary care practices in the county; 48 of the 102 control PCPs lose every year. PCP-years for the first step are not counted separately because the screens were applied to clinicians.

B Data Construction

B.1 Claims and cleaning

I use the Oregon All Payer All Claims database for 2017–23, medical claims only. I combine one insurer that reports under two codes. One rival MA insurer's claims reporting collapses in 2020, so I exclude it wherever a comparison needs the same insurers before and after the acquisition (the referral placebo and the all-rival MA price estimate); one small rival MA insurer has almost no visits at the VI clinics after 2019 and is excluded from the all-rival MA estimate for the same reason. The VI insurer's MA health maintenance organization (HMO) plan stops reporting the VI clinics' claims in 2022, so I never use that plan's volumes after 2021. When a line's billing organization is blank, I fill it from another line of the same claim and, failing that, from the clinician's only billing organization that year; lines that remain blank are dropped. Two rival insurers keep a clinician's former billing organization on their claims after the clinician moves and price the clinician at the clinician's main clinic rate, so for these insurers I assign each line to the clinician's main clinic that year.

B.2 Prices

A price is the allowed amount on a claim line: the total the insurer and the patient together pay the provider. Each restriction below makes a price the contracted price of one unit of the same service in the same setting.

- *Office visits only* (place of service 11). In MA, telehealth visits are priced 20 to 30 percent below office visits, and hospital-based visits are billed on a different schedule.
- *One unit.* Lines with more than one unit are priced per line, not per unit.

- *In network.* Out-of-network lines are not priced under the contract. One rival commercial insurer reports its in-network lines under a different network code from October 2017, which I treat as in network.
- *Primary payer.* In MA, I drop lines marked as secondary coverage, which carry a reduced secondary allowed amount, and when two MA plans price the same visit I keep the higher-priced line, so each visit is priced once at the primary plan's contract. In commercial insurance, two insurers on the same visit each record their own contract price, so I keep both.
- *Positive allowed amount, reversals removed.* Lines with no allowed amount are denials or administrative copies, and reversed lines cancel earlier claims.
- *One line per clinician, patient, date, procedure, and insurer*, so that a visit is not counted more than once.
- *Every modifier kept*, with insurer-by-modifier fixed effects. Dropping modified lines would remove visits selectively: at one group of hospital-employed physicians, the no-modifier rule alone removes most of a year's commercial visits.
- *Capitated lines kept.* On a capitated line, the allowed amount is the contract price, and the rival insurer that capitates the VI clinics prices capitated and fee-for-service lines on the same schedule. I never use the paid amount as a price.
- *The VI insurer's self-funded employer plans excluded*, because the subsidiary that administers them reports under its own code and prices on its own schedule.
- *Rival commercial insurers with enough lines*: at least 200 lines at both the VI clinics and the independent practices before and after 2021, so that each insurer's price path is estimated from both sides.
- *Credential.* Rival insurers pay nurse practitioners and physician assistants about 85 percent of the physician rate in MA, so every comparison holds the credential fixed. I identify nurse practitioners and physician assistants from their registry taxonomy, because the credential field on claims does not flag them reliably.

Together these restrictions drop 8 percent of the VI clinics' commercial lines and 16 percent of independent practices' lines (9 and 15 percent in MA). The biggest line losses come from the office-setting, positive-allowed-amount, and one-line-per-service rules, though no single rule removes more than 6 percent of lines. The biggest patient losses come from the office-setting rule and, for commercial claims, from excluding the VI insurer's self-funded employer plans.

B.3 Payment type and capitation

The claims record a payment type from 2022 on. The field means different things for different insurers. For the rival insurer that capitates the VI clinics in MA, a capitated line is paid $0 and its allowed amount is the contract price. The VI insurer labels about three quarters of its office-visit lines at the VI clinics as capitated in 2022–23 but pays them at 97 to 100 percent of the allowed amount, so for the VI insurer the label marks a contract type rather than an absence of per-visit payment. From 2023 the VI insurer's claims also carry a $0 copy of each such line, which I count

once.

B.4 Markets, ownership, and the control group

A clinician belongs to the VI clinics' county in a year if most of the clinician's claims that year are billed there and most of the clinician's patients that year live there; reported addresses are often out of date, and practices with sites in several markets bill every site under one organization. Each clinician-year is assigned to the organization the clinician bills under that year and each organization to its owner, so a clinician who joins or leaves the VI clinics is classified accordingly in each year. A control practice is independent unless there is evidence of ownership by a hospital or health system, an insurer, a private equity firm, or an integrated delivery system, from state business registrations, the practice's own statements, or acquisition announcements; a hospital system's provider directory listing, hospital privileges, or membership in an accountable care organization is affiliation, not ownership, and a network or capitation contract with an insurer is a contract, not ownership. Federally qualified and community health centers are excluded from the controls, because they are paid on different schedules, as is one staffing organization that places nurse practitioners in chiropractic and integrative clinics. Clinicians at private-equity-owned urgent care chains and the county health center are excluded, because they do not provide ongoing primary care or are not independently owned; including the county health center's clinicians leaves every estimate unchanged to two decimal places, because the center bills few office visits. Single-clinician practices stay in the control group: in the model they are independent clinics like any other.

B.5 Outcomes

Attribution. For coding, each MA patient is assigned to a practice twice, once for 2017–21 and once for 2022–23: the billing organization with the most primary care visit-days in that window, with ties broken by allowed amount. Every year in the window with an MA claim counts. The checks on the enrollees' use of care (Section 4.3) use the same assignment with windows 2017–19 and 2020–23.

Risk scores. I compute the CMS-HCC risk score (version 24) each year from the diagnoses on the patient's claims in three ways: from any face-to-face claim billed by the VI clinics, by any of their clinicians and in any setting (the main outcome, because these are the diagnoses the practice records), from all claims (the score CMS pays on), and from claims by every other provider (a placebo).

Referrals. A primary care office visit is followed by a referral if the patient has a new-patient visit with a specialist within 90 days. Dermatology, ophthalmology, podiatry, and allergy are excluded, because patients commonly see them without a referral. Figure 7 shows why I use a 90-day window. Among new-patient specialist visits preceded by a PCP visit within a year, the share that falls within 90 days of that visit is about two thirds to three quarters, and each additional 30 days adds progressively less (about 9 to 13 percentage points from 60 to 90 days, 3 to 5 points from

150 to 180 days). The curves have the same shape at the VI clinics and at independent practices. After 2020 the gaps lengthen for both groups.

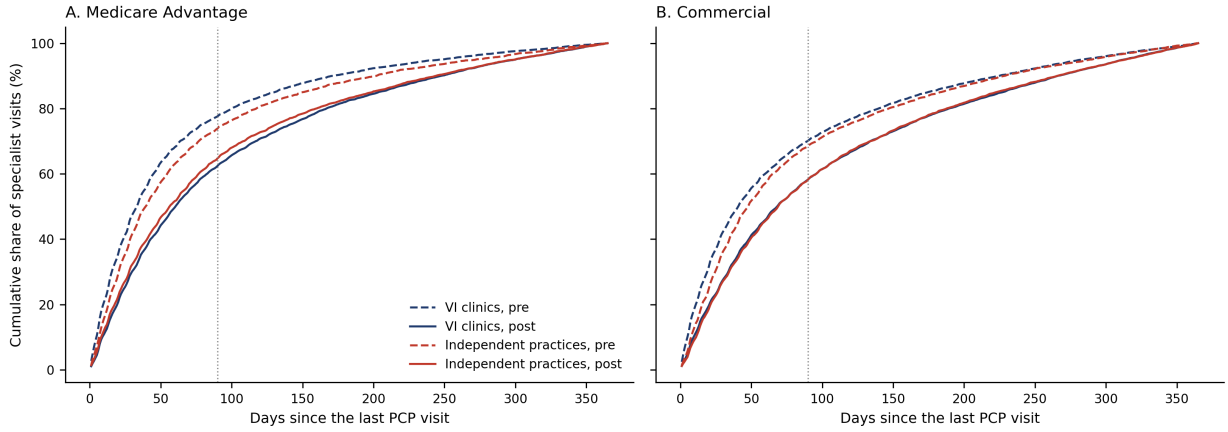


Figure 7: Days between a specialist visit and the patient's most recent prior PCP visit

Notes: Cumulative share of new-patient visits to referable specialists (excluding dermatology, ophthalmology, podiatry, and allergy) by the number of days since the patient's most recent prior PCP visit at the VI clinics or at independent practices, among visits with such a PCP visit in the prior 365 days, 2018–23. Pre is 2018–19 and post 2021–23. The dotted line marks 90 days.

Care use. Counts are distinct patient-days per patient-year (for procedures, imaging, and laboratory services, distinct patient-day-procedure combinations); spending is the allowed amount. An emergency department visit is a day on which the patient has an emergency department evaluation-and-management service billed by any provider, counted once per day; I report two alternative definitions (an emergency place of service, and facility emergency revenue codes).

C Robustness

The appendix follows the order of Section 4. Each subsection opens with the regression robustness checks for its results: one table per result, with one row per check, and one figure with the event study of each row. The subsubsections that follow describe individual checks in more detail.

C.1 Prices

C.1.1 Robustness checks

Rival insurers' prices. Table 12 and Figure 8; Table 13 reports confidence sets that allow departures from parallel trends. For the all-services commercial estimate, adding back blood draws and vision screening leaves the estimate unchanged: 5.9 percent over 2021–23 and 8.3 percent over 2022–23, against 6.0 and 8.4 percent.

Immunization and injection administration. The all-services estimate excludes immunization administration and therapeutic injection administration (CPT 90471 and 96372). Independent

practices bill both, and rival insurers' commercial price for them there barely moves, from about \$40 to \$46 in 2017–19 to about \$30 to \$37 in 2022–23. At the VI clinics the price of both was about \$64 in 2017–18; it fell to \$53 to \$64 in 2019, \$45 to \$47 in 2020, and \$37 to \$42 in 2021, and rose partly back to about \$42 to \$50 in 2022–23. The fall is the same for every rival insurer, for both codes, and for physicians and for nurse practitioners and physician assistants, which suggests that the VI clinics lowered their billed charge for these services and that insurers paying the lesser of the charge and the fee schedule then paid the charge; the claims record no billed charge, so this is an inference. Because the decline starts in 2019, before the acquisition, including these codes yields positive 2017–18 and negative 2020–21 coefficients relative to 2019, and the pre-period test rejects (Table 11). The 2022–23 estimate stays clearly positive in every version. The fall could be part of the acquisition, if the clinics anticipated the deal and raised the visit price while cutting the price of services performed during the visit. Against this, the cut starts two to three years before the visit price rises, and it runs through the clinics' own charge rather than through negotiation. Pricing each visit together with its same-day administration gives nearly the same increase over 2022–23 as the visit alone (12.8 vs. 13.2 percent), so the lower administration price does not offset the higher visit price.

Table 11: Rival insurers' commercial prices across all services: the excluded administration, blood-draw, and vision-screening codes

	Paper (all four excluded)	Blood draws and vision screening added back	All four codes added back
Post, 2021–23	0.060 (0.007)	0.059 (0.006)	0.038 (0.006)
Post, 2022–23	0.084 (0.010)	0.083 (0.010)	0.066 (0.008)
Event study, 2017	−0.010 (0.003)	−0.007 (0.003)	0.008 (0.003)
2018	−0.005 (0.002)	−0.002 (0.002)	0.013 (0.002)
2020	0.011 (0.002)	0.012 (0.002)	−0.011 (0.004)
2021	0.015 (0.002)	0.016 (0.002)	−0.007 (0.004)
2022	0.080 (0.008)	0.079 (0.008)	0.072 (0.007)
2023	0.071 (0.015)	0.074 (0.015)	0.067 (0.013)
Pre-trend p	0.005	0.055	< 0.001
N, 2021–23 (lines)	505,261	583,296	655,241
N, 2022–23 (lines)	420,434	485,508	545,349
N, event study (lines)	600,029	691,223	779,211
PCP clusters	129	129	129

Notes: Log allowed price of rival insurers' commercial claim lines for services that both the VI clinics and independent practices bill, relative to independent practices in the county; the specification of Table 3, column 3, changing only which codes are excluded. The four codes are blood draw (36415), vision screening (99173), immunization administration (90471), and therapeutic injection administration (96372). Event-study coefficients are relative to 2019. Standard errors in parentheses, clustered by PCP.

The VI insurer's hospital prices. Table 14 reports the full inpatient regressions behind Figure 5; Table 15 and Figure 9 collect the checks.

Table 12: Rival insurers' prices at the VI clinics: robustness

	VI × Post						
Check	2021–23	2022–23	Pre-trend p	Observations	Patients	Clusters	Event study
A. Commercial (Figure 8, top)							
Headline (99214)	0.089***	0.130***	0.001	125,606		127	A
	(0.006)	(0.008)					
Fixed 2017–19 insurer weights	0.084***	0.122***	<0.001	147,665		128	B
	(0.006)	(0.008)					
Linear pre-trend removed	0.070***	0.106***		147,678		129	C
	(0.007)	(0.008)					
99213 visits	0.101***	0.143***	<0.001	164,764		129	D
	(0.006)	(0.008)					
99215 visits	0.085***	0.140***	0.29	2,204		89	E
	(0.009)	(0.011)					
All established visits	0.094***	0.135***	<0.001	307,955		129	F
	(0.005)	(0.008)					
Stayer PCPs (a)	0.089***	0.129***	<0.001	113,017		98	G
	(0.006)	(0.008)					
Stayer PCPs (b)	0.093***	0.131***	0.001	88,295		67	H
	(0.006)	(0.009)					
Hospital-system practices as controls	0.102***	0.127***	<0.001	134,326		179	I
	(0.003)	(0.002)					
OB-GYN and pediatric PCPs added	0.083***		0.001	138,379		168	J
	(0.006)						
B. Medicare Advantage (Figure 8, bottom)							
Headline (office visits)	0.017***	0.024***	0.09	86,264		116	A
	(0.003)	(0.003)					
Linear pre-trend removed	0.012**	0.019***		86,264		116	
	(0.005)	(0.006)					
99213 visits	0.020***	0.025***	0.11	39,583		114	B
	(0.004)	(0.004)					
All established visits	0.017***	0.024***	0.09	100,345		117	C
	(0.002)	(0.003)					
Stayer PCPs (a)	0.017***	0.024***	0.10	78,220		91	D
	(0.003)	(0.003)					
Stayer PCPs (b)	0.015***	0.023***	0.24	59,173		59	E
	(0.002)	(0.003)					
Hospital-system practices as controls	0.037***	0.041***	0.63	102,039		151	F
	(0.005)	(0.005)					

Notes: Each row is one regression of the log allowed amount of rival insurers' claim lines at the VI clinics against independent practices in the same market, with the headline's fixed effects (contract cell × credential × year, PCP × clinic, insurer × modifier) and patient controls unless the row says otherwise; base year 2019. Post = 2021–23 leaves out 2020; Post = 2022–23 leaves out 2020 and 2021. Linear pre-trend removed: the event study with a linear trend fitted through the pre-period removed (no pre-trend test). Stayer PCPs: (a) PCPs at the same practice before and after; (b) the stricter set. Hospital-system practices as controls: the hospital system's own PCPs replace the independents. OB-GYN and pediatric PCPs added: separate roster run, Post = 2021–23 only. Medicare Advantage: rival insurers' office-visit prices relative to the contract's Medicare fee schedule. Event study: the panel of the figure with this check's year coefficients. Standard errors clustered by PCP in parentheses. $^{*}p<.10$, $^{**}p<.05$, $^{***}p<.01$

