

Hospital Volume Responses to Medicare's Outpatient Prospective Payment System: Evidence from Florida¹

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Abstract: Effective in 2000, Medicare Outpatient Prospective Payment System (OPPS) sets pre-determined reimbursement rates for hospital outpatient services, replacing the prior cost-based methods of reimbursement. Using Florida outpatient discharge data, this paper examines the effect of OPPS on hospital outpatient service volume, particularly focusing on the potential supply substitution between Medicare and non-Medicare services when providers face a Medicare fee cut. Identification comes from the arguably exogenous OPPS-induced variation in payment rates both over time and across hospitals. Our results imply that, on average, the OPPS-induced rate reduction does not affect hospitals' outpatient volume paid by either Medicare or non-Medicare payers. However, hospitals with a high baseline share of Medicare patients (those with greatest exposure to the payment cuts) do increase outpatient volume among both Medicare and non-Medicare patients relative to hospitals with a low Medicare share. Taken as a whole, our results suggest that hospitals' responses to Medicare fee cuts are heterogeneous and that hospital outpatient departments do engage in demand inducement if the incentive to do so is strong enough.

Key Words: outpatient prospective payment system, Medicare payment reform, demand inducement, volume response, substitution.

JEL: I11, I12, H32, H51.

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1. Introduction

The Balanced Budget Act of 1997 established the Medicare Outpatient Prospective Payment System (OPPS), which went into effect on August 1, 2000. Prior to OPPS, Medicare reimbursed hospitals based on actual costs incurred in outpatient care delivery. Under OPPS, Medicare now classifies hospital outpatient services into approximately 800 ambulatory payment classifications (APCs) based on clinical and cost similarity. Regardless of the actual treatment cost, all services in the same APC are reimbursed at the same predetermined amount, with adjustments for local labor costs, certain hospitals, and outlier cases.

The use of prospective payment systems (PPS) in inpatient and several other health care delivery settings has been studied widely, but little is known about the impacts of OPPS on outpatient utilization.² This may reflect the complexity of the program; some have called the transition to OPPS “the most complex and difficult programmatic change in the history of Medicare” (Mohr and Kintala, 2003). Nonetheless, policies that affect hospital outpatient spending are of significant interest. From 2002 to 2007, Medicare outpatient spending per beneficiary grew 47% while inpatient spending grew only 18% (MedPAC, 2009a), and outpatient services currently constitute more than 20% of Medicare’s total payments to hospitals (MedPAC, 2010). Medical technological advancement is likely to further shift many conventional inpatient services to outpatient settings.

² See, for example, Cutler (1995) on Medicare PPS in inpatient acute care, Norton et al. (2002) on Medicaid PPS in inpatient psychiatric care, Sood et al. (2008) on Medicare PPS in inpatient rehabilitation care, White (2003) and Grabowski et al. (2010) on Medicare PPS in skilled nursing facility care, and McCall et al. (2003) on PPS in Medicare home health care. In general, many studies find evidence that hospitals respond to the financial incentives of PPS by reducing lengths of stay and other measures of resource use. See Salkeever (2000) and Chalkley and Malcomson (2000) for reviews of the effects of Medicare inpatient PPS on hospital costs, length of stay, and other measures of resources.

In this paper, we examine the effect of OPSS-induced payment changes on the volume of hospital outpatient services. In addition, we test for an important yet understudied aspect of provider response to Medicare payment reforms, the potential substitution between provision to Medicare patients and provision to non-Medicare patients, proposed in a theoretical model by McGuire and Pauly (1991) in the context of physician responses to Medicare fee cuts. Among the voluminous PPS studies, Scheffler et al (1994) is the only study, to the best of our knowledge, which systematically tests for the potential substitution between services reimbursed by Medicare and by non-Medicare payers, and does so in the context of inpatient PPS.

Using Florida outpatient discharge data from 1997 to 2008, we construct volume measures from counts of outpatient surgical procedures by payer for each hospital and year. To obtain the post-OPSS reimbursement rates, we follow guidelines on APC rate determinations published in quarterly issues of the Federal Register; for the pre-OPSS years, we develop algorithms to impute hospital-specific Medicare payment rates from discharge records and Medicare Cost Reports. Our imputed Medicare payment rates for the top ten most common surgical procedures show an average decrease of 22% in the five-year period before and after implementation of OPSS.

