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Physician Compensation In Physician-Owned And Hospital-Owned Practices

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Abstract

Physician practices are increasingly being acquired by hospitals and health systems. Despite evidence that this type of vertical integration is profitable for hospitals, the association between these acquisitions and the incomes of physicians in the acquired practices is unknown. We combined national survey data on physician practice ownership with data on physician income to examine whether hospital or health system ownership of physician practices was associated with differences in physician income during 2014–18. During the study period, hospital and health system ownership of physician practices increased by 89.2 percent, from 24.1 percent to 45.6 percent of all physicians in our sample. Among physician practices overall, vertical integration with hospitals or health systems was associated with, on average, 0.8 percent lower income compared with independent physicians after multivariable adjustment. In analyses by physician specialty, vertical integration of physician practices with hospitals or health systems was associated with lower income for nonsurgical specialists, no difference in income for primary care physicians, and slightly higher income for surgical specialists. Although vertical integration of physician practices is a rapidly growing trend, physicians might not directly benefit financially.

For the first time, more physicians now work for a hospital or a practice in which they do not have an ownership stake than own their own practice.¹ Hospital or health system ownership of physician practices increased rapidly between 2007 and 2017, ranging from ten-year growth of approximately 7 percent for dermatologists to more than 50 percent for oncologists.² This form of vertical integration has been linked to changes in hospital choice and referral patterns, higher prices and spending, and inconsistent changes in quality.^{3–10}

Despite evidence that this type of vertical integration is profitable for hospitals,^{11–15} little is known about the degree to which the income of physicians whose practices have been

acquired has been affected. The expected effect is uncertain. Joining a larger organization is frequently associated with increased compensation,¹⁶ which may be expected if some of the price increases associated with vertical integration are passed on to vertically integrated providers. Physicians who join larger systems may also be able to negotiate higher reimbursement rates with commercial payers, and physicians may receive a portion of this increase in prices.^{4,7,17,18} Other work has found higher physician earnings in markets in which physician labor markets are concentrated.¹⁹

Alternatively, vertical integration may lead to what economists term monopsony markets, in which concentrated employers face little competition for labor, which thus depresses worker compensation.²⁰ Outside of health care, monopsony markets are a broader point of policy focus as firms consolidate. Physician practices may integrate with hospitals or health systems because of concerns about losing referral privileges, difficulty implementing electronic health records (EHRs), or other administrative challenges. In these cases, physicians might not capture much, if any, of the increases in system profits that occur after integration.

Under these alternative scenarios, notwithstanding increases in hospital or health system profits after integration, physician compensation could increase, remain stable, or decrease. Related work finds that increases in hospital market power leads to reductions in wages for hospital employees, but despite the increasing prevalence of vertical consolidation, how it affects physician wages is not well understood.²¹

We combined national survey data on physician practice ownership with data on physician income to examine whether hospital and health system ownership of physician practices was associated with differences in physician income during 2014–18. Our data allowed us to link both annual compensation and practice ownership at the individual physician level, adjusting for physician and practice characteristics that may influence physician income.

Study Data And Methods

DATA SOURCES

To examine the association between hospital-physician integration and physician compensation, we used three sources of data. Data on physician compensation were obtained from the Career Navigator Survey administered by Doximity, an online social network for physicians and other health care providers that includes more than 70 percent of US physicians.²² Since 2014 Doximity has surveyed members on income,²³ with 102,129 physicians completing the compensation survey between 2014 and 2020, providing information on annual income, practice type (for example, hospital or group practice), and average hours worked per week. Income was reported in categories with increments of \$5,000 between \$40,000 and \$250,000 and increments of \$25,000 between \$250,000 and \$1,000,000. The analytic sample was restricted to 70,951 physicians reporting full-time medical practice (online appendix exhibit 1).²⁴ Details of the survey, including assessments of its validity, have been previously published.²⁵

Additional data on physicians were available from Doximity, which, for physicians who have and have not registered for the platform, has collected data from multiple data sources, including the Centers for Medicare and Medicaid Services (for example, provider identifiers assigned by the National Plan and Provider Enumeration System), state licensing boards, specialty societies, and medical schools. The database includes information on physician age, sex, specialty, medical school attended (name and type of training—that is, allopathic or osteopathic), years in practice, and practice location. Details and validation of the database have been described elsewhere.^{26–31}