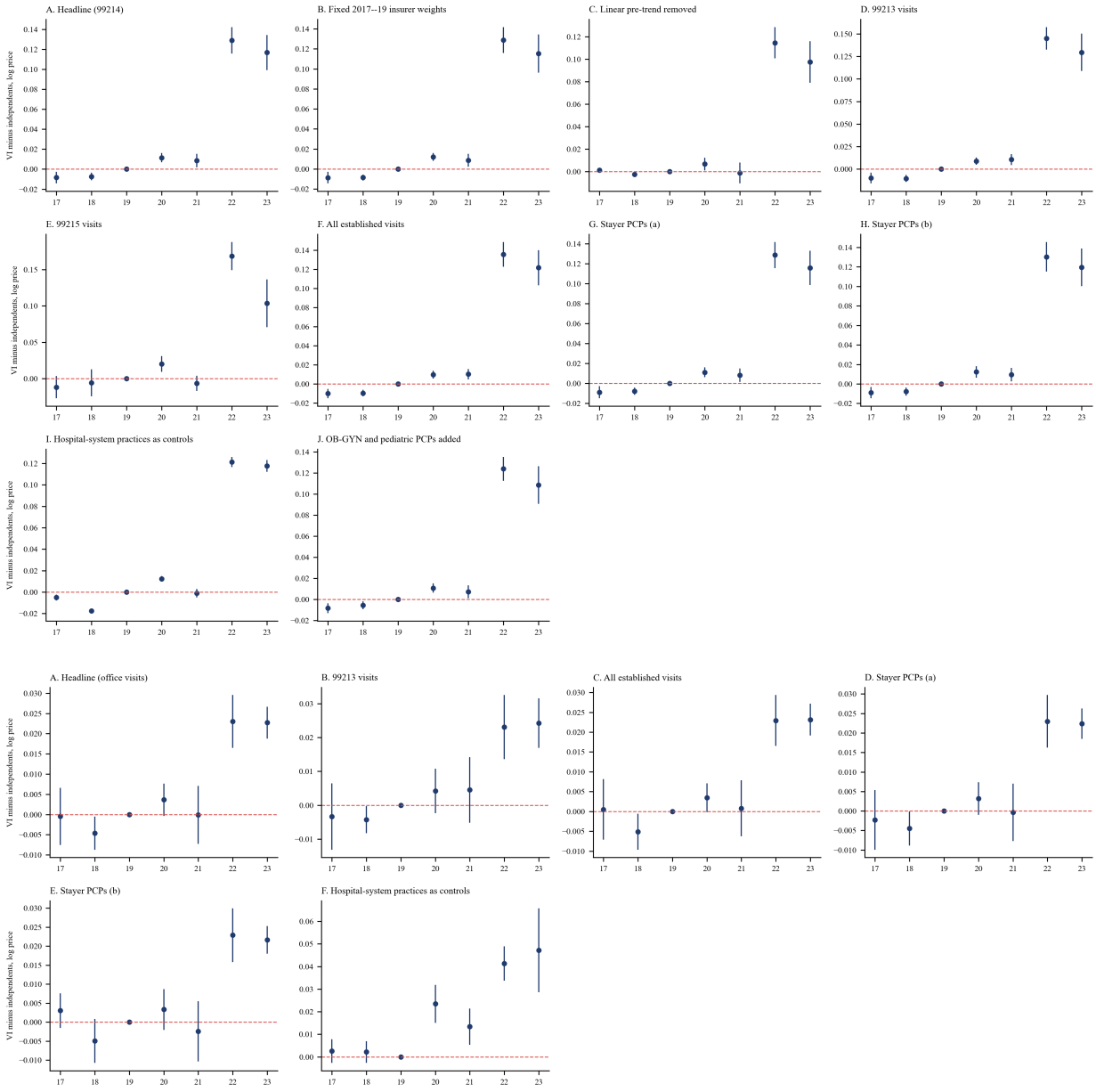


Figure 8: Rival insurers' prices at the VI clinics, relative to independent practices: robustness

Notes: Event studies of the rows of Table 12: commercial insurance (top) and Medicare Advantage (bottom); panel letters as in the table's last column. 2019 omitted; 95 percent confidence intervals, standard errors clustered by PCP.

Table 13: Rival commercial price at the VI clinics, 2022: robust confidence sets under violations of parallel trends

$\bar{M}$	Lower bound	Upper bound
Original	0.116	0.142
0.5	0.107	0.154
1	0.094	0.168
1.5	0.080	0.182
2	0.065	0.198

Notes: Rambachan and Roth (2023) relative-magnitudes bounds for the 2022 event-study coefficient of the commercial price (Table 3): 95% confidence sets when the post-period violation of parallel trends may be up to $\bar{M}$ times the largest pre-period change. Method C-LF.

Table 14: The VI insurer's inpatient prices at the dominant system's hospitals, relative to rival insurers

	Medicare Advantage	
	(1) Facility	(2) Physician
VI insurer × Post (2021–23)	−0.008	0.046
	(0.011)	(0.039)
VI insurer × Post (2022–23)	−0.014	−0.012
	(0.013)	(0.042)
Pre-trend p	0.83	0.50
Admissions, Post = 2021–23 (2020 out)	17,292	17,288
Admissions, event study (2017–23)	19,419	19,415
Clusters (hospital × DRG), event study	558	558

Notes: Admissions at the dominant system's hospitals; the VI insurer's admissions against rival insurers' admissions at the same hospitals. Outcome: log facility price per admission (column 1) or log price of the physician claims during the stay (column 2). Diagnosis-related group (DRG) × year, DRG × hospital, and insurer × DRG fixed effects; controls for age, age squared, and sex. Post = 2021–23 leaves out 2020; Post = 2022–23 leaves out 2020 and 2021. The pre-trend p tests that the 2017 and 2018 event-study coefficients are jointly zero (base year 2019; Figure 5). Standard errors clustered by hospital × DRG in parentheses. $^{*}p<.10$, $^{**}p<.05$, $^{***}p<.01$

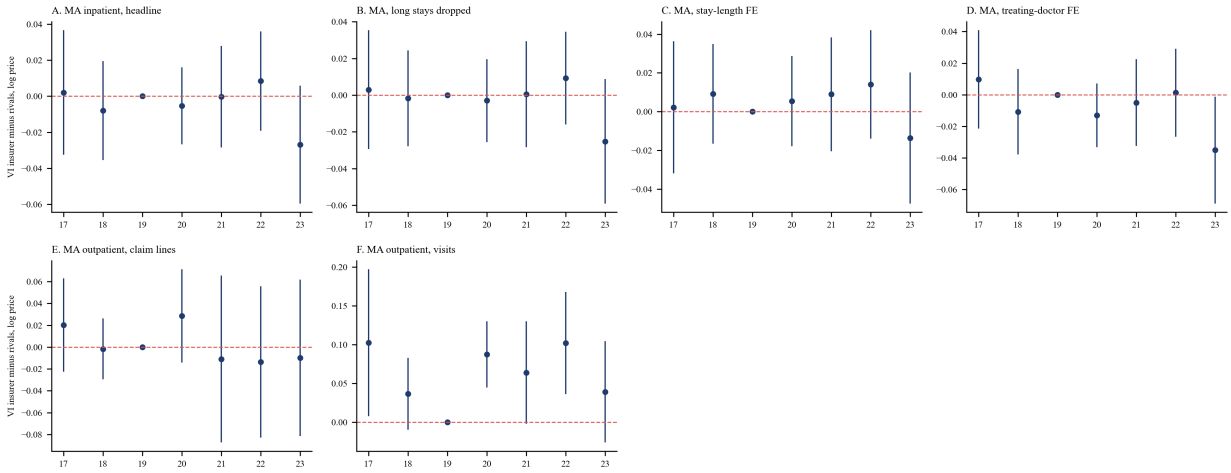


Figure 9: The VI insurer's hospital prices at the dominant system, relative to rival insurers: robustness
Notes: Event studies of the rows of Table 15; panel letters as in the table's last column. 2019 omitted; 95 percent confidence intervals.

Table 15: The VI insurer's hospital prices: robustness

	VI × Post						
Check	2021–23	2022–23	Pre-trend p	Observations	Patients	Clusters	Event study
MA inpatient, headline	−0.008	−0.014	0.83	17,292		545	A
	(0.011)	(0.013)					
MA, long stays dropped	−0.009	−0.015	0.97	16,603		540	B
	(0.010)	(0.011)					
MA, stay-length FE	−0.003	−0.009	0.78	17,292		545	C
	(0.011)	(0.012)					
MA, treating-doctor FE	−0.015	−0.022*	0.55	15,750		522	D
	(0.010)	(0.012)					
MA outpatient, claim lines	−0.014		0.48	812,605		785	E
	(0.035)						
MA outpatient, visits	0.028		0.10	383,004		435	F
	(0.042)						

Notes: Each row is one regression of the VI insurer's price against rival insurers' prices at the dominant system's hospitals, base year 2019. Inpatient rows: log facility price per admission, DRG × year, DRG × hospital, and insurer × DRG fixed effects (details in Table 17); clusters are hospital × DRG. Outpatient rows: log price of outpatient facility claim lines or visits, code × year and insurer × code fixed effects, Post = 2021–23 only. Post = 2021–23 leaves out 2020; Post = 2022–23 leaves out 2020 and 2021. Event study: panel of Figure 9. Standard errors in parentheses. $^{*}p<.10$, $^{**}p<.05$, $^{***}p<.01$

C.1.2 The hospital system's practices as controls

Table 16 repeats the rival-price estimates with the dominant hospital system's primary care practices in the county as controls instead of independent practices. The commercial increases are nearly the same as with independent controls, with the same jump in 2022, although the 2018 coefficient, −0.018, is the largest pre-period gap among the price checks. The Medicare Advantage increase has the same sign and is about twice the main estimate, with a flat pre-period, although the hospital system's rival MA prices can move with its hospital contracts. It also rises before 2022, by 0.023 in 2020 and 0.013 in 2021 relative to 2019; whether this is a gradual rise or drift in the controls, it means that part of the larger MA estimate may not come from the acquisition.

Table 16: Rival insurers' prices with the hospital system's practices as controls

	Commercial				Medicare Advantage	
	Office visit		All services		All rival insurers	
	Pooled (1)	Fixed weights (2)	Pooled (3)	Fixed weights (4)	Pooled (5)	Fixed weights (6)
VI × Post (2021–23)	0.102	0.091	0.058	0.053	0.037	0.028
	(0.003)	(0.002)	(0.004)	(0.003)	(0.005)	(0.003)
VI × Post (2022–23)	0.127	0.131	0.073	0.076	0.041	0.033
	(0.002)	(0.002)	(0.006)	(0.005)	(0.005)	(0.004)
Main estimate, 2022–23 (independent controls)	0.130	0.122	0.084	0.078	0.024	0.021
Pre-trend test, p-value	<0.001	<0.001	<0.001	<0.001	0.63	0.017
Procedure codes	1	1	51	51	2	2
Observations (lines)	134,326	157,485	545,492	638,031	102,039	101,987
VI clinics | hospital system	84,359 | 49,967	99,274 | 58,211	345,286 | 200,206	407,553 | 230,478	52,472 | 49,567	52,454 | 49,533
Patients, VI clinics | hospital system	29,900 | 17,252	32,065 | 18,477	52,503 | 32,677	54,285 | 33,971	7,654 | 8,085	7,645 | 8,072
PCP-years, VI clinics | hospital system	367 | 446	439 | 523	367 | 454	439 | 531	318 | 337	318 | 337
PCPs, VI clinics | hospital system	77 | 102	77 | 102	77 | 105	77 | 104	69 | 82	69 | 82
Clusters (PCPs)	179	179	182	181	151	151

Notes: Each column repeats the specification of the corresponding column of Table 3 (columns 1–4) or Table 4 (columns 5–6), with the dominant hospital system's primary care practices in the county as the control group in place of independent practices. Pooled estimates compare 2021–23 or 2022–23 with 2017–19. The main estimate row repeats the 2022–23 estimate of the corresponding column with independent practices as controls. Standard errors clustered by PCP in parentheses. The hospital system may also set its practices' rival MA prices together with its hospital contracts.

C.1.3 Inpatient prices: length of stay, outlier stays, and the treating doctor

Table 17 and Figure 10 repeat the inpatient price comparison of Section 4.4. In Medicare Advantage, the VI insurer obtains no significant discount when the longest stays are dropped, with fixed effects for length of stay, or with fixed effects for the treating doctor (−0.015, standard error 0.010, over 2021–23; −0.022, standard error 0.012, over 2022–23). I do not report commercial inpatient prices, because the VI insurer has too few commercial admissions at these hospitals (footnote 10). Table 18 shows that in Medicare Advantage the price rises little with length of stay for both groups, as under a per-case payment.

C.1.4 Hospital outpatient prices

Table 17: The VI insurer's inpatient prices at the dominant system's hospitals: length of stay, outlier stays, and the treating doctor

	(1) Headline	(2) Long stays dropped	(3) Stay-length FE	(4) Doctor sample	(5) Treating-doctor FE	(6) Doctor FE, all lines
Medicare Advantage						
VI insurer × Post (2021–23)	−0.008	−0.009	−0.003	−0.009	−0.015	−0.012
	(0.011)	(0.010)	(0.011)	(0.011)	(0.010)	(0.010)
VI insurer × Post (2022–23)	−0.014	−0.015	−0.009	−0.015	−0.022*	−0.020*
	(0.013)	(0.011)	(0.012)	(0.013)	(0.012)	(0.012)
Pre-trend p	0.83	0.97	0.78	0.88	0.55	0.67
Admissions, Post = 2021–23 (2020 out)	17,292	16,603	17,292	15,929	15,750	15,916
Admissions, event study (2017–23)	19,419	18,673	19,419	18,032	17,864	18,036
Clusters (hospital × DRG)	545	540	545	524	522	527
Stay-length FE			✓			
Treating-doctor FE					✓	✓

Notes: Admissions at the dominant system's hospitals; the VI insurer's admissions against rival insurers' admissions at the same hospitals. Outcome: log facility price per admission. Every column has DRG × year, DRG × hospital, and insurer × DRG fixed effects and controls for age, age squared, and sex, as in the headline (column 1). Column (2) drops stays longer than the 95th percentile of length of stay within the DRG; column (3) adds length-of-stay fixed effects (one for each day up to 14, one for 15 or more); length of stay is the span of the admission's service dates. Column (4) keeps admissions with a treating doctor, without doctor fixed effects; column (5) adds treating-doctor fixed effects, where the treating doctor is the individual clinician with the highest allowed amount on the admission's inpatient professional claims; column (6) uses all professional claims during the stay. Post = 2021–23 leaves out 2020; Post = 2022–23 leaves out 2020 and 2021. The pre-trend p tests that the 2017 and 2018 event-study coefficients are jointly zero (base year 2019; Figure 10). Standard errors clustered by hospital × DRG in parentheses. $^{*}p<.10$, $^{**}p<.05$, $^{***}p<.01$

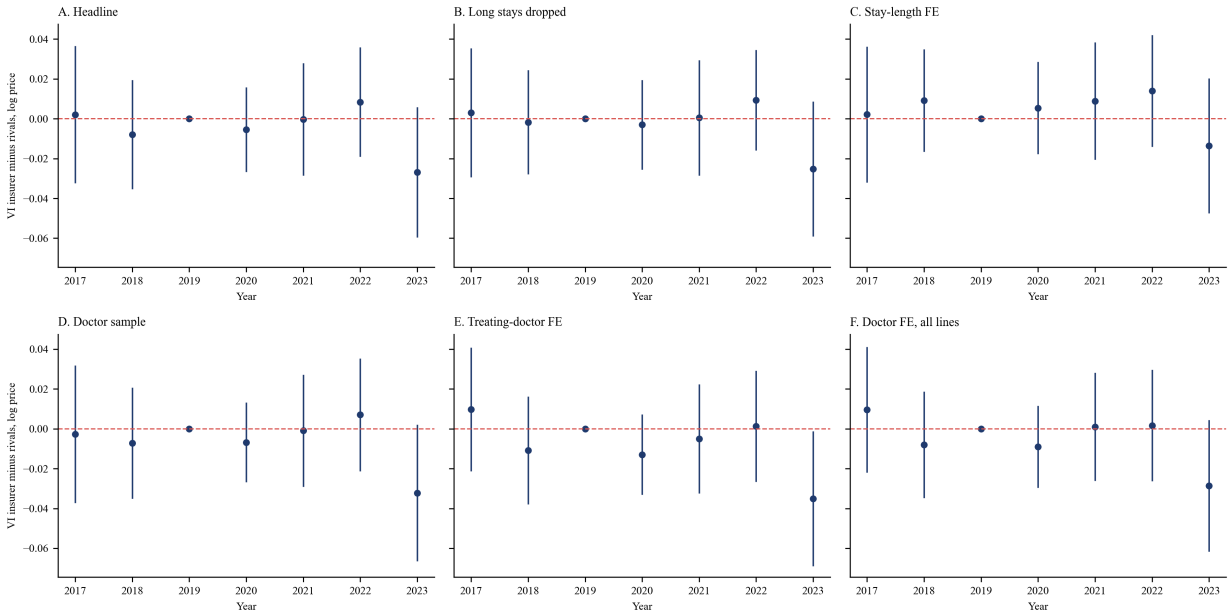


Figure 10: The VI insurer's inpatient prices at the dominant system's hospitals, relative to rival insurers: robustness

Notes: Event studies of the specifications in Table 17, columns 1–6 (panels A–F), Medicare Advantage. 2019 omitted; 95 percent confidence intervals, standard errors clustered by hospital and diagnosis-related group.