To test for the effects of OPSS-induced rate reductions on outpatient volume, we regress hospital- and procedure-specific utilization counts by payer on Medicare payment rates controlling for a wide range of hospital- and county-level explanatory variables. We also test for heterogeneous responses to OPSS, in particular, responses that vary by a hospital's exposure to OPSS, which we measure as the hospital's baseline Medicare share. Our results imply that OPSS-induced rate reductions, on average, do not affect hospitals' outpatient volume paid by either Medicare or non-Medicare payers. However, hospitals with a high baseline share of

Medicare patients do increase outpatient service provision to both Medicare and non-Medicare patients compared to low-share hospitals. Taken as a whole, our results suggest that hospitals' responses to Medicare fee cuts are heterogeneous; hospitals for which Medicare patients are not very important do not respond much to OPSS-induced payment cuts. In contrast, hospitals for which Medicare patients are important do engage in demand inducement, providing more services across payers likely to compensate for lost revenue from Medicare reimbursement rate cuts. These results are consistent with the types of physician responses to fee changes described in the McGuire and Pauly (1991) model.³

This paper proceeds as follows. Section 2 provides some background information on OPSS, and Section 3 describes a conceptual framework for examining OPSS's effects on volume paid by Medicare and non-Medicare payers. Sections 4 and 5 describe our data and empirical approach. We present regression results in Section 6. Finally, Section 7 concludes.

2. Background on the Outpatient Prospective Payment System (OPSS)

Prior to the implementation of OPSS in August 2000, Medicare used "a confusing mix" of different methodologies for the payment of hospital outpatient services (Wynn, 2005, pg. 5).⁴ Depending on the type of service, the reimbursement rate could be: (a) the lesser of costs or charges; (b) the lesser of costs, charges, or a blended rate; or (c) a fee schedule. In particular, payment for medical visits, therapy and rehabilitation services, and certain surgeries were based on hospitals' reasonable costs or customary charges. For clinical laboratory services, prosthetics and orthotics, and durable medical equipment, hospitals were paid according to fee schedules.

³ In future versions, we will test for heterogeneous responses by ownership status and by degree of vertical integration (between physicians and hospitals).

⁴ Note that OPSS and its precursor fee schedules pertain to the reimbursement of *hospital* costs; Medicare uses a separate fee schedule to reimbursement *physicians* who work in hospital outpatient settings.

ASC-approved surgical procedures and certain radiology and diagnostic procedures were reimbursed at the lesser of costs, charges, or a blended rate which combined the lesser of costs or charges with a fee schedule.⁵ To make things even more complicated, these methods were applied retrospectively on an aggregate basis only when Medicare determined the final settlement payment after hospitals submitted their annual cost reports (MedPAC, 1999).

Under this mostly cost-based reimbursement system, and in a period where technological changes shifted more care from inpatient to ambulatory settings, Medicare payment for hospital outpatient services rose sharply. Between 1983 and 1997, for example, MedPAC (1999) reports an annual rate of increase of 12%. Due in part to concerns that existing payment methods provided little incentive for hospitals to lower costs, the Balanced Budget Act (BBA) of 1997 and the Balanced Budget Reconciliation Act (BBRA) of 1999 established a prospective payment system for hospital outpatient services, the OPSS, effective on August 1, 2000.

As implemented in August 2000, OPSS essentially is a new fee schedule that works by grouping outpatient services, setting a predetermined payment rate for each group, and making necessary adjustments in certain circumstances.^{6,7} Multiple services are grouped into

⁵ An ASC is an Ambulatory Surgery Center. Medicare reimburses ASCs for performing only those surgeries on an “ASC-approved list.” In 1999, about 2,500 surgical procedures were on the ASC-approved list (MedPAC, 1999). Most of the surgical procedures we examine in this paper are ASC-approved.

⁶ OPSS applies to almost all hospitals participating in Medicare and to most hospital outpatient services. Some small groups of hospitals are not subject to OPSS; for example, hospitals in Maryland (which are paid under the state’s all-payer waiver provisions), Critical Access Hospitals, and Indian Health Services and Tribal hospitals are exempt (CMS 2010). Examples of excluded services are ambulance services, physical and occupational therapy, and speech-language pathology services (Federal Register, 2000, p. 18442).