We obtained information on practice ownership during the 2010–18 period from the SK&A Office-Based Physicians Database provided by IQVIA, a commercial database of health care providers,^{32,33} which provides a nearly complete sampling frame of US office-based physicians (greater than 95 percent coverage of office-based physicians, according to IQVIA).³⁴ Other studies have found that the database captures approximately 75 percent of US physicians.¹² SK&A data are collected through a national survey of physicians and their group practice affiliations. For group practices, the SK&A data list whether the practice is owned by a hospital or health system and, if it is owned, the owning entity. SK&A relies on self-reported information obtained during primary research phone calls to physician practices to determine the owning entity. We matched SK&A ownership data lagged one year to the Doximity data. For example, we matched 2014 Doximity physician compensation data with 2013 SK&A ownership data. We did this to ensure that we had the correct ownership information at the time of the Doximity survey. For instance, an independent physician whose practice was acquired by a health system in October 2014 but who had been surveyed by Doximity in January 2014 would be incorrectly labeled as vertically integrated at the time of survey if we were to match concurrent SK&A ownership data with the Doximity data. The SK&A database contains unique group and physician identifiers, which we used to link individual physicians for which salary information was available. Not all physicians with income data were surveyed in the SK&A database, and vice versa. Because some physicians may report several practice affiliations, we used the primary affiliation reported in the SK&A database to link physicians to groups. We were able to match physician employment with income for 41,648 full-time physicians (59 percent of those in the income surveys) (appendix exhibit 1).

ANALYSIS

We first compared specialty distributions and characteristics of physicians in the study population with those in the general US physician workforce to assess the national representativeness of physicians responding to the income survey. The study population had similar specialty distributions, Medicare patient characteristics, and Medicare billing as the US physician population (appendix exhibits 5–7).²⁴

We then measured the association between physician income and integration with hospitals or health systems, using multivariable regression models. We estimated a multivariable generalized linear model with a log-link and gamma-distributed error term of physician income (dependent variable) as a function of physician-level covariates, including years since medical school graduation, number of hours worked per week, and annual amount

billed to Medicare during 2013–18 (obtained from the Centers for Medicare and Medicaid Services), with the latter two variables accounting for potential differences among physicians in hours worked and clinical volume. Lagged measures of annual amount billed to Medicare (that is, during 2013–18) were matched to the 2014–19 compensation data. Also included in the model were indicator variables for physician specialty, Metropolitan Statistical Area indicator variables to adjust for time-invariant geographic factors that may be associated with physician income, year in which the physician completed the survey to adjust for time trends in both physician income and vertical integration, and a variable indicating whether the physician practiced in an independently owned practice or in a practice owned by a hospital or health system. The model estimated the average, adjusted difference in income between independent physicians and those in vertically integrated practices. Log-link models were chosen to account for known skewness in income,³⁵ and adjusted differences in income were calculated using the marginal standardization form of predictive margins.³⁶

SUBGROUP ANALYSIS

Different physician specialties may have different bargaining power with hospitals and health systems, which could result in a greater pass-through of hospital or health system profits to physicians in the form of higher income. We thus separately examined the association between vertical integration and physician income by physician specialty type (primary care, nonsurgical specialist, and surgical specialist) (a list of each specialist category is in appendix exhibit 2).²⁴ Specifically, we estimated the same baseline regression model described above with interaction terms between specialty type and an indicator for whether a physician practice was vertically integrated, allowing for a formal statistical test of interactions. We also examined differences between for-profit and nonprofit hospitals to assess whether physician income varied according to whether the acquiring hospital was for-profit or not. Nonprofit hospitals are commonly larger than for-profit hospitals, which may confer greater monopsony power. Nonprofits also may have less ability to pass on to providers any economic benefits that arise from vertical integration.^{37,38} In a modification of the baseline regression model, for-profit status was interacted with an indicator for whether a physician practice was vertically integrated, allowing for a formal test of interactions. Finally, we examined whether the relationship between physician income and vertical integration with a hospital differed according to the degree of competition in the hospital market, defined at the county level—an analysis conducted to assess whether monopsony behavior by acquiring hospitals, which may be stronger in markets with fewer hospitals (that is, more concentrated markets), would be offset by higher hospital prices and financial returns to vertical integration.^{17,39} Using data on hospital size from the American Hospital Association’s annual survey of hospitals, we applied concentration measures used by the Federal Trade Commission and the Department of Justice to measure market concentration.⁴⁰ We classified markets with a Hirschman-Herfindahl Index above 2,500 as concentrated.⁴¹ A formal test of interactions was again conducted.