Table 18: Are inpatient stays paid per case or per day? Slope of the log facility price on log length of stay

	VI insurer		Rival insurers	
	2017–19	2021–23	2017–19	2021–23
Medicare Advantage	0.061***	0.098***	0.127***	0.101***
	(0.020)	(0.013)	(0.018)	(0.017)
Admissions	747	2,375	9,044	4,515

Notes: Each cell is one regression of the log facility price on log(length of stay + 1), with hospital × DRG × insurer and year fixed effects and age, age squared, and sex controls, at the dominant system's hospitals. A slope near zero means the stay is paid per case (a DRG rate); a slope near one means it is paid per day. Length of stay is the span of the admission's service dates. Standard errors clustered by hospital × DRG in parentheses. $^{*}p<.10$, $^{**}p<.05$, $^{***}p<.01$

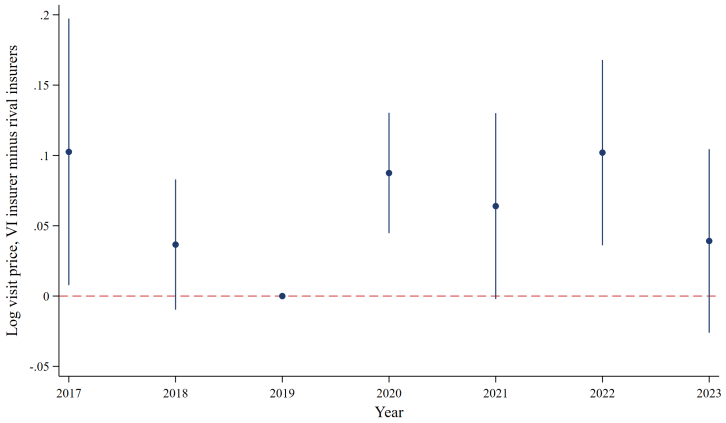


Figure 11: The VI insurer's MA hospital outpatient prices per visit at the dominant local hospital system, relative to rival insurers

Notes: Event study of the log facility price per outpatient visit (the sum of a visit's institutional outpatient claim lines; a visit is a patient's claim at one hospital on one day), VI insurer's visits minus rival insurers' visits with the same main procedure or emergency department level at the same hospital. Final claim versions, no denials or secondary coverage, positive allowed amount; prices trimmed at the 5th and 99th percentiles within procedure. Procedure-by-year, procedure-by-hospital, and insurer-by-procedure fixed effects; patient age, age squared, and sex. 2019 omitted; 95 percent confidence intervals, standard errors clustered by hospital and procedure. 383,004 visits, 435 clusters, 156 procedures. Pooled estimate 2.8 log points (standard error 4.2); mean of 2022–23 7.1 (3.3); pre-trend $p = 0.10$.

C.1.5 Medicare Advantage premiums

Table 19: Medicare Advantage premiums in the VI clinics' county: the VI insurer and rival insurers, 2017–23

	2017	2018	2019	2020	2021	2022	2023	Pre	Post	Post − pre
A. Individual Medicare Advantage plans, excluding special needs plans										
Total premium ($/month)										
VI insurer	15.1	17.1	18.6	12.4	13.0	14.0	12.3	16.9	13.1	−3.8
Rival insurers	46.0	38.2	35.0	39.4	35.7	28.1	24.8	39.8	29.5	−10.3
VI minus rivals	−31.0	−21.1	−16.5	−27.0	−22.7	−14.1	−12.5	−22.8	−16.4	**+6.4**
Part C premium ($/month)										
VI insurer	4.6	8.0	9.4	4.2	2.6	2.2	1.6	7.3	2.1	−5.2
Rival insurers	22.2	17.5	15.3	15.4	15.2	12.8	11.7	18.4	13.3	−5.1
VI minus rivals	−17.6	−9.6	−5.9	−11.2	−12.6	−10.6	−10.1	−11.0	−11.1	**−0.1**
Part D premium ($/month)										
VI insurer	10.5	9.1	9.1	8.3	10.4	11.8	10.7	9.6	11.0	+1.4
Rival insurers	23.8	20.7	19.7	24.0	20.5	15.2	13.0	21.4	16.2	−5.2
VI minus rivals	−13.4	−11.5	−10.6	−15.7	−10.1	−3.5	−2.3	−11.8	−5.3	**+6.6**
Enrollees in $0-premium plans (%)										
VI insurer	60	59	57	69	66	64	68	59	66	+7
Rival insurers	39	47	52	43	47	64	68	46	59	+14
VI minus rivals	21	12	6	26	20	0	0	13	7	**−6**
Enrollment										
VI insurer	8,724	10,472	12,335	23,787	26,698	27,277	27,561	10,511	27,178	+16,668
Rival insurers	23,617	25,614	26,159	18,879	19,277	20,093	20,459	25,130	19,943	−5,187
Plans offered										
VI insurer	3	3	3	4	6	6	5	3	6	+3
Rival insurers	17	16	20	25	29	29	29	18	29	+11
B. Including special needs plans (list premium)										
Total premium ($/month)										
VI insurer	15.6	17.4	18.6	12.5	13.3	14.1	12.8	17.2	13.4	−3.8
Rival insurers	42.6	37.9	34.9	38.9	35.7	29.5	26.8	38.5	30.7	−7.8
VI minus rivals	−27.0	−20.4	−16.3	−26.5	−22.4	−15.3	−14.1	−21.2	−17.3	**+4.0**
Part C premium ($/month)										
VI insurer	4.5	7.7	9.2	4.1	2.5	2.1	1.5	7.2	2.1	−5.1
Rival insurers	18.8	15.9	14.0	14.3	14.3	11.4	9.8	16.2	11.9	−4.4
VI minus rivals	−14.3	−8.2	−4.8	−10.2	−11.8	−9.3	−8.3	−9.1	−9.8	**−0.7**
Part D premium ($/month)										
VI insurer	11.1	9.7	9.4	8.4	10.7	12.0	11.2	10.1	11.3	+1.3
Rival insurers	23.8	22.0	20.9	24.6	21.4	18.1	17.0	22.2	18.8	−3.4
VI minus rivals	−12.7	−12.3	−11.5	−16.2	−10.6	−6.1	−5.7	−12.1	−7.5	**+4.7**
Enrollees in $0-premium plans (%)										
VI insurer	58	57	56	68	65	62	64	57	64	+7
Rival insurers	38	42	47	40	44	57	57	42	53	+10
VI minus rivals	21	15	9	28	21	5	7	15	11	**−3**
Enrollment										
VI insurer	8,993	10,758	12,633	24,125	27,090	28,124	29,174	10,795	28,129	+17,334
Rival insurers	27,959	28,209	28,566	20,297	20,442	22,636	24,443	28,245	22,507	−5,737
Plans offered										
VI insurer	5	5	6	7	9	10	9	5	9	+4
Rival insurers	21	17	22	27	31	34	34	20	33	+13

Notes: This table presents the monthly premiums of Medicare Advantage plans offered in the VI clinics' county, for the VI insurer and rival insurers, from CMS's public plan files. Means are weighted by each plan's average monthly enrollment in the county that year; enrollment counts that CMS suppresses (1 to 10 enrollees) are set to 5. The total premium is the Part C plus Part D premium; the Part D premium is the total minus the Part C premium, and zero for plans without drug coverage. Panel A excludes special needs plans; Panel B adds them at their list premium, before the low-income subsidy that pays the Part D premium of most dual-eligible enrollees. Employer group, cost, PACE, Part-B-only, and medical savings account plans are excluded. Pre is the 2017–19 mean and post the 2021–23 mean; the bold entry in the last column is the change for the VI insurer minus the change for rival insurers. A plan-level event study with insurer fixed effects gives the same sign: the VI insurer's premium rises by $12 to $25 a month relative to rival insurers' plans, depending on the base year.

Table 20: Medicare Advantage supplemental benefits in the VI clinics' county: the VI insurer and rival insurers

	VI insurer		Rival insurers	
	2017–19	2021–23	2017–19	2021–23
Share of enrollees in plans offering the benefit (%)				
Dental, any	17	100	93	89
Dental, comprehensive	0	36	83	65
Eye exams	100	100	100	100
Eyewear	76	100	99	100
Hearing exams and hearing aids	100	100	74	100
Over-the-counter allowance	48	51	3	61
Fitness	100	100	100	100
Annual amount, plans that offer it ($)				
Comprehensive dental maximum	–	1,150	998	1,107
Over-the-counter allowance	200	278	100	150
Plans offered, mean per year	3	5.7	17.7	29
Average monthly enrollment, mean per year	10,511	27,178	25,130	19,943

Notes: This table presents the supplemental benefits of individual Medicare Advantage plans offered in the VI clinics' county, from CMS's public Plan Benefit Package files, for the same plans, enrollment weights, and exclusions as Panel A of Table 19 (special needs plans excluded). Shares are enrollment-weighted shares of enrollees in plans that offer the benefit, as a mandatory or optional supplemental benefit. Dollar amounts are annualized and averaged over plans that offer the benefit and state a maximum; when a plan states one combined maximum for preventive and comprehensive dental care, that amount is used. – = no VI insurer plan offered comprehensive dental before 2022. The VI insurer's plans offered dental coverage to all enrollees from 2020; comprehensive dental appears in 2022 (8 percent of enrollees) and covers all of them in 2023.

Table 21 reports the cost-sharing terms of the same plans.

Table 21: Cost-sharing in the VI insurer's and rival insurers' Medicare Advantage plans in the county

	VI insurer		Rival insurers		Difference-in-
	2017–19	2021–23	2017–19	2021–23	differences
	(1)	(2)	(3)	(4)	(5)
PCP visit copay ($)	1.1	0.0	8.6	7.2	1.3
					(2.5)
Specialist visit copay ($)	35.7	35.6	32.7	29.9	−1.0
					(3.3)
Medical (Part C) deductible ($)	0	2	34	5	0.8
					(14.3)
Drug (Part D) deductible ($)	222	130	144	156	−83.6***
					(17.7)
Out-of-pocket maximum, in network ($)	3,969	4,562	4,482	5,458	58.2
					(329.6)

Notes: Medicare Advantage plans offered in the county (CMS landscape and plan benefit files; no special needs, employer, or Medicare-Medicaid plans). Columns 1–4: means over plan × segment × year, weighted by December enrollment (CMS county-plan enrollment), 2020 left out. Copays are the minimum in-network copay for a PCP and a specialist office visit. Column 5: event-study difference-in-differences of the VI insurer's plans against rival insurers' plans with year and insurer-group fixed effects, enrollment-weighted, base year 2019: the mean of the 2021–23 coefficients. Standard errors clustered by contract in parentheses; the VI insurer has few contracts in the county, so these standard errors are approximate. $^{*}p<.10$, $^{**}p<.05$, $^{***}p<.01$

C.1.6 Commercial premiums (descriptive)

Table 22: The VI insurer's commercial premiums in Oregon, relative to rival insurers

	2017	2018	2019	2020	2021	2022	2023	2024
A. Approved small-group rate change (percent)								
VI insurer	−5.5	7.2	7.2	11.7	−1.1	1.3	4.9	0.8
Rival insurers, average	3.8	6.2	0.0	5.4	3.7	1.9	6.3	7.2
B. Premium per member-month, small group (dollars)								
VI insurer	391	417	426	444	522	538	521	536
Rival insurers	389	420	437	451	470	489	518	551
C. Premium per member-month, large group (dollars)								
VI insurer	380	397	438	468	494	516	547	588
Rival insurers	458	481	498	512	533	551	583	630

Notes: Oregon statewide, fully insured plans. Panel A: average approved (final) small-group rate change by plan year, from the state regulator's rate-review decisions; the VI insurer's figure is for its main insurance company, and the rival figure is the simple average across the other insurers filing that year (seven in 2018–23, six in 2024, and a different set of ten in 2017). Panels B and C: premium earned per member-month from insurers' medical loss ratio filings with CMS; the rival figure is total premium divided by total member-months across all other insurers filing in that market. The VI insurer has essentially no individual-market business in Oregon (fewer than 100 enrollees in 2017–19, none after) and files no individual-market rates in 2017–23. Descriptive only: statewide figures, no difference-in-differences.

C.1.7 Additional price event studies

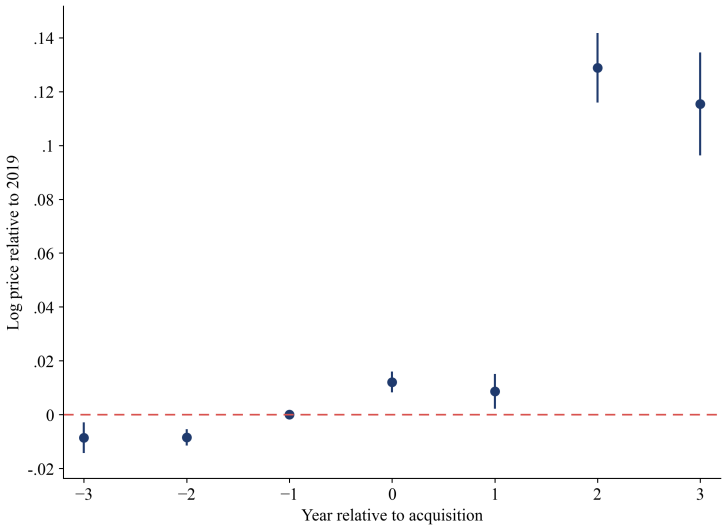


Figure 12: Rival insurers' commercial prices for office visits at the VI clinics, relative to independent practices: fixed insurer weights

Notes: As Figure 1, but each insurer's own path is estimated and the paths are averaged with weights fixed at the VI clinics' 2017–19 insurer mix (Table 3, column 2). Same vertical axis as Figure 1. 2019 omitted; 95 percent confidence intervals, standard errors clustered by PCP.

C.2 Physician behavior

C.2.1 Robustness checks

Coding. Table 23 and Figure 13.

Referrals. Table 24 reports the across-clinic comparison of Section 4.4.2 (enrollees of the same VI insurer plan, VI clinics vs. independent practices, following doctors) with its rival-insurer placebo; Table 25 and Figure 15 collect the checks of that comparison.

For a visit v of patient e with PCP d in year t,

$$y_v = \sum_{k \neq 2019} \beta_k \left(VI_d \cdot \mathbf{1}[t = k] \right) + \alpha_d + \lambda_t + X'_{et}\gamma + \varepsilon_v, \tag{5}$$

where VI_d equals one for PCPs ever at the VI clinics, α_d and λ_t are PCP and year fixed effects, and X_{et} holds the patient's age and sex.