⁷ Despite the similarities in their names, important differences exist between OPSS and prospective payment systems (PPS) used in other health care delivery settings such as inpatient acute care, inpatient rehabilitation, mental health, and home healthcare settings. One major difference is that these other PPSs reimburse for units of treatment such as hospital discharges or home healthcare episodes, involving substantial service bundling. For example, payments under the widely-studied Medicare inpatient PPS are based on the diagnosis-related group associated with the patient’s admission, and in most cases, the

Ambulatory Payment Classifications (APCs) according to their clinical and cost similarity (CMS, 2010). For example, as of October 2007, APC 141 includes 43 CPT codes for different forms of endoscopy of the esophagus and the upper gastrointestinal tract, and APC 143 includes 21 CPT codes, most pertaining to colonoscopy.⁸

To determine payment rates for each APC, the Centers for Medicare and Medicaid Services (CMS) first establishes a relative weight for each APC; this weight reflects the resource costs associated with services in the APC, and was initially based on the median cost of the services within each APC as determined by Medicare claims data and cost reports prior to 2000. The relative weight is then multiplied by a conversion factor to arrive at a national unadjusted payment rate for each APC. The labor portion (60%) of this national rate is adjusted for local wage differences using the hospital wage index. CMS annually revises APCs and relative weights in consultation with outside experts; in addition, CMS updates the conversion factor annually using the hospital market basket index (MedPAC, 2008). Hospitals also receive other adjustments for certain new technologies (called pass-through payments) and for unusually costly services (called outlier payments).⁹

From 2000 to 2003, OPSS allowed all hospitals to receive “transitional-corridor” payments, or supplemental payments for cases in which APC payment rates were less than rates in place under cost-based reimbursement (CMS, 2010). OPSS also aims to lower the

hospital is reimbursed a flat pre-determined amount for *all* services provided to the patient during the entire length of stay. In contrast, the unit of payment under OPSS typically is a particular service or procedure, and OPSS essentially just changed the reimbursement rate per service or procedure.

⁸ CMS frequently revises the APC system. Since implementation, the number of APCs has increased from 451 in 2000 to more than 800 in 2008.

⁹ As implemented under the BBA of 1997 and the BBRA of 1999, OPSS does not contain any bundled payment provisions. OPSS does include some packaging, or cases where payment for the primary service also includes reimbursement for ancillary or supportive services that are considered integral to the primary service. Ancillary services that are packaged include routine supplies, anesthesia, operating and recovery room use, inexpensive drugs, and some others (CMS, 2010).

coinsurance paid by Medicare beneficiaries for hospital outpatient services. Prior to 2000, Medicare beneficiary coinsurance for hospital outpatient services was set at 20 percent of the hospital charges. Because hospital charges usually greatly exceeded Medicare payment, coinsurance often amounted to much more than 20 percent of Medicare's payment amount. Under OPSS, coinsurance was to decrease each year until reaching a target of 20 percent of total payment amounts (MedPAC, 2008)

Several types of hospitals are treated differently under OPSS. First, small rural hospitals that achieve the specific designation of a Critical Access Hospital (CAH) are exempt from OPSS. Second, children's hospitals and cancer hospitals have permanent "hold-harmless status," meaning they receive the full difference between the OPSS amount and the pre-OPSS cost-based reimbursement. Third, small rural hospitals (with 100 beds or fewer) receive partial hold-harmless payments ranging from 85% and 95% of the full hold-harmless amount over the post-OPSS years. Fourth, sole community hospitals received full hold-harmless payments between 2000 and 2005, and beginning in 2006, these hospitals receive a 7.1% add-on to APC payments (MedPAC, 2008).¹⁰

3. Conceptual Framework

As the prior section illustrates, OPSS essentially works by changing (and presumably reducing) the Medicare payment rate to outpatient hospitals per service or procedure. According to economic theory, healthcare provider responses to rate or fee reductions can be complex. Standard profit maximization models would predict that competitive firms respond to price

¹⁰ For more information on OPSS, see Federal Register for the final OPSS release in 2000 and various updates and CMS website at www.cms.gov/HospitalOutpatientPPS (Accessed May 27, 2010). Another useful website is the APC Reference Library, available at www.irpsys.com/apceref.htm (Accessed May 27, 2010).

reductions by reducing quantity supplied. In contrast, models of utility maximization by physicians posit that price reductions may indeed increase volume when physicians can induce demand among their patients (McGuire and Pauly, 1991). To illustrate, when one payer exists, a price reduction brings about an income and a substitution effect. Under the income effect, physicians respond to income losses caused by fee cuts by inducing demand, or increasing volume. According to the substitution effect, a fee cut reduces the return to inducement, and the physician substitutes toward leisure, which decreases volume. If the income effect dominates the substitution effect, fee cuts then generate a downward-sloping physician supply curve.