ADDITIONAL ANALYSES

We conducted several additional analyses. First, our sample consisted of physicians who responded to an online survey and thus might not be representative of the broader US

physician population. We therefore assessed the sensitivity of our findings to applying nationally representative sampling weights based on physician sex, specialty, geography (county), and years since medical school graduation (see description in the appendix).²⁴

Second, physicians whose practices are acquired may differ in unobserved ways from physicians who remain in independent practice, even after multivariable adjustment. In this case, the relationship between vertical integration and physician income may be biased by unmeasured confounders. We addressed this concern in three ways. First, we estimated our regression models without adjusting for any characteristics (that is, an unadjusted analysis), under the assumption that the observed covariates in our model could be correlated with unmeasured confounders. Finding a similar association in the unadjusted and adjusted models might suggest that unmeasured confounders are less likely to be important. Second, we compared the incomes of physicians in independent versus vertically integrated practices, using propensity score methods (see appendix exhibits 11 and 12).²⁴ Third, we used linear regression models to test the sensitivity of our results to model choice. Fourth, we used the midpoint of compensation ranges, rather than the top value. Fifth, although we were unable to track the same physician before and after acquisition, we used an event study to compare income between physicians who were surveyed before and after acquisition, controlling for observable characteristics. The event study results should be interpreted as the difference in income between physicians whose practices were acquired in a given year, relative to when they completed the survey, and those whose practices were acquired in other years, relative to when they completed the survey, and both compared with changes among physicians who remained independent. This approach assumes that the timing of when a physician was surveyed and reported their income was unrelated to the timing of that physician's practice being acquired. We linked the year of practice acquisition in the SK&A data to the year in which income was reported by a physician in the income survey data. We then examined whether physician income differed based on the year for which income was reported relative to the year of practice acquisition. A difference in income for those physicians who happened to be surveyed after versus before a practice was acquired might suggest that any mean changes in physician income could be attributable to acquisition rather than unmeasured confounders.

Analysis was performed using Stata, version 17. The study was approved by the Institutional Review Board at the RAND Corporation.

LIMITATIONS

This study had limitations. First, self-reported data on physician compensation were obtained from a large online survey. Although voluntary participation in the survey may limit external validity, the survey is the largest survey of physician incomes to date, and assessments of its validity have been previously published.²⁵ A full description of the Doximity survey is in the appendix.²⁴ Moreover, similar findings were observed when we applied nationally representative sampling weights. Second, physician compensation was examined at a single point in time rather than longitudinally, precluding an assessment of income changes within physicians over time in practices that were versus were not acquired by hospitals or health systems. However, we conducted a modified event study analysis

that assumed that the timing of when a physician was surveyed and reported their income was unrelated to the timing of that physician's practice being acquired. We examined whether physician income differed based on the year for which income was reported relative to the year of practice acquisition and found no difference in income between physicians whose incomes were surveyed before versus after practice acquisition. Third, and relatedly, our study was observational, and although we adjusted for several factors that may influence physician income, residual confounding may still exist as a result of unmeasured variables correlated with physician income and practice acquisition. Fourth, our analysis focused on the relationship between vertical integration and physician income. Other forms of financial compensation, such as one-time buyout payments, equity arrangements, or nonfinancial compensation, were not addressed. In addition, we were unable to observe whether physicians held an ownership stake in the acquired practices. Hospital or health system purchases of physician practices likely lead to larger buyout payments for practice owners or partners.