Table 23: The VI insurer's enrollees' risk scores: robustness

	VI × Post						
Check	2021–23	2022–23	Pre-trend p	Observations	Patients	Clusters	Event study
Headline specification without PCP × year FE		0.043***	0.12	71,351	14,724	102	A
		(0.014)					
VI insurer's main plan only		0.041***	0.89	65,942	14,043	102	B
		(0.014)					
Insurer fixed effects		0.033**	0.22	71,351	14,724	102	C
		(0.014)					
Insurer FE, main plan		0.036**	0.92	65,942	14,043	102	D
		(0.014)					
Age, sex, dual and baseline-risk × year FE		0.044***	0.18	71,335	14,720	98	E
		(0.015)					
Stayer PCPs, all plans		0.037*	0.36	52,148	11,554	46	F
		(0.020)					
Stayer PCPs, main plan		0.034*	0.79	47,917	10,954	46	G
		(0.019)					
Stayer PCPs + demographic × year FE, all plans		0.041**	0.28	52,148	11,554	46	H
		(0.019)					
Stayer PCPs + demographic × year FE, main plan		0.038**	0.75	47,917	10,954	46	I
		(0.018)					
Clean cohort		0.049**	0.94	46,342	9,489	101	J
		(0.023)					
Never-switchers		0.040**	0.19	55,249	11,913	102	K
		(0.017)					
No home, phone or virtual lines		0.037**	0.08	71,351	14,724	102	L
		(0.014)					
No home lines, main plan		0.035**	0.90	65,944	14,044	102	M
		(0.014)					
Second plan kept through 2021		0.047***	0.18	74,297	14,878	102	N
		(0.014)					
Rival enrollees: VI clinics vs. independents	0.016	0.023	0.78	71,138	16,207	178	O
	(0.019)	(0.020)					
Triple difference vs. all independents		0.036*	0.49	109,801	23,539	231	P
		(0.021)					
Triple difference vs. capitated independents		0.034	0.39	91,853	19,962	171	Q
		(0.025)					
New payment-relevant conditions (HCC)		0.103***	0.35	51,952		68	R
		(0.032)					
Out of market, triple difference		0.016	0.21	99,698	21,462	134	S
		(0.055)					

Notes: Each row is one regression; the headline (Table 6) compares the VI insurer's Medicare Advantage enrollees with rival insurers' enrollees at the VI clinics, patient and year fixed effects, risk score from claims billed by the VI clinics, treatment from 2022 (Post = 2022–23). Main plan: the VI insurer's PPO plan only. Age, sex, dual and baseline-risk × year FE: the headline with age band, sex, Medicaid-dual status, and tercile of the 2017–19 risk score, each interacted with year, added. Stayer PCPs: patient-years whose main PCP was at the VI clinics both in 2017–19 and in 2021–23 (patients need not keep the same PCP); + demographic × year FE adds the four group × year fixed effects of row E. Clean cohort, never-switchers, no home lines, and second plan kept: the headline on the restricted sample. Rival enrollees and triple differences: risk score from the VI clinics' practice claims; triple differences compare the VI clinics' VI-insurer-minus-rival gap with the same gap at independent practices (all, or those capitated by the VI insurer), or at matched practices in other markets. New payment-relevant conditions: HCCs not recorded before. Patients: patients in the regression where the result file records them. Event study: panel of Figure 13 (base year 2019). Standard errors clustered by PCP in parentheses. Rows E–I use the headline's patient and PCP-by-year fixed effects; all other rows use patient and year fixed effects, without the PCP-by-year fixed effects of the headline. $^{*}p<.10$, $^{**}p<.05$, $^{***}p<.01$

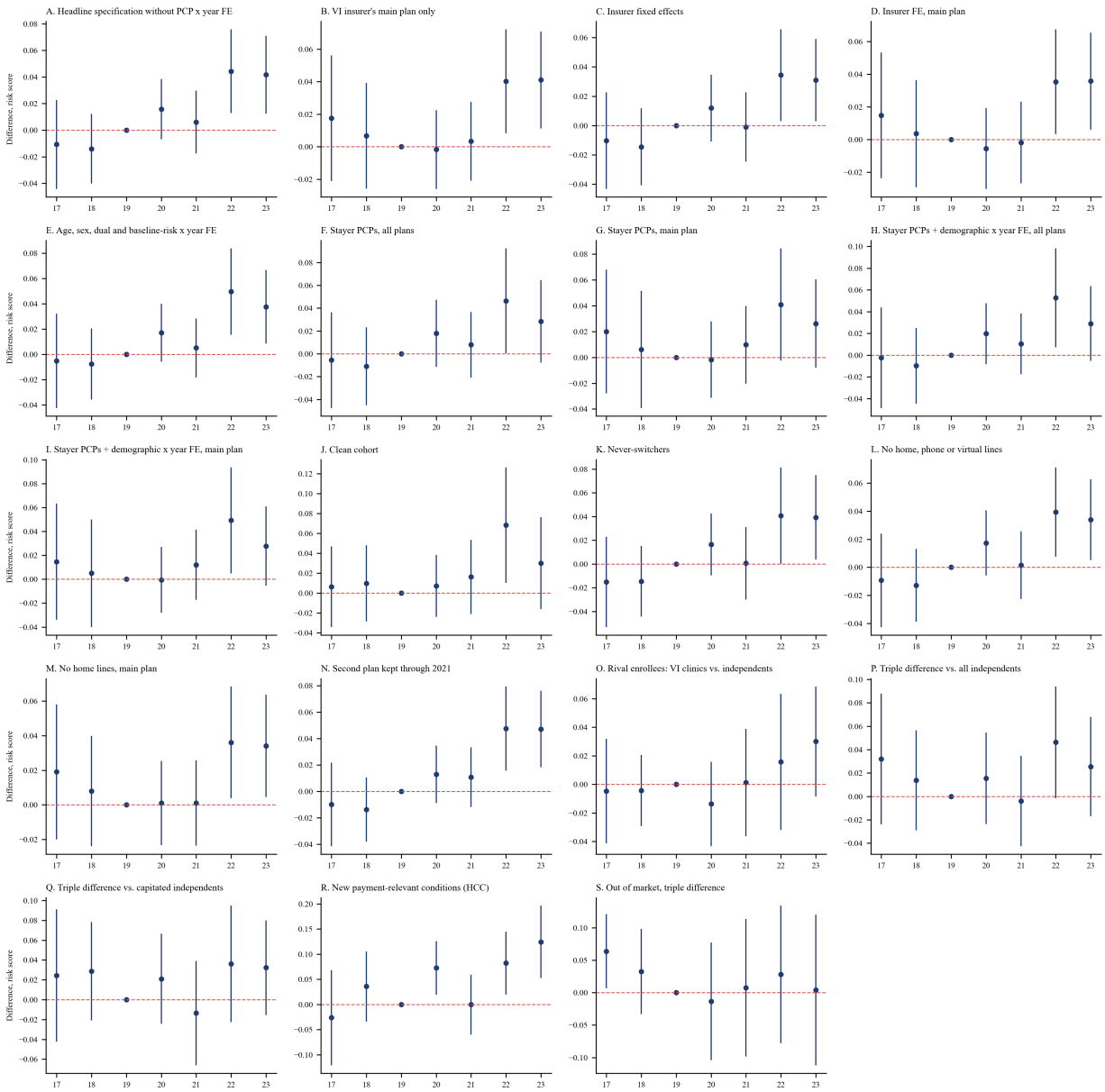


Figure 13: Recorded risk of the VI insurer's MA enrollees: robustness

Notes: Event studies of the rows of Table 23; panel letters as in the table's last column. 2019 omitted; 95 percent confidence intervals.

Table 24: Specialist referrals after the acquisition: VI-clinic PCPs vs. independent-practice PCPs

	VI insurer's enrollees		Rival insurers' enrollees (placebo)	
		Linear pre-trend removed		Linear pre-trend removed
	(1)	(2)	(3)	(4)
VI × Post (2021–23)	−0.0216**	−0.1053**	−0.0037	0.0200
	(0.0102)	(0.0448)	(0.0066)	(0.0231)
VI × Post (2022–23)	−0.0234**	−0.1177**	−0.0071	0.0187
	(0.0109)	(0.0508)	(0.0084)	(0.0262)
Pre-trend test, p-value	0.057		0.300	
Pre-period referral rate, VI PCPs	0.166	0.166	0.157	0.157
Observations (PCP visits)	54,554	66,931	123,138	147,167
VI clinics | independent practices	30,362 | 24,192	37,451 | 29,480	73,272 | 49,866	87,712 | 59,455
Patients, VI clinics | independent practices	4,980 | 3,810	5,214 | 4,013	8,807 | 6,196	9,139 | 6,468
PCP-years, VI clinics | independent practices	318 | 201	384 | 240	320 | 208	386 | 248
PCPs, VI clinics | independent practices	67 | 47	67 | 48	67 | 49	67 | 50
PCP clusters	114	115	116	117
Linear pre-trend removed	No	Yes	No	Yes
PCP and year FE	Yes	Yes	Yes	Yes
Patient controls (age, sex)	Yes	Yes	Yes	Yes

Notes: This table presents difference-in-differences estimates of specialist referrals by primary care providers (PCPs) ever at the VI clinics, relative to PCPs at independent practices in the same county. Each observation is a PCP office visit of a Medicare Advantage patient. The outcome is one if the patient has a new-patient visit with a specialist within 90 days, excluding dermatology, ophthalmology, podiatry, and allergy, which patients reach without a referral. Columns 1 and 2 use the VI insurer's enrollees in its main MA plan; columns 3 and 4, a placebo, use rival insurers' enrollees. The VI insurer's second MA plan is left out because it has no office visits recorded before 2020 and stops reporting the VI clinics' claims in 2022, so it cannot be compared before and after. Columns 2 and 4 remove a linear pre-trend: a line fitted to the 2017 and 2018 event-study coefficients (relative to 2019) is subtracted from the post-period coefficients, so their sample is the event-study sample; because the line rests on two pre-period years, these columns show whether the change survives the trend, not its size. VI × Post compares 2021–23 with 2017–19, leaving out 2020; the second row compares 2022–23 with 2017–19, leaving out 2020 and 2021. All columns include PCP and year fixed effects and controls for patient age and sex. The pre-trend test is the joint test that the 2017 and 2018 event-study coefficients, relative to 2019, are zero. Standard errors clustered by PCP in parentheses. Wild cluster bootstrap p-values (restricted, Webb weights, 9,999 replications) give the same conclusions. $^{*}p<.10$, $^{**}p<.05$, $^{***}p<.01$

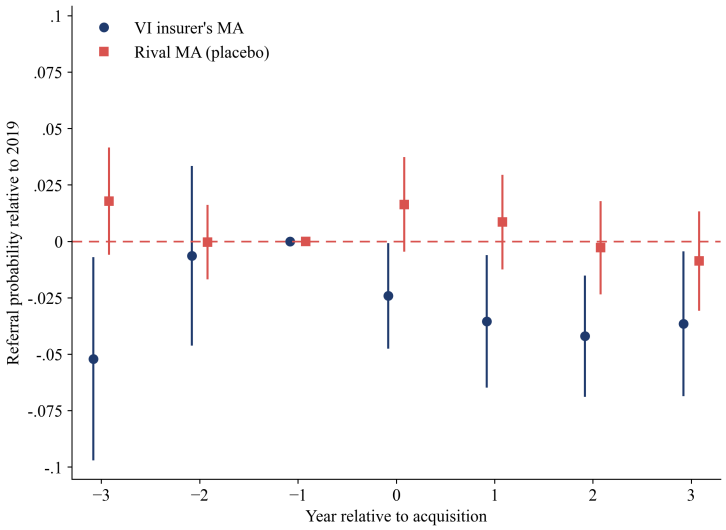


Figure 14: Specialist referrals of the same plan's enrollees, VI clinics vs. independent practices

Notes: Estimates of Equation (5): PCP and year fixed effects, patient age and sex (and insurer fixed effects for the placebo); 2019 omitted; 95 percent confidence intervals, standard errors clustered by PCP. 66,931 visits and 115 PCPs (VI insurer's MA); 147,167 visits and 117 PCPs (rival MA).

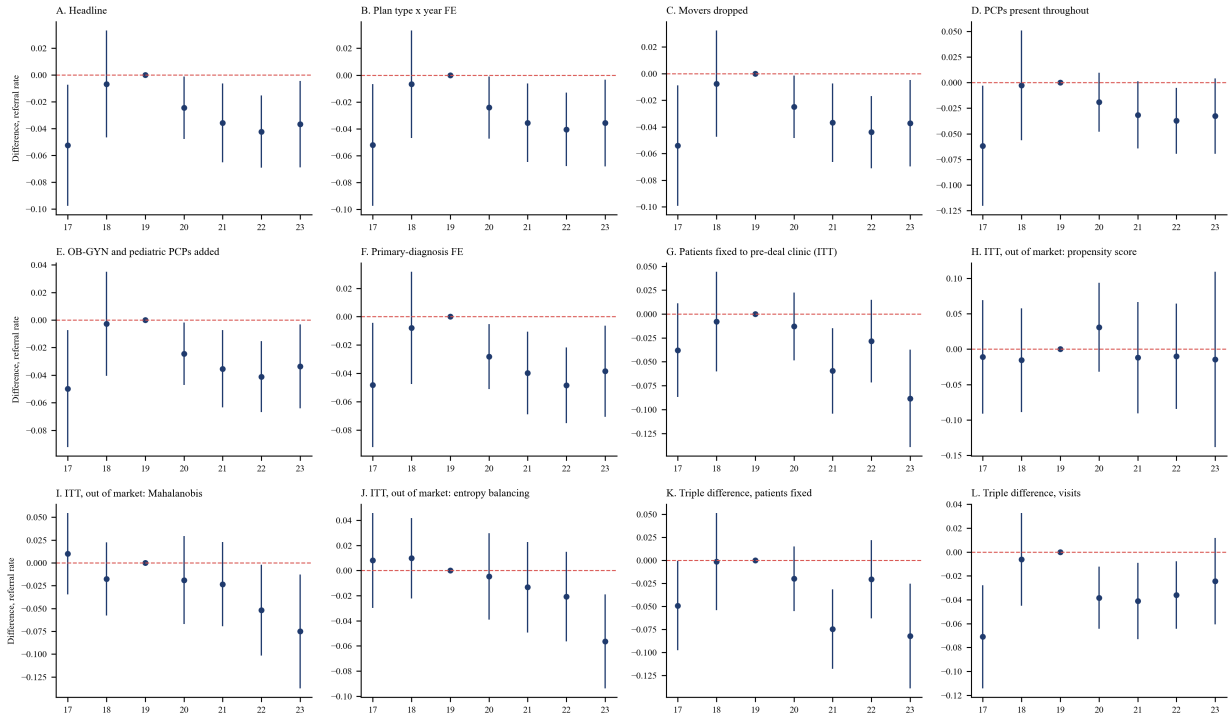


Figure 15: Specialist referrals of the VI insurer's MA enrollees: robustness

Notes: Event studies of the rows of Table 25; panel letters as in the table's last column. 2019 omitted; 95 percent confidence intervals, standard errors clustered by PCP.