McGuire and Pauly (1991) also model physician responses in the context of multiple payers (such as both a private insurer and Medicare). In this setting, a fee cut by one payer can affect the volume of services reimbursed by both payers, again working through income and substitution effects. For Medicare services, a Medicare fee cut will lead to the positive income and negative substitution effects described above, as well as a second substitution effect under which physicians substitute away from Medicare and toward services paid by the private insurers (which now have a relatively higher return). The net effect on Medicare volume is thus ambiguous; it depends on the relative sizes of the income and substitution effects. For services paid by the private payer, however, a Medicare fee cut would lead to an unambiguous increase in volume. This is because the positive income effect generated by the Medicare fee cut is reinforced by the second substitution effect (which leads physicians to substitute toward privately-insured services).

Several studies test the predictions of the McGuire and Pauly model. Many of these studies focus on physician fee cuts for so-called “overpriced” or “overvalued” procedures targeted by Congress in the Omnibus Budget Reconciliation Acts of 1987, 1988, and 1989.

Nguyen and Derrick (1997) find that volume responses varied by specialty and practice; “losing” practices that experienced the largest fee cuts responded with significant Medicare volume increases. Yip (1998) finds evidence that thoracic surgeons responded to a large fee reduction effect by increasing the volumes of both Medicare and private pay procedures. Rice et al. (1999) also find support for the McGuire-Pauly model: fee reductions increased the volume of services paid by private insurers across a large number of procedures.

Our study extends the McGuire and Pauly (1991) model to hospital outpatient departments.¹¹ This extension of physician responses to hospital outpatient departments is partly supported by evidence of increasing integration of hospitals and physicians in the supply of healthcare. In recent years there has been marked growth in the percent of hospital-owned medical practices and a coincident decline in the percent of physician-owned practices (Harris, 2010). In 2009, almost half of new physicians accepted positions in hospital-owned practices (MGMA, 2010). The growth in this type of vertical integration in healthcare may not only increase physician control over hospital resources but also may increase hospitals’ ability to engage in demand inducement.

We test several hypotheses related to McGuire and Pauly (1991). First, we test whether reductions in Medicare prices caused by OPSS increase the volume of services paid by non-Medicare payers, consistent with income and substitution effects that work in the same direction. Second, we test whether OPSS-induced fee cuts increase, decrease, or have no effect on Medicare volume. All three possibilities exist, and the outcome depends on the relative sizes of the income and substitution effects. Income effects could outweigh substitution effects, as

¹¹ To our knowledge, the only study of PPS in the outpatient setting is a working paper by Becker (2007). His study uses a pre- and post-OPSS design to examine changes in reimbursements and costs from 1999-2000; the sample includes only several months of post-OPSS data.

suggested by Nguyen and Derrick (1997) and Yip (1998), who both find increases in Medicare volume following the Medicare physician fee cuts. A relatively small income effect is also possible, though, if Medicare services constitute only a small share of hospitals' overall revenues, as is the case for outpatient services in most hospitals (AHA, 2010).

McGuire and Pauly (1991) suggest that the payers' market share is an important determinant of the income effect. Hospitals where Medicare patients constitute a larger share of total outpatient patients are likely to experience greater revenue threats from price cuts. In other words, such hospitals are more "exposed" to OPSS relative to hospitals with lower Medicare patient shares. We therefore test whether hospital-specific variation in the relative importance of Medicare services to the hospitals' total revenue causes the effects of price cuts to vary. In particular, we test for heterogeneous responses to OPSS by hospital exposure, namely that price cuts may lead to an increase in both Medicare and non-Medicare volume in those hospitals with larger shares of Medicare patients (where a larger income effect may dominate the substitution effect), relative to hospitals with lower Medicare patient shares.