Study Results

STUDY POPULATION

The study population comprised 41,648 physicians, of whom 20,105 (48.3 percent) were in independent practices and 21,543 (51.7 percent) were in hospital-acquired practices (appendix exhibit 3).²⁴ Compared with physicians in independent practices, physicians employed by a hospital or health system had lower annual Medicare billing (\$109,795 versus \$221,626; 95% confidence interval: 105,570, 118,093), were in practice for fewer years (22.7 years versus 24.8 years; 95% CI: 1.9, 2.3), were more likely to be female (23.0 percent versus 20.1 percent; 95% CI: 2.1, 3.7), and reported working more hours per week (59.4 hours versus 56.7 hours; 95% CI: 2.5, 3.0). Similar differences between physicians in independent versus hospital-acquired practices were observed by physician specialty (appendix exhibit 4).²⁴

VERTICAL INTEGRATION TRENDS

Hospital or health system ownership of physician practices in the study population increased from 2010 to 2018 (exhibit 1). In 2010, 24.1 percent of physicians in our data set worked in a practice that was owned by a hospital or health system compared with 45.6 percent in 2018, a relative increase of 89.2 percent. Among primary care physicians, 28.6 percent worked in a practice that was owned by a hospital or health system in 2010 compared with 47.7 percent of physicians by 2018, a relative increase of 66.8 percent. For nonsurgical specialists, 24.4 percent of physicians worked in a practice that was owned by a hospital or health system in 2010, increasing to 44.3 percent in 2018, a relative increase of 81.6 percent. The share of surgical specialists whose practices vertically integrated with a hospital or health system more than doubled, from 22.8 percent in 2010 to 45.9 percent in 2018.

VERTICAL INTEGRATION AND PHYSICIAN INCOME

Among physicians overall, vertical integration with a hospital or health system was associated with a small but statistically significant reduction in regression-adjusted physician income, with an absolute difference of $-\$2,987$ (95% CI: $-\$5,926$, $-\$49$) (exhibit 2) and

a relative difference of -0.8 percent (95% CI: -1.5, 0.01) (exhibit 3). The association varied by physician practice specialty. Among nonsurgical specialists, vertical integration was associated with a small, statistically significant reduction in physician income, with an absolute difference of -\$9,652 (95% CI: -14,141, -5,163) and a relative difference of -2.4 percent (95% CI: -3.6, -1.3). For primary care physicians, vertical integration was associated with a small but statistically insignificant increase in physician income with an absolute difference of \$3,179 (95% CI: -336, 6,695) and a relative difference of 1.2 percent (95% CI: -0.1, 2.5). Finally, among surgical specialists, vertical integration was associated with a small, statistically significant increase in physician income with an absolute difference of \$10,741 (95% CI: 1,850, 19,632) and a relative difference of 2.1 percent (95% CI: 0.4, 3.9).

The association between physician income and vertical integration with a hospital varied by hospital for-profit status. Relative to physicians in independent practices, physicians in practices that were vertically integrated with a nonprofit hospital had 1.9 percent lower annual income (95% CI: -3.8, -0.1), for an absolute adjusted difference of -\$7,381 (95% CI: -14,554, -209). No statistically significant differences in income were observed between physicians in independent practices compared with those in practices vertically integrated with a for-profit hospital. The relationship between vertical integration and physician income differed between for-profit and nonprofit hospitals in a formal test of interactions, with vertical integration with nonprofit hospitals associated with lower differences in compensation than integration with for-profit hospitals ($p = 0.02$).

The association between physician income and vertical integration with a hospital also varied by the degree of competition in the hospital market. When we used the market concentration definitions used by the Federal Trade Commission, physician income was not associated with vertical integration in highly concentrated markets (absolute income difference, -\$253 [95% CI: -3,586, 3,080]; relative difference, -0.1 percent [95% CI: -0.9, 0.8]). However, in non-highly concentrated (that is, competitive) hospital markets, vertical integration was associated with a 2.2 percent relative decrease in physician compensation (95% CI: -3.8, -0.6), for an absolute reduction of \$8,276 (95% CI: -14,307, -2,245). In a test of interactions, the difference in the association between the two hospital market structures was statistically significant ($p = 0.048$).