Table 25: Referrals of the VI insurer's patients: robustness

	VI × Post						
Check	2021–23	2022–23	Pre-trend p	Observations	Patients	Clusters	Event study
Headline	-0.022^{**}	-0.023^{**}	0.06	54,554		114	A
	(0.010)	(0.011)					
Plan type × year FE	-0.021^{**}	-0.022^{**}	0.06	54,554		114	B
	(0.010)	(0.011)					
Movers dropped	-0.022^{**}	-0.024^{**}	0.05	53,855		109	C
	(0.010)	(0.011)					
PCPs present throughout	-0.018^{*}	-0.022^{*}	0.10	43,089		72	D
	(0.011)	(0.012)					
OB-GYN and pediatric PCPs added	-0.022^{**}		0.04	58,304		150	E
	(0.010)						
Primary-diagnosis FE	-0.026^{**}	-0.032^{***}	0.09	54,396		114	F
	(0.010)	(0.011)					
Patients fixed to pre-deal clinic (intention to treat, ITT)	-0.044^{***}	-0.048^{***}	0.26	26,206	2,133	105	G
	(0.014)	(0.016)					
ITT, out of market: propensity score	−0.009	−0.002	0.92	17,049	1,559	92	H
	(0.023)	(0.032)					
ITT, out of market: Mahalanobis	-0.040^{**}	-0.057^{***}	0.42	26,727	2,534	159	I
	(0.017)	(0.020)					
ITT, out of market: entropy balancing	-0.029^{**}	-0.038^{***}	0.83	62,078	5,149	408	J
	(0.012)	(0.014)					
Triple difference, patients fixed	-0.045^{***}	-0.038^{**}	0.07	216,261		111	K
	(0.014)	(0.016)					
Triple difference, visits	−0.015	−0.013	0.004	177,692		116	L
	(0.011)	(0.012)					

Notes: Each row is one regression of a new-patient visit to a referable specialist within 90 days of a primary care visit. Headline (Table 24): the VI insurer's Medicare Advantage enrollees' visits with ever-VI-clinic PCPs against independent PCPs in the same market, PCP and year fixed effects, age and sex controls. Plan type × year, movers dropped, PCPs present throughout, OB-GYN and pediatric PCPs added (separate roster run, Post = 2021–23 only), and primary-diagnosis FE (Table 29) change only what the row says. ITT rows: patients assigned to the VI clinics or independents by their 2018–19 primary care visits and kept there, patient and year fixed effects; out-of-market rows use matched practices in other markets, weighted by the match. Triple differences: the VI insurer's minus rival insurers' change at the VI clinics, against the same at independents. Event study: panel of Figure 15 (base year 2019). Standard errors clustered by PCP in parentheses. Clusters are the patients' attachment PCPs in the regression sample (VI and matched); the out-of-market match itself gives positive weight to 40 (propensity score), 125 (Mahalanobis), and 506 (entropy balancing) PCPs. $^{*}p<.10$, $^{**}p<.05$, $^{***}p<.01$

C.2.2 Payment-relevant and other diagnosis codes

Table 26 splits the diagnosis codes on the VI clinics' claims, and on all claims, into codes that map to a CMS-HCC payment category and all other codes, using the main coding design.

Table 26: Payment-relevant and other diagnosis codes

	All of the VI insurer's MA plans		Excluding one plan	
	VI insurer × Post	Mean 2019	VI insurer × Post	Mean 2019
Payment-relevant, VI clinics' claims	0.045	1.44	0.057	1.27
	(0.044) [0.05]	(+3.1%)	(0.046) [0.11]	(+4.5%)
Other, VI clinics' claims	−0.323*	8.97	−0.190	8.81
	(0.171) [0.01]	(−3.6%)	(0.202) [0.04]	(−2.2%)
Payment-relevant, all claims	0.071	2.89	0.020	2.62
	(0.095) [0.12]	(+2.5%)	(0.104) [0.10]	(+0.7%)
Other, all claims	−0.789***	16.70	−0.823**	16.83
	(0.285) [0.61]	(−4.7%)	(0.315) [0.00]	(−4.9%)

Notes: Distinct diagnosis codes per patient-year on face-to-face claims. Payment-relevant codes map to a CMS-HCC (V24) category; other codes do not. Same design as Table 6, column 2 (treatment from 2022, post 2022–23 vs. 2019). Excluding one plan drops the patient-years of the VI insurer's Medicare Advantage plan whose claims are reported mainly in 2020–21. Below each estimate: standard error clustered by the patient's main PCP in parentheses and the pre-trend p-value in brackets; below each mean: the estimate as a percent of the 2019 mean. $^{*}p<.10$, $^{**}p<.05$, $^{***}p<.01$

C.2.3 Conditions recorded only by the VI clinics

This check uses the annual-attribution panel and specification of Table 7, row 4, rather than the main coding design: patients are attributed to practices each year by their office visits, with patient, PCP, practice-by-year, and practice-by-VI-insurer fixed effects, age, sex, insurer, and plan-type controls, and a control for rival-insurer capitation; standard errors are clustered by PCP, and 2019 is the base year (51,952 patient-years, 13,150 patients, 68 PCPs, which are the clusters). The outcome is a count of payment categories rather than the risk score. For each patient-year I count the CMS-HCC payment categories that the VI clinics record and no other provider records that year, and those that the clinics and another provider both record. Over 2022–23, categories recorded only by the VI clinics rise by 0.103 per patient-year (standard error 0.032), 26 percent of the 2019 mean of 0.395; the joint pre-trend test does not reject ($p = 0.35$), but the 2020 coefficient, 0.07, is statistically significant, two years before the 2022 rise, so this measure may begin to rise early (Appendix Figure 13, panel R); categories recorded by both fall by 0.061 (standard error 0.028), and categories recorded only by other providers do not change (0.005, standard error 0.050). The clinics' additional codes are therefore conditions that no other provider records, not duplicates of conditions already recorded elsewhere.

C.2.4 Care received by the VI insurer's enrollees

Table 27 and Figure 16 report the care the VI insurer's MA enrollees receive relative to rival insurers' MA enrollees at the VI clinics, on the design of Table 6 with treatment dated from the

acquisition (2020). The main specification keeps only patients observed both before and after the acquisition; the second column keeps all patients.

C.2.5 Hospital and urgent care use

Fewer referrals could harm the VI insurer's enrollees if they delayed care that keeps them out of the hospital. Table 28 shows no change in their hospital admissions, preventable admissions, or urgent care visits relative to rival insurers' enrollees of the same PCPs, or relative to the same comparison at independent practices. I do not observe mortality.

C.2.6 Emergency department use: event study

Figure 17 shows the event study behind the emergency department estimate in Section 4.4.2.

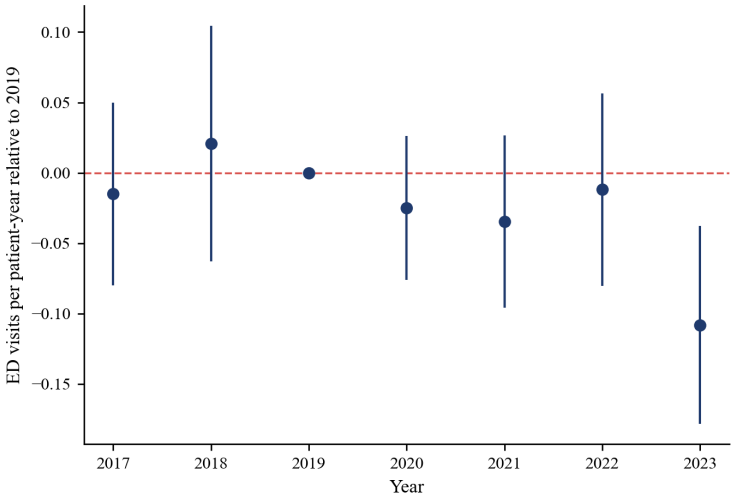


Figure 17: Emergency department visits of the VI insurer's MA enrollees at the VI clinics

Notes: Event study of emergency department visit-days per patient-year, the VI insurer's MA enrollees relative to rival insurers' MA enrollees at the VI clinics, on the design of Appendix Table 27, column 1: patients observed both before and after the acquisition, treatment dated from 2020, patient and year fixed effects. 47,573 patient-years; 2,798 VI-insurer and 4,684 rival patients; 99 PCP clusters. 2019 omitted; 95 percent confidence intervals, standard errors clustered by the patient's main PCP.

C.2.7 Raw referral rates

Table 27: Care received by the VI insurer's MA enrollees at the VI clinics

	(1) Patients seen before and after		(2) All patients	
	Estimate	%	Estimate	%
Primary care visits	0.178*	+5.8	0.205**	+7.1
	(0.091) [0.30]		(0.103) [0.06]	
Problem-oriented visits	0.149	+5.1	0.182*	+6.6
	(0.090) [0.40]		(0.102) [0.10]	
Annual wellness visits	0.105***	+19.9	0.115***	+24.6
	(0.015) [0.00]		(0.015) [0.00]	
Preventive visits	−0.023**	−25.7	−0.024**	−28.8
	(0.010) [0.30]		(0.010) [0.23]	
Vaccinations	−0.007	−1.9	0.006	+1.9
	(0.016) [0.00]		(0.016) [0.00]	
Screenings	−0.011	−13.6	−0.007	−9.7
	(0.008) [0.00]		(0.008) [0.00]	
Specialist visits	0.094	+3.3	0.141	+4.9
	(0.100) [0.02]		(0.101) [0.00]	
Emergency department visits	−0.045*	−12.3	−0.026	−5.8
	(0.024) [0.82]		(0.025) [0.82]	
Any emergency department visit (share)	−0.018	−8.5	...	
	(0.011) [0.77]			
Two or more emergency department visits (share)	−0.007	−9.5	...	
	(0.008) [0.53]			
Procedures	−0.395***	−8.3	−0.380***	−7.9
	(0.105) [0.57]		(0.120) [0.39]	
Imaging	−0.368**	−12.0	−0.396**	−11.8
	(0.177) [0.37]		(0.170) [0.39]	
Lab tests	−0.710**	−6.9	−0.592*	−5.6
	(0.327) [0.00]		(0.338) [0.00]	
Inpatient stays	−0.024	−18.9	−0.004	−2.3
	(0.019) [0.84]		(0.020) [0.46]	
Outpatient facility days	−0.571***	−23.7	−0.651***	−23.4
	(0.201) [0.37]		(0.235) [0.56]	
Hospital outpatient days	−0.249***	−33.9	−0.255***	−31.4
	(0.060) [0.52]		(0.061) [0.16]	
Ambulatory surgery center days	−0.064***	−24.0	−0.056***	−22.4
	(0.016) [0.86]		(0.016) [0.43]	
Days with any care	−1.625***	−8.5	−1.671***	−8.5
	(0.457) [0.24]		(0.498) [0.30]	
Allowed $, total	−1,219**	−13.5	−830	−8.6
	(571) [0.53]		(632) [0.11]	
Allowed $, inpatient	−541**	−29.3	−312	−14.5
	(270) [0.68]		(278) [0.98]	
Allowed $, outpatient facility	−183	−9.3	−99	−4.8
	(189) [0.86]		(223) [0.67]	
Allowed $, hospital outpatient	−75	−6.0	−53	−4.0
	(157) [0.40]		(173) [0.55]	
Allowed $, ambulatory surgery center	−21	−6.9	−4	−1.2
	(45) [0.45]		(42) [0.16]	
Allowed $, professional	−493	−9.4	−417	−7.7
	(345) [0.04]		(365) [0.01]	
Observations (patient-years)	47,573		69,665	

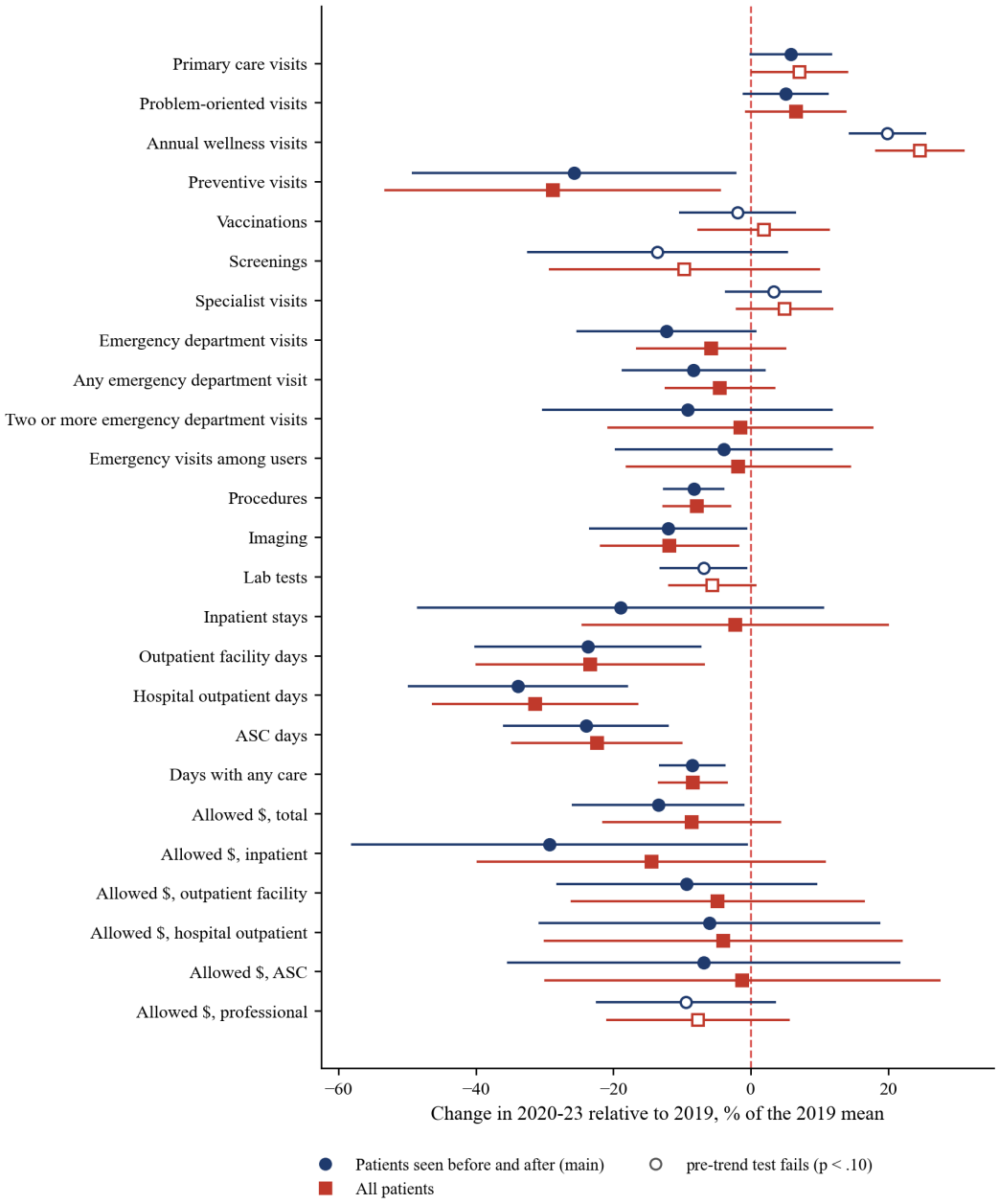


Figure 16: Care received by the VI insurer's MA enrollees at the VI clinics, as a percent of the 2019 mean

Notes: Estimates from Table 27: change in 2020–23 relative to 2019, as a percent of the VI insurer's enrollees' 2019 mean, with 95 percent confidence intervals. Navy circles: patients observed both before and after the acquisition (main specification); red squares: all patients. Hollow markers: the pre-trend test fails ($p < 0.10$). ASC: ambulatory surgery center.