4. Data

A. Hospital-Level Data on Medicare and non-Medicare Volume

Our main dataset is derived from Florida Ambulatory Discharge Data for years 1997 to 2008 obtained from the Florida Agency for Health Care Administration (AHCA). No existing national data would allow us to test the hypotheses we posit.¹² From several existing state-level

¹² For example, the widely-used Medicare claims data lack any information on services paid by non-Medicare payers. In fact, the Medicare outpatient claims are limited even if we had a narrow focus on Medicare volume alone. In the pre-OPSS years, the claims records have very limited information on the specific procedure codes, thus preventing construction of valid measures of counts and prices for specific outpatient surgeries (ResDAC, 2010). Survey data such as the National Hospital Ambulatory Medical

discharge databases, we select the Florida data for their high quality and the availability of multiple pre-OPPS years. As the 4th most populous state in the nation, Florida also has both a large number of hospitals and a large Medicare population, facts that mitigate some concerns about the generalizability of our study.

The unit of observation in the raw data is a patient discharge; each discharge record consists of up to 14 specific procedures performed, the total charge for the discharge, the principal payers, limited patient information (e.g., race, ethnicity, age, and sex), and the facility type and unique identification number. The facility type can be a hospital with an outpatient department, an Ambulatory Surgery Center, or a stand-alone cardiac catheterization or lithotripsy clinic. We focus on hospitals because OPPS applies only to hospital outpatient services. The data include almost all short-term acute care hospitals in Florida. There are about 200 such hospitals in each year, although the exact number varies slightly over time depending on reporting exemptions, entry/exit, and missing data.¹³ We use the raw discharge records to construct hospital- and procedure-specific counts of outpatient volume for each year and by payer (for Medicare, non-Medicare, and the combination of the two). For our purposes, “Medicare” is defined as fee-for-service Medicare, and “non-Medicare” consists of all other payers.

We focus on counts of outpatient *surgical* procedures given their large share of all hospital outpatient spending. These include procedures in the range of 10000-69999 in the Current Procedural Terminology, 4th edition. In 2007, 47% of all Medicare payment for hospital

Care Survey do not permit construction of a panel of hospitals because the survey assigns different hospital identifiers each year and the sample size is too small to aggregate to the hospital level.

¹³ Facilities performing fewer than 200 visits in a quarter are exempt from reporting. Also, a few hospitals are missing from the data for unknown reasons (personal communication with Florida AHCA staff members).

outpatient services was for surgical procedures, while 23% went toward imaging, 13% toward evaluation and management, and 11% toward blood and blood products (MedPAC, 2009b). Because of the large number of procedures in this group, we focus on the top ten most common surgical procedures performed in our sample hospitals' OP departments in 1999, the year prior to the implementation of OPSS. This list includes certain types of endoscopies, cataract surgeries, and colonoscopies, among other procedures (see Table 1C).

Table 1A reports the summary statistics of the utilization measures; for ease of presentation, data from 1999 are presented. On average, 182 Florida hospital outpatient departments performed 7,629 outpatient surgical procedures in 1999. Roughly one-third were paid by traditional (fee-for-service) Medicare. The remaining rows include counts for the ten most common CPT codes in that year; together these represent about one-third of all surgical procedures performed in hospital OP departments. Note that hospital counts vary based on our ability to calculate payment rates from the discharge data (see below).

B. Payment Rate Data

Because we focus on specific procedures and because hospitals were reimbursed different amounts for each procedure, we need to obtain the Medicare reimbursement rate for each hospital, procedure of interest, and year. For the post-OPSS years, we obtain quarterly CMS publications reporting payments for each ambulatory payment classification (APC) along with quarterly crosswalks from CPT to APC.¹⁴ We apply APC adjustments such as hospital wage indices and other hospital traits to construct a dataset of the APC-based payment rate for each of the top ten CPT procedures, by hospital, and for each post-OPSS quarter and then average the quarterly data to create annual data.

¹⁴ These are available at www.cms.gov/PCPricer/OutPPS and www.irp.com/apc/apc_ref.html.