ADDITIONAL ANALYSES

In an event study analysis of the association between physician income and the time, in years, since a physician's practice was acquired by a hospital, we found no statistically significant difference in income between physicians whose incomes were surveyed in the two years before practice acquisition compared with physicians whose incomes were surveyed in the three years after acquisition (exhibit 4). Similar event study findings were observed when the three specialty categories were separately analyzed (appendix exhibit 14).²⁴ Although we did observe a statistically significant difference in income between physicians in vertically integrated and non-vertically integrated practices, overall, in the third year before practice acquisition (year -3), we did not find statistically significant

differences in physician income in other years or after vertical integration, suggesting that vertical integration was not associated with meaningful changes in physician compensation.

Our overall findings were also unchanged when we used propensity score methods to assess the relationship between physician income and vertical integration, when we applied sampling weights to make the survey population nationally representative, when we did not adjust for confounders, when we used linear regressions, and when we used the midpoint of compensation ranges (see appendix exhibits 8–13).²⁴

Discussion

The growing acquisition of physician practices by hospitals and health systems is one of the most important recent trends in how US health care is organized. Although these changes in organizational structure have been linked to increases in prices and spending that benefit hospitals and health systems,^{3,4,7,10,12,42} the extent to which these financial benefits of vertical integration also accrue to physicians in the form of greater income has not been examined. Combining national survey data on physician practice ownership with data on physician income, we examined whether hospital and health system ownership of physician practices was associated with differences in physician income during 2014–18. We found that ownership of physician practices was associated with slightly lower income for physicians overall, with some differences noted by specialty. In our main regression results, we found a –0.8 percent difference, which we interpret as a modest difference. There is heterogeneity around this estimate, but we do not interpret our multivariable or modified event study results as indicating large differences in physician income, particularly large increases, after employment by a hospital or a health system. Hospital or health system ownership of physician practices was associated with larger reductions in physician income in more competitive hospital markets and in nonprofit hospitals. These differences could reflect differential bargaining power between physicians and hospitals in less concentrated hospital markets and with for-profit hospitals. Despite the slight differences in results among physician specialties and across markets, there do not appear to be meaningful differences in income associated with acquisition of physician practices.

Our findings suggest that although vertical integration between hospitals and physician practices may be profitable to hospitals or health systems, physicians in practices that are acquired might not receive significant financial benefits in the form of higher income. Although some of the price increases associated with vertical integration could be passed on to vertically integrated providers, vertical integration also facilitates monopsony purchasing of physician labor, whereby concentrated employers face little competition for physician labor and thus depress compensation.²⁰ Although our study could not assess nonfinancial ways in which vertical integration with a hospital or health system may benefit providers, it appears that physicians might not capture much, if any, of the increases in system profits that occur after vertical integration. This study provides initial evidence that financial benefits of vertical integration of physicians with hospitals and health systems might not lead to direct financial benefits for physicians. The small reduction in physician compensation for nonsurgical specialists and small increase for surgeons is particularly notable given that

other studies have estimated an 19 percent increase in hospital revenue that occurs after vertical integration.¹⁴

This discrepancy raises the underlying question of why so many physician practices are vertically integrating with hospitals and health systems if physicians do not financially benefit in the form of greater income. One possibility is that physicians may receive alternative benefits from vertical integration. These benefits could include receiving compensation from a hospital or health system that is less variable than the income derived from owning a practice, which is a form of risk protection. Hospitals may also provide administrative services, such as billing and regulatory compliance services, that physicians would otherwise have to provide for themselves. For example, Medicare requires physicians to use EHRs or receive lower reimbursement.^{43,44} Having the hospital or health system handle implementation and maintenance of EHRs may be an incentive for physicians to join hospitals and health systems. Similarly, hospitals and health systems may more efficiently interact with insurance companies and other payers, leaving physicians with more time to practice medicine. The “lifestyle” benefits of more routine scheduling and less administrative burden may also serve as an indirect form of compensation for physicians.⁴⁵ However, other studies do not find evidence that new payment models introduced by the Affordable Care Act contributed to vertical integration.⁴⁶ At the extreme end, some hospitals may pressure physician groups to vertically integrate by limiting hospital admittance privileges.⁴⁷ To address these possibilities, future research should examine the impacts of vertical integration on physicians’ use of EHRs, time spent on administrative tasks, and practice flexibility.