Table 28: Hospital and urgent care use of the VI insurer's MA enrollees at the VI clinics

	Within PCPs		Relative to independent practices			
	(1)	(2)	(3)	(4)	Mean	Pre-trend p
Hospital admissions	−0.0068	−0.0023	0.0099	0.0311	0.182	0.507
	(0.0192)	(0.0234)	(0.0308)	(0.0372)		
Preventable admissions (PQI composite)	0.0003	0.0016	0.0029	0.0005	0.023	0.280
	(0.0067)	(0.0083)	(0.0085)	(0.0116)		
Length of stay, days (per admission)	−1.3498	−1.4001	2.6369*	2.7362*	10.082	0.004
	(0.9898)	(1.0322)	(1.5185)	(1.6307)		
Emergency department visits	−0.0392	−0.0251	0.1125	0.1934	0.457	0.933
	(0.0348)	(0.0407)	(0.0953)	(0.1167)		
Emergent, preventable or avoidable	−0.0027	0.0016	0.0043	0.0132	0.041	0.351
	(0.0060)	(0.0075)	(0.0151)	(0.0172)		
Emergent, primary-care treatable	−0.0007	0.0059	0.0196	0.0409*	0.099	0.225
	(0.0103)	(0.0110)	(0.0199)	(0.0231)		
Urgent care visits	−0.0119	−0.0008	−0.0412	−0.0242	0.118	0.824
	(0.0187)	(0.0214)	(0.0353)	(0.0404)		
Emergent, preventable or avoidable	−0.0001	−0.0000	−0.0008	0.0008	0.009	0.869
	(0.0019)	(0.0025)	(0.0055)	(0.0064)		
Emergent, primary-care treatable	−0.0016	−0.0012	−0.0060	−0.0027	0.031	0.538
	(0.0063)	(0.0074)	(0.0116)	(0.0144)		
Observations (patient-years)	42,635	34,046	69,653	54,248		
VI insurer (A) or VI clinics (B) | rivals (A) or independents (B)	9,679 | 32,956	6,241 | 27,805	42,922 | 26,731	34,320 | 19,928		
Patients, VI insurer (A) or VI clinics (B) | rivals (A) or independents (B)	3,930 | 10,304	2,896 | 9,582	12,529 | 8,446	11,287 | 6,969		
PCP-years, VI insurer (A) or VI clinics (B) | rivals (A) or independents (B)	312 | 316	257 | 261	317 | 198	262 | 162		
PCPs, VI insurer (A) or VI clinics (B) | rivals (A) or independents (B)	67 | 68	67 | 68	68 | 46	68 | 45		
PCP clusters	68	68	113	112		
Post years	2021–23	2022–23	2021–23	2022–23		

Notes: This table presents difference-in-differences estimates of hospital and urgent care use per patient-year for Medicare Advantage patients of PCPs at the VI clinics, on the sample of the coding analysis. Columns 1 and 2 compare the VI insurer's MA enrollees with rival insurers' MA enrollees of the same PCPs. Columns 3 and 4 compare the same gap at the VI clinics with the gap at independent practices in the same county. Post compares 2021–23 (columns 1 and 3) or 2022–23 (columns 2 and 4) with 2017–19. Preventable admissions are the composite of the Agency for Healthcare Research and Quality's Prevention Quality Indicators; emergency and urgent care visits are classified with the New York University algorithm. All columns include patient fixed effects. Mean is the outcome mean per patient-year. The pre-trend test is the joint test that the 2017 and 2018 event-study coefficients of the within-PCP comparison, relative to 2019, are zero. Standard errors clustered by PCP in parentheses. $^{*}p<.10$, $^{**}p<.05$, $^{***}p<.01$

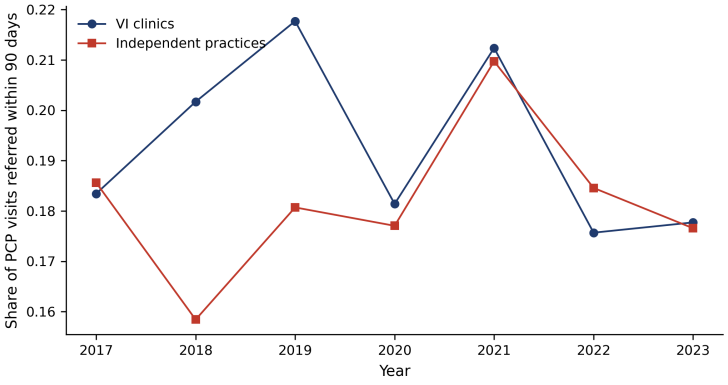


Figure 18: Raw referral rates of the VI insurer's MA enrollees, VI clinics and independent practices

Notes: Share of primary care office visits of the VI insurer's MA enrollees followed within 90 days by a new-patient visit to a referable specialist, by year. Unlike the regression outcome, the series counts every referable specialty, including dermatology, ophthalmology, podiatry, and allergy. No controls or fixed effects.

C.2.8 Referrals for the same presenting complaint

Table 29 and Figure 19 add fixed effects for each visit's primary diagnosis to the referral comparison of Section 4.4.2. The decline among the VI insurer's enrollees is slightly larger, −0.026 (standard error 0.010), the placebo stays flat, and the mix of complaints these enrollees bring does not change after the acquisition. The pre-trend test remains borderline ($p = 0.09$), so this check rules out a change in case mix, not mean reversion.

Table 29: Referrals for the same presenting complaint: the referral effect with diagnosis fixed effects

	VI insurer's MA patients		Rival insurers' MA patients (placebo)	
	(1)	(2)	(3)	(4)
VI × Post (2021–23)	−0.022**	−0.026**	−0.004	−0.006
	(0.010)	(0.010)	(0.007)	(0.007)
VI × Post (2022–23)	−0.023**	−0.032***	−0.007	−0.011
	(0.011)	(0.011)	(0.008)	(0.008)
Pre-trend p	0.06	0.09	0.30	0.38
Mean referral rate, VI clinics, 2017–19	0.166	0.166	0.157	0.157
Visits, Post = 2021–23 (2020 out)	54,554	54,396	123,138	122,980
Visits, event study (2017–23)	66,931	66,777	147,167	147,003
Clusters (PCPs)	114	114	116	116
Diagnosis FE		✓		✓
Balance: did the complaint mix change?				
Expected referral rate given the diagnosis		0.0022		0.0024*
		(0.0021)		(0.0013)

Notes: Visit-level difference-in-differences: primary care visits of Medicare Advantage patients with ever-VI-clinic PCPs against independent PCPs in the same market, columns (1)–(2) the VI insurer's enrollees, columns (3)–(4) rival insurers' enrollees (placebo). Outcome: a new-patient visit to a referable specialist within 90 days. Every column has PCP and year fixed effects (and insurer fixed effects in the placebo) and age and sex controls; columns (2) and (4) add fixed effects for the visit's primary diagnosis (ICD-10 category, first three characters; 1,293 categories). Column (1) is the headline. Post = 2021–23 leaves out 2020; Post = 2022–23 leaves out 2020 and 2021. Balance: each visit's expected referral rate given its diagnosis (the 2017–19 rate of that diagnosis among independent PCPs' visits) regressed on VI × Post (2021–23), same fixed effects and controls. The pre-trend p tests that the 2017 and 2018 event-study coefficients are jointly zero (base year 2019; Figure 19). Standard errors clustered by PCP in parentheses. *p<.10, **p<.05, ***p<.01

C.2.9 Referrals in commercial insurance

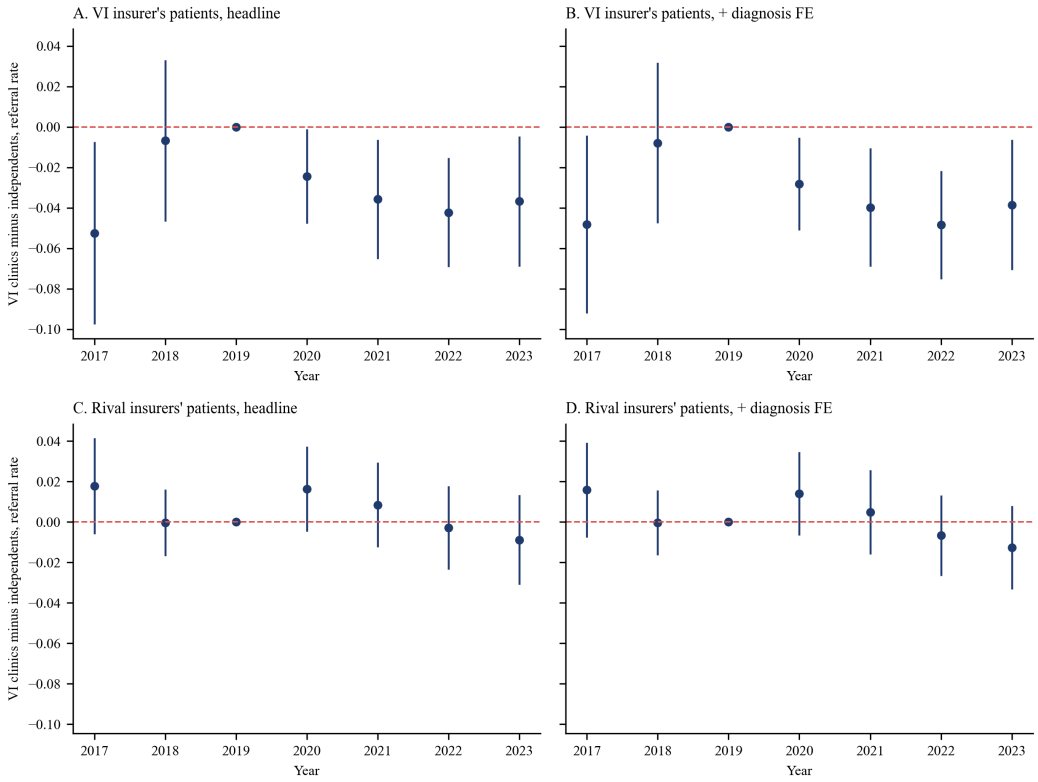


Figure 19: Specialist referrals with diagnosis fixed effects, VI clinics vs. independent practices

Notes: Event studies of the specifications in Table 29: the VI insurer's MA patients (top) and rival insurers' MA patients (bottom, placebo), without (left) and with (right) primary-diagnosis fixed effects. 2019 omitted; 95 percent confidence intervals, standard errors clustered by PCP.

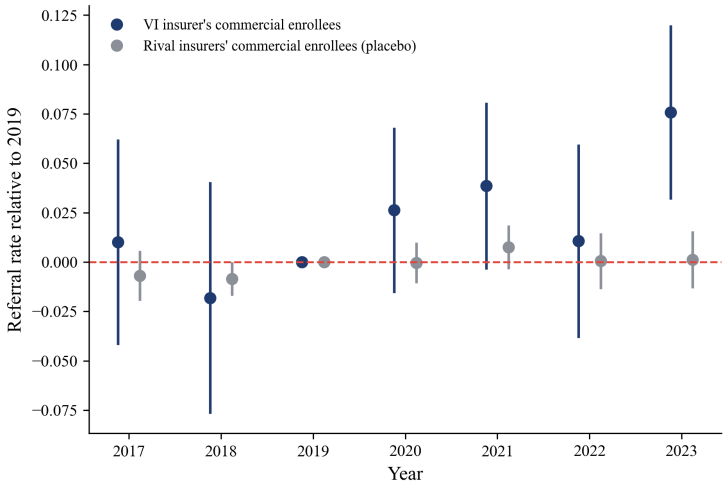


Figure 20: Specialist referrals of commercial enrollees, VI clinics vs. independent practices

Notes: As Figure 14, for the VI insurer's commercial enrollees and rival insurers' commercial enrollees (placebo). 2019 omitted; 95 percent confidence intervals, standard errors clustered by PCP. 12,535 visits and 122 PCPs (VI insurer's commercial); 403,295 visits and 128 PCPs (rival commercial).

Table 30: Specialist referrals after the acquisition, commercial patients: VI-clinic PCPs vs. independent-practice PCPs

	VI insurer's enrollees		Rival insurers' enrollees (placebo)	
		Linear pre-trend removed		Linear pre-trend removed
	(1)	(2)	(3)	(4)
VI × Post (2021–23)	0.0414***	0.0429	0.0085	−0.0103
	(0.0154)	(0.0586)	(0.0055)	(0.0124)
VI × Post (2022–23)	0.0426**	0.0447	0.0053	−0.0147
	(0.0194)	(0.0662)	(0.0064)	(0.0142)
Pre-trend test, p-value	0.527		0.148	
Pre-period referral rate, VI PCPs	0.093	0.093	0.109	0.109
Observations (PCP visits)	12,535	15,286	403,295	476,549
VI clinics | independent practices	8,545 | 3,990	10,430 | 4,856	271,617 | 131,678	320,748 | 155,801
Patients, VI clinics | independent practices	2,874 | 1,447	3,120 | 1,615	52,865 | 29,265	54,898 | 30,750
PCP-years, VI clinics | independent practices	359 | 188	432 | 228	367 | 225	441 | 269
PCPs, VI clinics | independent practices	75 | 47	75 | 49	75 | 53	75 | 55
PCP clusters	122	124	128	130
Linear pre-trend removed	No	Yes	No	Yes
PCP and year FE	Yes	Yes	Yes	Yes
Patient controls (age, sex)	Yes	Yes	Yes	Yes

Notes: This table presents difference-in-differences estimates of specialist referrals by primary care providers (PCPs) ever at the VI clinics, relative to PCPs at independent practices in the same county. Each observation is a PCP office visit of a commercial patient. The outcome is one if the patient has a new-patient visit with a specialist within 90 days, excluding dermatology, ophthalmology, podiatry, and allergy, which patients reach without a referral. Columns 1 and 2 use the VI insurer's enrollees; columns 3 and 4, a placebo, use rival insurers' enrollees. Columns 2 and 4 remove a linear pre-trend: a line fitted to the 2017 and 2018 event-study coefficients (relative to 2019) is subtracted from the post-period coefficients, so their sample is the event-study sample; because the line rests on two pre-period years, these columns show whether the change survives the trend, not its size. VI × Post compares 2021–23 with 2017–19, leaving out 2020; the second row compares 2022–23 with 2017–19, leaving out 2020 and 2021. All columns include PCP and year fixed effects and controls for patient age and sex. The pre-trend test is the joint test that the 2017 and 2018 event-study coefficients, relative to 2019, are zero. Standard errors clustered by PCP in parentheses. Wild cluster bootstrap p-values (restricted, Webb weights, 9,999 replications) give the same conclusions. $^{*}p<.10$, $^{**}p<.05$, $^{***}p<.01$

C.3 Sample

C.3.1 Primary care clinicians missing from the hand-audited list

The main sample is a hand-audited list of primary care clinicians. Applying the statewide directory's rules to the same market (a primary care role that year, billing at the VI clinics or at an independent practice in the county, and at least one year before and one year after 2020) identifies 42 clinicians the list omits: 10 at the VI clinics, 8 of them obstetrician-gynecologists in their women's health department, and 32 at independent practices, mostly obstetrics and gynecology and pediatric groups. The earlier rosters from which the list was built did not count these specialties as primary care. Table 31 reports every main estimate with these clinicians added, which brings the sample to 87 PCPs at the VI clinics and 86 at independent practices. Every estimate but one stays within about one standard error of the main estimate. The exception is the VI insurer's commercial price at its own clinics across all services, which falls from 5.0 to 3.0 log points, about 1.3 standard errors; its pre-trend test passes in both samples.

Table 31: Robustness: adding PCPs the hand audit missed

	Main sample (1)	With 42 added PCPs (2)
Rival insurers, commercial office visit: VI × Post	+8.88	+8.31
	(0.61)	(0.58)
Pre-trend p	0.00	0.00
Observations; patients; PCPs, VI | controls	125,606; 43,417; 77 | 51	138,379; 47,259; 87 | 82
VI insurer at its own clinics, MA, all services	+0.91	+0.77
	(0.36)	(0.36)
Pre-trend p	0.11	0.17
Observations; patients; PCPs, VI | controls	134,441; 8,768; 74 | 47	140,785; 9,269; 84 | 70
VI insurer at its own clinics, commercial, all services	+4.97	+3.03
	(1.50)	(1.24)
Pre-trend p	0.69	0.23
Observations; patients; PCPs, VI | controls	18,943; 4,037; 76 | 44	23,514; 4,852; 86 | 75
VI insurer at its own clinics, commercial office visit	+4.07	+5.02
	(2.37)	(2.14)
Pre-trend p	0.51	0.34
Observations; patients; PCPs, VI | controls	4,032; 2,078; 76 | 44	4,424; 2,263; 85 | 70
Referrals, VI insurer's MA: VI × Post	−2.15	−2.21
	(1.02)	(1.00)
Pre-trend p	0.06	0.04
Observations; patients; PCPs, VI | controls	54,554; 8,611; 67 | 47	58,304; 9,153; 77 | 73
Referrals placebo, rival MA: VI × Post	−0.37	−0.09
	(0.66)	(0.65)
Pre-trend p	0.30	0.29
Observations; patients; PCPs, VI | controls	123,138; 14,589; 67 | 49	132,326; 15,740; 77 | 75

Notes: This table reports the main estimates for the main sample (column 1) and with 42 PCPs added (column 2). The added clinicians are those the statewide clinician directory classifies as primary care who bill mainly at the VI clinics (10, including their obstetrician-gynecologists) or at an independent practice (32, including obstetrics and gynecology and pediatric practices) and are observed both before and after 2020. Each row uses the specification of the main text. The coding and care analyses assign patients to practices with the statewide clinician directory rather than the hand-audited roster, so they do not depend on the audit and are not reported here. Prices are in log points and referrals in percentage points (both times 100). Standard errors in parentheses.