Obtaining hospital- and procedure-specific payments in the pre-OPPS years is a key challenge in using discharge data, a challenge to which we propose an innovative solution.¹⁵ Because discharge records report total *charges*, we convert each charge to a payment using an outpatient surgery payment-to-charge ratio imputed from each hospital's annual Medicare Cost Reports. Before this conversion, however, *CPT-specific charges* must be defined because discharge records report only the *total* charge associated with all procedures on the record.¹⁶ We thus develop an algorithm to impute those hospital- and procedure-specific charges for each hospital and for each of our top ten CPT codes in the pre-OPPS years. The algorithm, for a given hospital and a given procedure of interest, works as follows:

Step 1: We search among the hospital's single-procedure discharge records (those records with only one CPT procedure code) for the CPT procedure of interest. If such a single-procedure discharge exists, the associated *total charge* on this record identifies the *CPT-specific* charge. If multiple discharges of this type exist for the hospital, we take the median of those charges to avoid the influence of outliers. If Step 1 fails to produce a match, then we proceed to Step 2.

Step 2: We search for two-procedure discharges which contain the CPT of interest and another procedure that we call the "companion" CPT. If we cannot find this type of record, we stop. If such records do exist, then we look for single-procedure discharges containing only the companion CPT. If these exist, we calculate the charge for the CPT of interest as the difference between the charge for the two-procedure discharge and that for the single-procedure discharge with the companion CPT. If this does not result in a match (i.e., no single-procedure discharge contains the companion CPT), the algorithm goes to Step 3.

Step 3: We search for two-procedure discharges that contain the companion CPT and some other CPT (the "companion of the companion"). If such records exist, we can calculate the companion CPT's charge as in Step 2. Once we obtain the companion CPT's charge, we can similarly calculate the charge for the CPT of interest.

¹⁵ Due to the complex Medicare reimbursement scheme for hospital outpatient services, "...it was difficult, if not impossible, to know the amount Medicare paid for a given outpatient service; even if this amount could have been determined, it could only have been known once the cost reporting process was complete, long after the service was provided" (MedPAC, 1999, pg.130).

¹⁶ Recall that in our data, each discharge record can contain as many as fourteen procedures.

Step 4: Implement Steps 1-3 for all three pre-OPPS years. If Steps 1-3 fail to produce a CPT-specific charge for the hospital for all three years, stop: we have no matches for this hospital and CPT procedure. If Steps 1-3 produce the needed charges for all three years, stop: we have successfully matched that hospital and CPT procedure to a charge. Otherwise (i.e., the CPT-specific charge is identified for at least one year, but not all three years), go to Step 5.

Step 5: Apply the medical CPI to the charge for the available year or years to impute the charge for the missing year or years.

Using this algorithm, we are able to identify CPT-specific charges for 79-96% of hospitals in our sample.¹⁷ Once we obtain these procedure- and hospital- specific charges, we apply hospital-specific outpatient surgery payment-to-charge ratios imputed from annual Medicare cost reports from 1997 to 1999. Unlike ratios such as the provider's *overall* cost-to-charge ratio (which is widely used in the PPS literature to impute provider-specific pre-PPS payment rate), the payment-to-charge ratio we use is specific to outpatient surgeries. This feature helps reduce the measurement error in our imputed payment rates, relative to the existing literature.

Figure 1 illustrates the average Medicare payment rate (in constant 2008 dollars) over time for each of the top ten procedures. The majority of procedures experienced a decrease in their Medicare payment rate after the implementation of OPSS. Indeed, reimbursement rates decreased for all but one procedure between 1999 and 2004, the first year when OPSS was in full effect, with reductions ranging from 7 to 84% and averaging 22% (see Table 1C). For most procedures, there is a drop in the average payment rate between 1997 and 1998, something we return to in our robustness checks.

C. Other Explanatory Variables

¹⁷ Currently we are further developing the algorithm to improve the match rate.

As discussed earlier, OPSS also affects Medicare beneficiaries' coinsurance amounts. We obtain coinsurance data from two sources. For the post-OPSS years, we calculate coinsurance amounts from CMS quarterly releases of the OPSS PPS pricer documentation.¹⁸ Because coinsurance was set at 20% of charges during the pre-OPSS years (MedPAC, 1999), we apply this percentage to our hospital- and procedure-specific charges in 1997 through 1999.