Conclusion

The landscape of physician practices is rapidly evolving away from independent practices toward large multispecialty practices and employment by hospitals and health systems. This study finds that this shift might not be unambiguously beneficial to physicians. Understanding the reasons for and consequences of changes in physician employment is important for both physicians and the broader US health system. ■

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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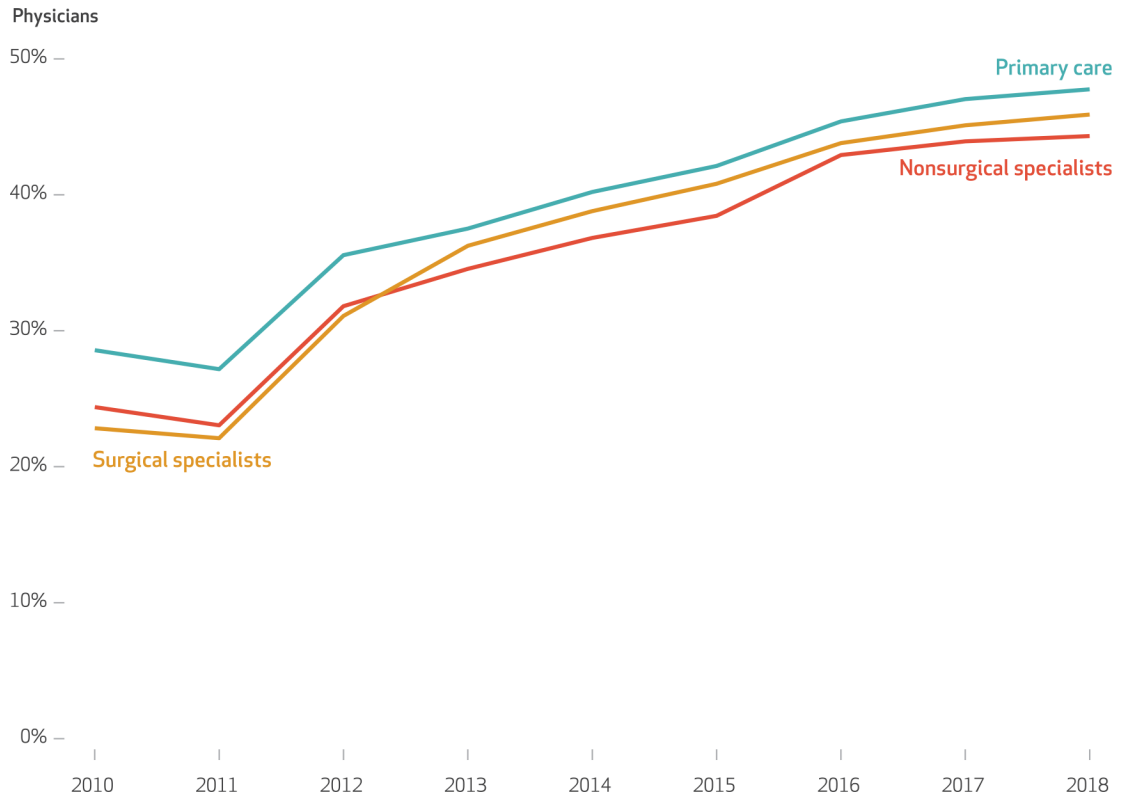


EXHIBIT 1. Percent of US physicians in practices owned by hospitals or health systems, by specialty group, 2010–18

SOURCE Authors’ analysis of data from SK&A Office-Based Physicians Database (now IQVIA). **NOTES** Specialist physicians included cardiologists, hematologists/oncologists, orthopedists, and radiologists. The percentage of physicians in practices owned by hospitals or health systems was calculated at the county level and then population weighted to create a national estimate for each year.