D Out-of-Market Control Group

Independent practices in the VI clinics' county face the same insurers and patients as the VI clinics, which makes them a natural comparison, but for the same reason they may respond to the acquisition themselves, for example if rival insurers renegotiate their contracts with them when the VI clinics' prices rise. Cooper et al. (2025) exclude providers exposed to their rivals' integration from their controls for this reason. Following them, this appendix repeats the main estimates with controls drawn from outside the county: primary care providers (PCPs) at independent practices elsewhere in Oregon, selected by propensity-score matching on their 2017–19 characteristics.

I take the five nearest neighbors with replacement, matching exactly within clinician type and specialty, on the number of patients, the MA share and the VI insurer's share of patients, patient age and sex, visits per patient, the new-patient share, practice size, the MA plan mix, the share of visits coded at the two highest levels, and diagnoses per visit; I do not match on prices. The matched controls resemble the VI clinics' PCPs on these characteristics before the acquisition (Table 32), except in practice size, since the VI clinics are one large group, and in the level of prices.

Every regression is weighted by the control PCP's matching weight, and the specifications are those of the main text. A claim or visit counts only if the billing practice is the patient's main primary care practice that year, and out-of-market patients whose main practice was ever at the VI clinics are dropped. Table 33 and Figures 21–24 report the results.

The commercial price result replicates in sign: rival insurers' office-visit prices at the VI clinics jump in 2022 relative to the matched controls as well, by about 7 percent over 2022–23, against 13 percent with same-county controls. Out-of-market controls fail the pre-trend test, so I treat these estimates as a check on the sign of the effect, not its size. Across services billed by both groups, prices at the VI clinics also rise relative to the matched controls, by about 4 to 5 percent over 2022–23, against 8 percent with same-county controls. Rival MA prices rise by 1.7 percent over 2021–23 against every control group, and by 2.4 and 2.6 percent over 2022–23 (same-county and matched).

An out-of-market comparison for recorded risk is too imprecise to be informative (32 matched control PCPs; the 2022–23 estimate is 0.016, standard error 0.055, and the 2017 coefficient, 0.06, is statistically significant), so I read it as neither confirming nor contradicting the result (Appendix Table 23, row S). In commercial insurance, the 4-percentage-point rise in the VI insurer's commercial enrollees' referrals relative to same-county practices disappears against the matched controls (-0.3, standard error 2.0). The MA referral result does not replicate at the visit level: against the matched controls, the VI clinics' referral rate for the VI insurer's MA enrollees does not fall. The VI insurer has only a few hundred MA patients a year at the matched practices, so this comparison has little power. With patients fixed to their 2018–19 PCP group and insurer, as in Section 4.4.2, the referral rate of the VI insurer's MA enrollees falls over 2021–23 by 4.0 percentage points (standard error 1.7) against Mahalanobis-matched PCPs outside the county (125 PCPs) and by 2.9 points (standard error 1.2) with entropy-balancing weights (506 PCPs), with flat pre-periods ($p = 0.42$ and 0.83), while rival insurers' enrollees change by about +1 point. Against the propensity-score match, which

matches only 40 out-of-market PCPs, the estimate is −0.9 points (standard error 2.3).

Table 32: PCPs in 2017–19: VI clinics, same-county independent practices, and matched out-of-market practices

		Same-county	Matched	VI minus matched out-of-market		
	VI clinics	independents	out-of-market	Difference	(Standard error)	Std. difference
PCPs	64	38	40			
NP / PA share	0.281	0.263	0.281	0.000	(0.097)	0.00
Patients per PCP, all	752	418	718	34	(139)	0.07
Patients per PCP, commercial	528	274	531	−2	(103)	−0.01
Patients per PCP, MA	224	144	188	36	(42)	0.24
Patient age	48.9	55.1	46.9	2.0	(3.5)	0.11
Female patients (share)	0.593	0.586	0.608	−0.015	(0.025)	−0.12
MA risk score (practice-coded)	0.655	0.705	0.660	−0.005	(0.019)	−0.06
Office visit price, commercial ($)	274	208	238	36***	(5)	1.62
Office visit price, MA ($)	125	112	122	3	(3)	0.28
VI insurer's share of patients	0.058	0.090	0.052	0.006	(0.008)	0.19
Referral rate, MA visits	0.156	0.135	0.154	0.002	(0.014)	0.05
Other matching variables						
Visits per patient	1.49	2.16	1.63	−0.13*	(0.08)	−0.34
New-patient visit share	0.041	0.057	0.056	−0.016**	(0.008)	−0.42
Share of visits at the two highest levels	0.445	0.464	0.375	0.071	(0.055)	0.34
Diagnoses per visit	2.00	2.39	2.03	−0.04	(0.09)	−0.09
Practice size (PCPs)	68.9	6.9	43.2	25.7***	(2.2)	2.61
MA plan mix	0.441	0.495	0.467	−0.026	(0.058)	−0.13
Mean absolute standardized difference, matching variables		1.03	0.37			
Control PCPs used (effective number)		38	40 (26)			

Notes: This table compares primary care providers (PCPs) at the VI clinics with each control group on their 2017–19 averages; each PCP is one observation. The sample is the matching sample: PCPs with a PCP-year in their group in 2017–19 and a PCP-year in 2021–23. Column 2 is independent-practice PCPs in the same county (the main control group). Column 3 is independent-practice PCPs outside the county, weighted by their propensity-score matching weights (five nearest neighbors with replacement, no caliper, exact within clinician type and specialty). Columns 4–6 compare column 1 with column 3: the difference, its standard error (unequal variances; weighted variance of the control mean), and the standardized difference (the difference divided by the square root of the average of the VI and the weighted control variances). Patients are those with a commercial or Medicare Advantage (MA) office visit at the PCP's practice; the commercial and MA counts split them by the patient's main coverage. Prices are average allowed amounts, across all insurers, for an established-patient office visit of moderate complexity. The risk score and the referral rate are defined as in Table 1; the referral rate is computed on the referral regression samples. The match uses patients, the MA share, the VI insurer's share, patient age and sex, visits per patient, the new-patient share, practice size, the MA plan mix, coding intensity, and diagnoses per visit; prices are not matched on. The mean absolute standardized difference is taken over all matching characteristics and their 2017–19 changes. $^{*}p<.10$, $^{**}p<.05$, $^{***}p<.01$

Table 33: Main estimates with out-of-market control groups

	Independent practices, same county (1)	Matched out-of-market (2)
A. Prices (log points)		
Rival commercial office visit, VI × Post	0.089***	0.042***
	(0.006)	(0.009)
N; patients	125,606; 43,417	119,357; 47,241
PCP-years; PCPs, VI | control; clusters	580; 77 | 51; 127	573; 77 | 40; 117
VI × Post (2022–23)	0.130***	0.071***
	(0.008)	(0.011)
N; patients	106,650; 40,017	100,867; 42,970
PCP-years; PCPs, VI | control; clusters	481; 77 | 50; 126	471; 77 | 40; 117
Pre-trend test (p)	<0.01	<0.01
All rival MA contracts, VI × Post	0.017***	0.017***
	(0.003)	(0.003)
N; patients	86,264; 12,563	82,194; 15,951
PCP-years; PCPs, VI | control; clusters	523; 69 | 48; 116	473; 69 | 32; 101
VI × Post (2022–23)	0.024***	0.026***
	(0.003)	(0.004)
N; patients	70,758; 11,886	68,364; 14,916
PCP-years; PCPs, VI | control; clusters	430; 69 | 46; 114	388; 69 | 31; 100
Pre-trend test (p)	0.09	0.02
Rival commercial, all services, VI × Post	0.060***	0.019**
	(0.007)	(0.008)
N; patients	505,261; 77,237	474,143; 94,682
PCP-years; PCPs, VI | control; clusters	583; 77 | 53; 129	574; 77 | 40; 117
VI × Post (2022–23)	0.084***	0.043***
	(0.010)	(0.009)
N; patients	420,434; 73,349	398,425; 87,397
PCP-years; PCPs, VI | control; clusters	483; 77 | 52; 128	472; 77 | 40; 117
Pre-trend test (p)	0.01	<0.01
B. Specialist referrals (probability)		
VI insurer's MA, VI × Post	−0.022**	0.025
	(0.010)	(0.018)
N; patients	54,554; 8,611	34,316; 6,245
PCP-years; PCPs, VI | control; clusters	519; 67 | 47; 114	477; 67 | 36; 103
VI × Post (2022–23)	−0.023**	0.019
	(0.011)	(0.023)
N; patients	39,882; 7,674	25,050; 5,440
PCP-years; PCPs, VI | control; clusters[82]	428; 67 | 47; 114	387; 67 | 35; 102
Pre-trend test (p)	0.06	0.20
Rival MA (placebo), VI × Post	−0.004	0.006

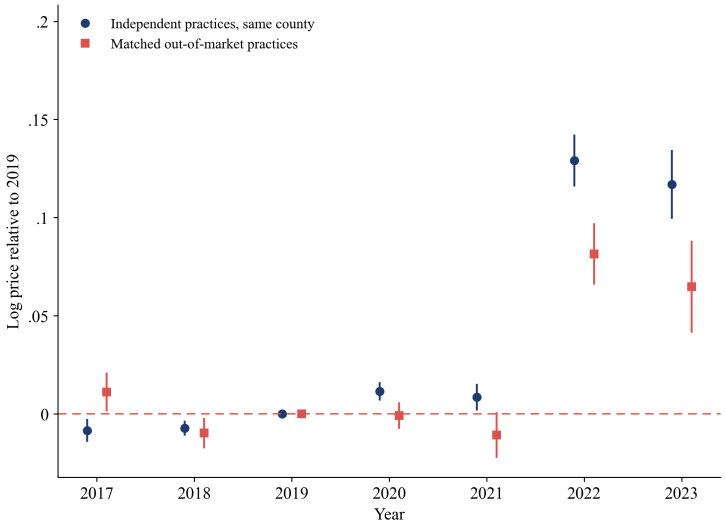


Figure 21: Rival insurers' commercial prices for office visits at the VI clinics: two control groups

Notes: Navy circles: independent practices in the same county (main estimates); red squares: matched out-of-market practices; out-of-market samples weighted by the matching weights. Specification as in Figure 1. 2019 omitted; 95 percent confidence intervals, standard errors clustered by PCP.

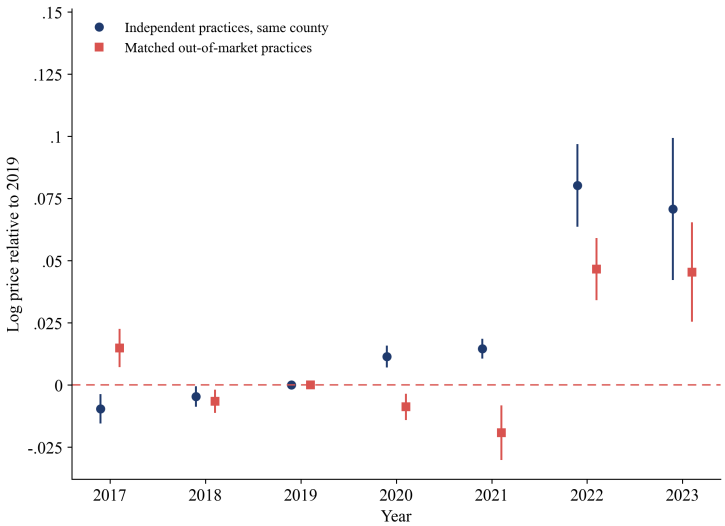


Figure 22: Rival insurers' commercial prices at the VI clinics, all services billed by both groups: two control groups

Notes: Markers as in Figure 21. Specification as in Figure 1b. 2019 omitted; 95 percent confidence intervals, standard errors clustered by PCP.

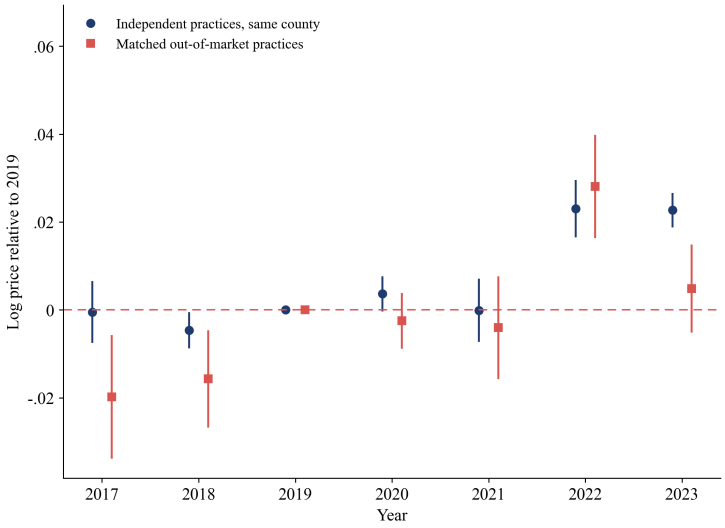


Figure 23: All rival insurers' MA prices for office visits at the VI clinics: two control groups

Notes: Markers as in Figure 21. Specification as in Figure 2. 2019 omitted; 95 percent confidence intervals, standard errors clustered by PCP.

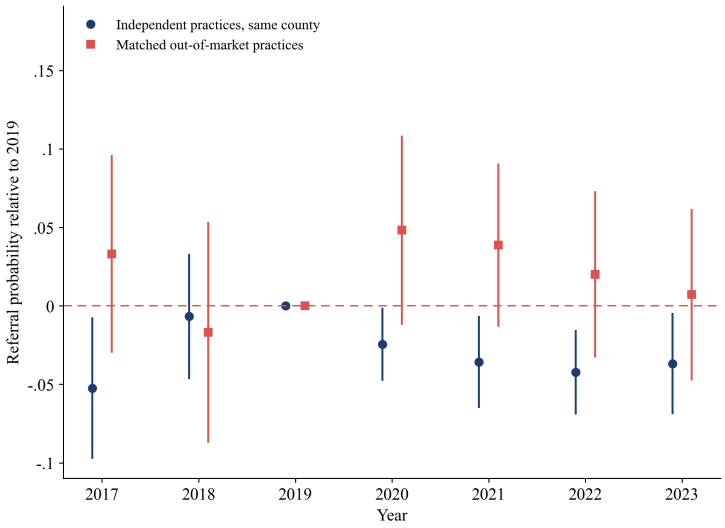


Figure 24: Specialist referrals of the VI insurer's MA enrollees: two control groups

Notes: Markers as in Figure 21. Specification as in Figure 14, VI insurer's MA enrollees only. 2019 omitted; 95 percent confidence intervals, standard errors clustered by PCP.

E A Model of an Integrated Insurer and Practice

E.1 The framework in words

This subsection describes in words how integration changes the incentives of an insurer and a primary care practice; the arguments follow the standard bargaining framework of the health care literature (Ho and Lee, 2017), and the rest of this appendix writes them down. The within-network steering channel behind Prediction 3 is argued in words only. In the bargaining framework, each insurer and practice sets its price by Nash bargaining, and the price splits the gains from trade between them. The price therefore depends on each side's disagreement payoff, its profit if the two fail to agree: it rises with the practice's disagreement payoff and falls with the insurer's. Integration changes these disagreement payoffs, and it changes how the practice's physicians treat the owner's enrollees, because the integrated firm now cares about the insurer's revenue and spending and about the practice's revenue together. I describe the framework for Medicare Advantage (MA), where the government pays insurers more for enrollees with more recorded diagnoses; commercial insurance is the same framework without that coding channel.