We also control for private reimbursement rates for each procedure and year at the level of 3-digit zipcode in which the hospital is located. Given that private payers may follow Medicare's suit and change their reimbursement scheme, it is important to control for the private pay rates. These data were purchased from the MedStat MarketScan databases available from Thomson-Reuters. The finest level of geography available is the 3-digit zipcode level. We also include various county- and hospital-level control variables in our analysis. We compile county-level data for each year from 1997-2008 from various sources. We obtain county-level estimates of the total population, the population age 65 and up, the female population and the Hispanic population from the U.S. Census. Because Census reports population estimates by racial subgroup differently before 2000 and from 2000 on, we obtain estimates of the black population from Florida Charts reports released by the Florida Legislature's Office of Economic and Demographic Research. We obtain estimates of median household income from the March Current Population Survey (CPS) from the Census, and we obtain estimates of county unemployment rates from the BLS Local Area Unemployment reports.¹⁹ We obtain Medicare

¹⁸ See www.cms.gov/PCPricer/OutPPS, accessed October 20, 2010.

¹⁹ Population estimates from the U.S. Census Bureau for years 1997 to 1999 were obtained from <http://www.census.gov/popest/datasets.html#cntyinter>. Population data for 2000 to 2008 are from www.census.gov/popest/counties/CO-EST2008-01.html. For all years except 2000, data are estimates as of July 1. Unemployment rates were obtained from annual average labor force data by county, available at www.bls.gov/lau/. Florida population estimates of racial subgroups were obtained from www.floridacharts.com/charts. Median household income data are obtained from the Census Bureau website available at www.census.gov/did/www/saipe/data/statecounty/data/.

managed care penetration rates from CMS for years in which they were available (1997-2005 and 2008). County-level data on the number of patient-care MDs not employed by the federal government is obtained from the Area Resource File (ARF), where it is available for all years except 2008. We obtain potentially time-varying hospital-level controls such as ownership status, teaching status, bed size, statutory rural hospital status, and critical access hospital status from Florida's January issues of the *Hospital Beds and Services List* for years 1998 to 2009. We apply January data from each year to the prior year.

Table 1B reports the means of all hospital- and county-specific variables also for 1999. Only 3.4% of hospitals are teaching hospitals. Forty-five percent of hospitals are non-for-profit, about the same percentage are for-profit, and 11% are public. The average bed count is 237. On average, county populations are 14% Black, 7.2% Hispanic, 50% female, and 18% aged 65 and older.

5. Empirical Strategy:

To examine how hospital outpatient volume responds to the OPSS-induced payment change over time and across hospitals, we estimate the following model:

$$(1) \quad \log(Surg_Count_{ht}) = \beta_0 + \beta_1 \log(Payment_{ht}) + \beta_2 \log(coins_{ht}) + \beta_3 \log(private_price) + \lambda_t + \alpha_h + Z_{ct} \Pi + X_{ht} \Gamma + \varepsilon_{ht}$$

The dependent variable is the log of payer-specific OP surgery counts for a given procedure at hospital h 's outpatient department in time period t , where t ranges from 1997 to 2008. Because OPSS was implemented August 1, 2000, we exclude 2000 data from all of the regression analysis. We estimate three variations of this model, where the dependent variable is defined 1) for overall utilization (Medicare and non-Medicare combined), 2) for Medicare utilization only,

and 3) for non-Medicare utilization only. We separately estimate Equation (1) for the top ten most common surgical CPTs, allowing for differential responses across CPT procedures.

$Payment_{ht}$ is the (imputed) Medicare reimbursement rate for a given procedure in hospital h at time period t . To address the fact that OPSS also reduced coinsurance amounts for hospital outpatient services, a factor that may alter volume, we also control for $\log(Coins_{ht})$, the log of coinsurance amount associated with each procedure in each hospital and year.²⁰ $Private_price_{ht}$ is the procedure's median private reimbursement rate in time t in the 3-digit zipcode where hospital h is located.²¹ Z_{ct} is a set of county-year-level controls (such as population size, income and demographics) and X_{ht} is a set of hospital-year-level controls (namely bed size, ownership status and teaching status). We also control for year- and hospital- fixed effects (λ_t and α_h). The coefficient of interest in Eq. (1) is β_1 , which can be interpreted as a supply elasticity to price changes, representing the hospitals' volume response to payment reimbursement rate changes.