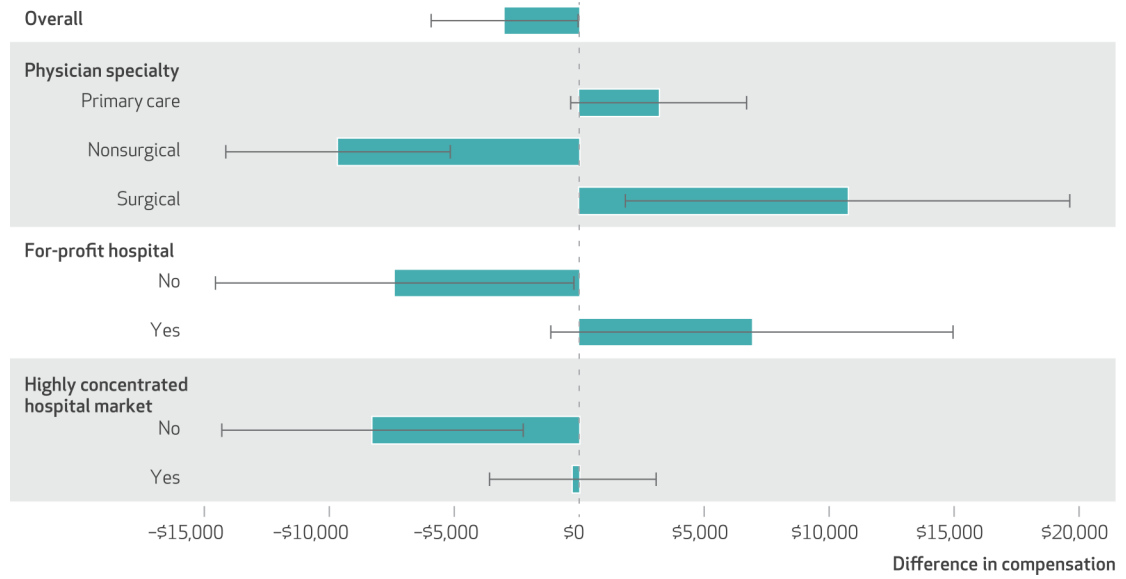


EXHIBIT 2. Association between hospital or health system ownership of US physician practices and dollar differences in physician compensation, by selected physician, hospital, and market characteristics

SOURCE Authors’ analysis of 2014–19 income survey data from Doximity and 2013–18 SK&A Office-Based Physicians Database (now IQVIA). **NOTES** Figure plots point estimates and 95% confidence intervals for the association between hospital or health system ownership of physician practices and dollar differences in physician compensation, and how this association varies by physician specialty, hospital profit status, and hospital market concentration. Regression results are in appendix exhibit 8 (see note 24 in text).

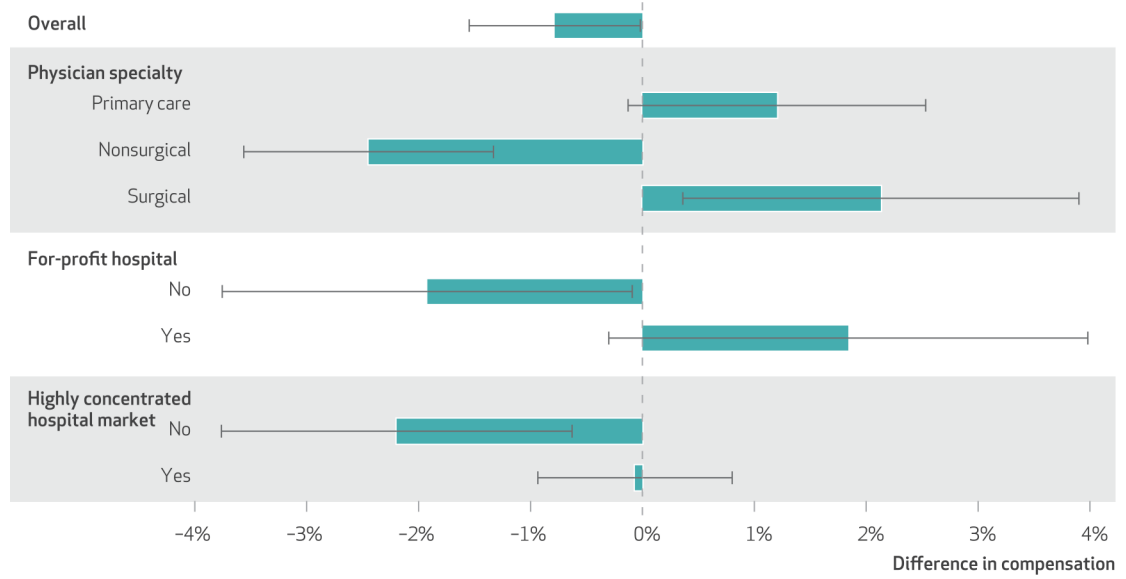


EXHIBIT 3. Association between hospital or health system ownership of US physician practices and percent differences in physician compensation, by selected physician, hospital, and market characteristics