The price rival insurers pay. When a rival insurer and an independent practice fail to agree, some of the rival's enrollees who want to keep seeing their doctor switch to an insurer that still covers the practice. The practice keeps these patients, but it is now paid the price it negotiated with their new insurer. When the practice is owned by an insurer, some of the enrollees who switch may join the owning insurer's own plans. The integrated firm then earns two margins on each of them: the insurance margin, premium revenue net of medical spending, and the practice's margin on the care its physicians provide. The integrated practice's disagreement payoff is therefore higher than an independent practice's, so the rival insurer must pay more. The markup is larger the more of the rival's enrollees would follow the practice, and the larger the owner's margin on each.

The price the owner pays hospitals. PCPs are gatekeepers: they decide whether a patient is referred to downstream care and to which hospital. Hospital prices vary widely within an insurer's network (Cooper et al., 2019), so where PCPs refer matters for what an insurer spends. An insurer that employs its enrollees' PCPs can direct their referrals among in-network hospitals by price. A hospital that holds out for a high rate then risks losing patients to cheaper hospitals in the network, so the threat of steering pushes the negotiated price toward the low end of the range both sides would accept (Gowrisankaran et al., 2015; Prager, 2020). The threat is credible only if hospitals compete. A second force works the other way. The integrated firm earns both the insurance margin and the practice's margin on each enrollee, so each enrollee is worth more to it than to an independent insurer. The enrollees who would leave to keep the hospital therefore cost the integrated firm more, which lowers its disagreement payoff and raises the price the hospital can demand. Which force dominates depends on how many referrals the employed PCPs can steer and to where. Lower hospital prices, one of the largest potential benefits of this kind of integration, are

therefore not guaranteed.

Premiums. Before the acquisition, the insurer pays the practice a negotiated price that includes the practice's markup over its cost, and the insurer adds its own markup in the premium. Once the insurer owns the practice, the price it pays the practice is a transfer within the firm, so the firm's cost of the practice's services is the practice's actual cost. This elimination of double marginalization on practice services is the main efficiency argument for integration. The insurer's premium falls relative to rival insurers' only if the integrated firm's real costs fall, through the elimination of double marginalization on practice services, fewer referrals, or lower hospital prices, and the firm passes the saving on to its enrollees. Rival insurers, meanwhile, pay the integrated practice more, and their premiums rise with that cost.

Coding and referrals. An independent practice paid a fee for each service gains nothing from an insurer's risk-adjusted revenue and pays none of its hospital or specialist bills, so it has no reason to record more diagnoses than a patient's condition warrants or to refer less than is appropriate. A practice owned by the insurer is in a different position for the owner's enrollees. In MA, each additional diagnosis it records raises the government's payment to its owner, so it records more of them, up to the point where the extra effort and audit risk outweigh the gain. Each referral adds to its owner's spending, so it refers less, up to the point where the cost of missed diagnoses outweighs the saving. Neither incentive applies to rival insurers' enrollees at the same practice, whose revenue and spending the owner does not share; they provide a within-practice comparison. A capitated contract, which passes part of an insurer's revenue and spending to an independent practice, creates the same incentives in part; ownership passes them on in full.

The rest of this appendix presents the model behind the predictions of Section 4.1; it is deliberately simpler than the market it describes. Insurers and primary care clinics bargain over prices as in Ho and Lee (2017), whose notation and timing I follow throughout, and every insurer–clinic pair faces the standard bargaining terms. Integration changes the problem in two ways. The integrated pair cares about the insurer's spending and revenue in a way an independent clinic does not, and about the clinic's revenue in a way an independent insurer does not. These two externalities add terms to the integrated pair's agreements with rival insurers, and they change how its physicians code and refer the insurer's own enrollees.

E.2 Setup

Markets. I write the model for Medicare Advantage (MA), in which the government pays insurers more for enrollees with more recorded diagnoses. Commercial insurance is the same model with the coding channel shut down: the insurer's revenue per enrollee is a premium that does not depend on recorded diagnoses, while the price and referral channels are unchanged.

Players and demand. Primary care clinics are indexed by i (another clinic by h) and insurers by j (another insurer by n), with the clinic first in every subscript. The VI insurer a owns the VI clinic v, and the two maximize joint profit; I call them the VI pair. The VI clinics are a chain of clinics that bills, and bargains with each insurer, as one organization, so I model them as a single clinic. A rival insurer is any insurer $j \neq a$. All other insurers and clinics are independent. The network $\mathcal{G}$ is the set of clinic–insurer pairs with a contract. Given the network, insurance demand $D_j(\mathcal{G})$ is the number of insurer j's enrollees, and PCP demand $D_{ij}^P(\mathcal{G})$ is the number of insurer j's enrollees who visit clinic i, once each. Some enrollees never see a PCP, so $\sum_i D_{ij}^P \leq D_j$. Enrollment responds to the network because patients value access to their clinic.

Profits. Insurer j earns

$$\Pi_j = D_j\big(\phi_j^0 - \eta_j\big) + \sum_i D_{ij}^P\big[\phi_j(u_{ij} - \bar{u}) - p_{ij} - r_{ij}H_j\big], \tag{6}$$

which follows equation (1) of Ho and Lee (2017). ϕ_j^0 is the base payment the insurer receives per enrollee from the government (the premium, in commercial insurance), and η_j its administrative and other cost per enrollee; both accrue on every enrollee. Each patient has a true risk $\bar{u}(x)$ and an appropriate referral rate $\bar{r}(x)$, which depend on the patient's characteristics x; I write $\bar{u}$ and $\bar{r}$ for short. As in Finkelstein et al. (2016), each patient has a level of care set by their own characteristics, and physicians' incentives move care away from it at a cost that rises with the distance. $\phi_j(u_{ij} - \bar{u})$ is the additional government payment when clinic i reports risk u_{ij} for the enrollee, above the true risk, with $\phi_j(0) = 0$ and $\phi_j' > 0$ in MA and $\phi_j \equiv 0$ in commercial insurance. The insurer pays clinic i the price p_{ij}, and the clinic refers a share r_{ij} of the insurer's patients to the hospital, each at a cost H_j to the insurer. Clinic i earns

$$\Pi_i = \sum_j D_{ij}^P\big[p_{ij} - c_i - c^u(u_{ij} - \bar{u}) - c^r(r_{ij} - \bar{r})\big], \tag{7}$$

where c_i is the clinic's cost of a visit, $c^u(u - \bar{u})$ the cost of reporting risk u that departs from the true risk, with $c^u(0) = c^{u\prime}(0) = 0$ and $c^{u\prime\prime} > 0$, and $c^r(r - \bar{r})$ the cost of a referral rate that departs from the appropriate one (missed diagnoses if it refers too few, time if it refers too many), with $c^r(0) = c^{r\prime}(0) = 0$ and $c^{r\prime\prime} > 0$, so that it rises on both sides of $\bar{r}$. The convex costs are what limit how far a clinic will push coding or hold back referrals. I write $c_{ij}^u \equiv c^u(u_{ij} - \bar{u})$ and $c_{ij}^r \equiv c^r(r_{ij} - \bar{r})$. The VI pair earns $\Pi_a + \Pi_v$, in which the price p_{va} is a transfer within the firm and drops out.

Timing. In the first stage, three things happen simultaneously: each clinic–insurer pair bargains over its price, each insurer bargains with each hospital over the price it pays for a referred patient, and each insurer sets its premium (in MA, the premium and benefits it offers enrollees). Premiums are taken as given in each price negotiation, so the bargaining conditions below are unchanged, and prices are taken as given when premiums are set; the government's payment rates are fixed

throughout. In the second stage, each clinic chooses coding intensity and referrals for each insurer's patients.

E.3 Bargaining

Prices are set by Nash-in-Nash bargaining (Gowrisankaran et al., 2015; Ho and Lee, 2017): each pair's price maximizes the product of the two sides' gains from trade, with weight τ_j on insurer j (and $1-\tau_j$ on the clinic), holding the other prices fixed. A side's gain from trade is its profit with the agreement minus its profit without it. $[\Delta_{ij} D_j] \equiv D_j(\mathcal{G}) - D_j(\mathcal{G} \setminus ij)$ is the number of enrollees insurer j would lose, because they switch to other insurers to keep clinic i, if i and j failed to agree, and $[\Delta_{ij} D^P_{hn}] \equiv D^P_{hn}(\mathcal{G}) - D^P_{hn}(\mathcal{G} \setminus ij)$ is the corresponding change in insurer n's patients at clinic h. $[\Delta_{ij} D^P_{hn}]$ is negative for insurer j's patients who would move to another clinic h and for enrollees who would switch to insurer n and keep visiting i.

The standard terms. For a clinic and an insurer that are both independent, the gains from trade are

$$\begin{aligned}
\Delta\Pi_j &= [\Delta_{ij} D_j](\phi^0_j - \eta_j) + D^P_{ij}\big(\phi_j(u_{ij} - \bar{u}) - p_{ij} - r_{ij} H_j\big) \\
&\quad + \sum_{h \neq i} \big(\phi_j(u_{hj} - \bar{u}) - p_{hj} - r_{hj} H_j\big)[\Delta_{ij} D^P_{hj}], \\
\Delta\Pi_i &= D^P_{ij}\big(p_{ij} - c_i - c^u_{ij} - c^r_{ij}\big) + \sum_{n \neq j} [\Delta_{ij} D^P_{in}]\big(p_{in} - c_i - c^u_{in} - c^r_{in}\big),
\end{aligned}$$

and the price solves

$$\begin{aligned}
p_{ij} D^P_{ij} = (1-\tau_j)\Big[&\underbrace{[\Delta_{ij} D_j](\phi^0_j - \eta_j)}_{\text{enrollment}} + \underbrace{D^P_{ij}\big(\phi_j(u_{ij} - \bar{u}) - r_{ij} H_j\big)}_{\text{coding and referrals}} \\
&\underbrace{- \textstyle\sum_{h \neq i} \big(p_{hj} + r_{hj} H_j - \phi_j(u_{hj} - \bar{u})\big)[\Delta_{ij} D^P_{hj}]}_{\text{price reinforcement}} \Big] \\
+ \tau_j \Big[&\underbrace{D^P_{ij}\big(c_i + c^u_{ij} + c^r_{ij}\big)}_{\text{visit cost}} - \underbrace{\textstyle\sum_{n \neq j} [\Delta_{ij} D^P_{in}]\big(p_{in} - c_i - c^u_{in} - c^r_{in}\big)}_{\text{recapture}} \Big].
\end{aligned} \tag{8}$$

The insurer pays more for a clinic whose loss would cost it many enrollees and whose patients are expensive to serve elsewhere; the clinic receives more when its costs are high and when it would recapture many of the insurer's patients through other insurers. These are the terms in Ho and Lee (2017), and they apply to every pair that does not involve the VI pair. The same terms appear when an independent insurer bargains with a hospital: its price solves an equation of the same form as (8), with the hospital in place of the clinic. Because the hospital negotiations take place at the same time as the clinic negotiations, each pair takes the outcome of every other negotiation, including the hospital prices, as given.

The VI pair and a rival insurer. When a rival insurer $j \neq a$ and the VI clinic fail to agree, the enrollees who switch to keep the VI clinic can switch to the VI insurer, which then earns its margin on them. Assume that enrollees who switch to the VI insurer to keep the VI clinic visit it, so they number $-[\Delta_{vj} D^P_{va}]$. The VI pair's gain from the agreement is the clinic's standard gain plus $[\Delta_{vj} D^P_{va}]\, m_a \leq 0$, the VI insurer's margin on these switchers, and the price becomes

$$p_{vj} D^P_{vj} = \Big[\text{standard terms in (8)}\Big] - \underbrace{\tau_j \,[\Delta_{vj} D^P_{va}]\, m_a}_{\text{raising rivals' costs}}, \qquad m_a \equiv \phi^0_a + \phi_a(u_{va} - \bar{u}) - \eta_a - p_{va} - r_{va} H_a. \tag{9}$$

The extra term, raising rivals' costs, is the VI insurer's margin on each enrollee who would follow the VI clinic. An independent clinic recaptures such a patient only at another insurer's price; the VI clinic recaptures the patient as an enrollee of its owner. Disagreement therefore costs the VI pair less, and the rival insurer pays the VI clinic more:

$$\frac{\partial p_{vj}}{\partial m_a} = -\tau_j \, \frac{[\Delta_{vj} D^P_{va}]}{D^P_{vj}} > 0. \tag{10}$$

The markup rises with the number of the rival's enrollees who would follow the VI clinic and with the VI insurer's margin on each. The internal price p_{va} appears both in m_a and in the standard recapture term, and cancels: what moves the rival's price is the pair's margin per enrollee, m_a plus the VI clinic's margin $p_{va} - c_v - c^u_{va} - c^r_{va}$.

E.4 Coding and referrals

In the second stage, the VI pair chooses coding and referrals for its own enrollees at the VI clinic to maximize its margin per enrollee net of the clinic's costs, $\phi_a(u_{va} - \bar{u}) - r_{va} H_a - c^u(u_{va} - \bar{u}) - c^r(r_{va} - \bar{r})$:

$$u^{VI}_{va}: \quad \phi'_a(u^{VI}_{va} - \bar{u}) = c^{u\prime}(u^{VI}_{va} - \bar{u}), \qquad\qquad r^{VI}_{va}: \quad -c^{r\prime}(r^{VI}_{va} - \bar{r}) = H_a. \tag{11}$$

An independent clinic paid fee-for-service receives neither the insurer's risk-adjusted revenue nor its hospital bills, so it reports the true risk, $u = \bar{u}(x)$, and refers at the appropriate rate, $r = \bar{r}(x)$, for every insurer's patients, and so does the VI clinic for rival insurers' enrollees, whose revenue and hospital spending it does not internalize. For its owner's enrollees, the VI pair's choices depart from these levels: $r^{VI}_{va} < \bar{r}(x)$, so the VI clinic refers them less than is appropriate, and in MA $u^{VI}_{va} > \bar{u}(x)$, so it reports their risk above the truth. A capitated contract with an independent clinic, which passes part of the insurer's revenue and spending to the clinic, creates the same incentives in part; ownership passes them on in full. Both choices raise the pair's margin per enrollee, so by (10) they also raise the price the rival insurer pays the VI clinic.

E.5 From the model to the predictions

Equations (9) and (10) give Prediction 1 of Section 4.1, and Equation (11) gives Predictions 2 and 4. Prediction 3 follows from the hospital negotiation. The VI insurer's price at a hospital solves the same equation, (8), with the hospital in place of the clinic: the VI pair adds no term of its own. Ownership instead shifts existing terms: if the VI insurer and the hospital fail to agree, the hospital leaves the VI insurer's network, and the VI clinic refers the VI insurer's enrollees to hospitals still in that network, so fewer of them switch insurers to keep the hospital; these patients leave the enrollment and recapture terms of (8), which lowers the price, and enter the price-reinforcement term at the other hospital's price. Ownership also shifts the enrollment term the other way: an enrollee who leaves the VI insurer to keep the hospital costs the integrated firm not only the insurance margin $\phi_a^0 - \eta_a$ but also the VI clinic's margin on that enrollee, net of what the clinic recaptures if the enrollee stays with it through a rival insurer. This lowers the VI insurer's disagreement payoff and raises the price. The net effect is ambiguous: the first force is larger the more hospitals compete, and when hospitals face little competition, only the second remains. The model holds a hospital's volume under an agreement fixed, so it captures steering only through the disagreement point. It omits a second steering channel that the main text emphasizes: an insurer that employs PCPs can also direct referrals among in-network hospitals by price, so a hospital that holds out for a high rate loses volume. This makes the hospital's gain from an agreement fall with its price and pushes the bargained price down further, as patient cost-sharing does in Gowrisankaran et al. (2015). Extending the model so that referrals respond to hospital prices is the subject of ongoing work. Prediction 5 follows from the premium choice: each insurer's premium rises with its net cost per enrollee, and for the VI insurer the price p_{va} is a transfer that does not enter that cost.