SOURCE Authors’ analysis of 2014–19 income survey data from Doximity and 2013–18 SK&A Office-Based Physicians Database (now IQVIA). **NOTES** Figure plots point estimates and 95% confidence intervals for the association between hospital or health system ownership of physician practices and percentage differences in physician compensation, and how this association varies by physician specialty, hospital profit status, and hospital market concentration. Regression results are in appendix exhibit 9 (see note 24 in text).

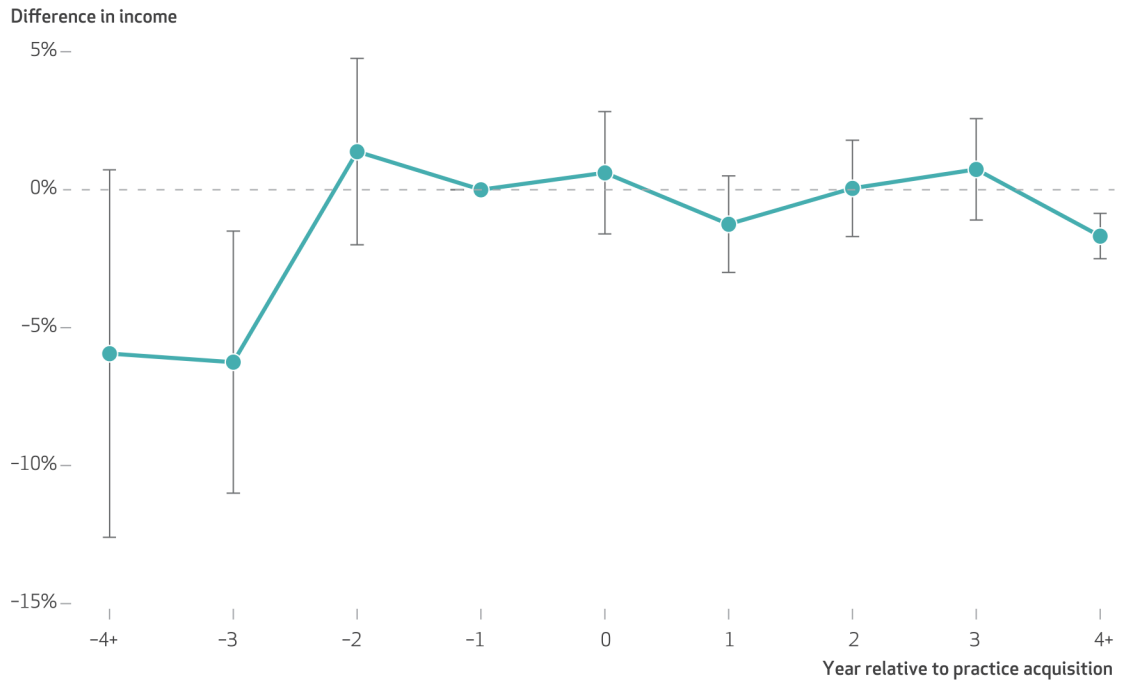


EXHIBIT 4. Association between US physician income and length of time relative to practice acquisition

SOURCE Authors' analysis of 2014–19 income survey data from Doximity and 2013–18 SK&A Office-Based Physicians Database (now IQVIA). **NOTES** Figure presents results from an event study analysis that compares incomes of physicians who happened to have their incomes surveyed before versus after their practice was acquired, under the assumption that the timing of when a physician was surveyed and reported their income was unrelated to the timing of that physician's practice being acquired. Regression results are in appendix exhibit 10 (see note 24 in text).