To test for heterogeneous responses to the rate cuts induced by OPSS, we next estimate Model (2) below:

$$(2) \quad \log(Surg_Count_{ht}) = \alpha_0 + \alpha_1 \log(Payment_{ht}) * MedShare_h + \alpha_2 \log(Payment_{ht}) + \alpha_3 * \log(Coins)_{ht} + \alpha_4 \log(private_price_{ht}) + \lambda_t + \alpha_h + Z_{ct} \Pi + X_{ht} \Gamma + \varepsilon_{ht}$$

In this model, $MedShare_h$ represents for each hospital h the share of the total number of outpatient surgeries in which Medicare fee-for-service (FFS) was the primary payer, measured in the last year prior to OPSS (1999) and defined separately for each of the top ten procedures. It is a measure of how important Medicare patients are to the hospital. As discussed earlier, a high share hospital should experience a stronger income effect in McGuire and Pauly's model because

²⁰ Using the log or level of the dollar amount or the coinsurance rate does not affect our estimation results. That said, because most Medicare beneficiaries have Medigap coverage, they likely are insulated from coinsurance amount change (the authors thank David Becker for this insight).

²¹ The results are almost identical when we use the mean price. Indeed, the results change little whether we control for the private pay prices or not.

it is “more exposed” to OPSS, thus may have a stronger volume increase when experiencing price cuts. This hypothesis would be supported by a negative β_2 estimate.

6. Results

A. Average Payment Effects

To examine the effects of OPSS on volume, we first estimate Equation (1) for counts of the ten surgical procedures paid by both Medicare and non-Medicare combined, Medicare only, and non-Medicare only. In these regressions (and in regressions of Equation (2) which follow), we exclude all CAHs and cancer and children’s hospitals from the sample because these hospitals were either exempt from OPSS or receive full hold harmless payments in the post-OPSS period. We also we exclude data from 2001 to 2003, the transitional corridor period during which hospitals received a portion of the difference between the OPSS payment amount and the amount that would have been paid under the old cost-based payment scheme, and thus were not fully subject to OPSS. All county-level controls shown in Table 1B are included, except for the number of patient-care non-federal MDs and Medicare HMO penetration rate. The former variable is missing for 2008 and the latter is missing for both 2006 and 2007, so including these variables would greatly reduce our post-OPSS observation period.²² The main regression results control for time-varying hospital traits including ownership status (public, for-profit hospitals, non-for-profit hospitals), teaching status, and acute beds.²³ Finally, we include year and hospital fixed effects in all regressions.

²² We will examine the sensitivity of including these two controls in the robustness check session.

²³ In another robustness check, we exclude the hospital-level controls because those controls are potentially endogenous, i.e., they may reflect hospitals’ responses to OPSS.

Regression results for Equation (1) are reported in Tables 2A, 2B, and 2C for overall utilization, Medicare utilization only, and non-Medicare utilization only. Each table has ten columns, corresponding to the top ten procedures of interest. The first row in each table reports the estimated coefficient on payment. Given the log-log specification, this coefficient can be interpreted as a price elasticity of volume. For each estimate we report three standard errors: the unclustered standard errors in parentheses followed by robust standard errors clustered by county (first row of brackets) and by hospital (second row of brackets). Regardless of the way standard errors are calculated, however, the coefficient estimates in these tables are seldom significant. Thus Table 2 results suggest that, on average, OPSS had little effect on either Medicare or non-Medicare surgical procedure volume.

B. Heterogeneous Payment Effects

Tables 3A, 3B, and 3C report regressions results from the estimation of Equation (2) for overall utilization, Medicare utilization, and non-Medicare utilization, respectively. By including an interaction term between the payment rate and the Medicare share variable, these regressions test for hospitals' heterogeneous responses to the OPSS-induced payment cuts. The first row of these tables reports the coefficient of the interaction term; again ten columns are included in each table for the top ten most common procedures. We again report unclustered standard errors (in parentheses) and clustered standard errors by county and by hospitals (in brackets);

The Medicare utilization results in Table 3B show that, in all but one case, negative coefficient estimates of the payment-share interaction term; in the majority of cases they are also statistically significant. Note that this pattern is surprisingly consistent given the small numbers of cross-sectional observations (generally less than 175 hospitals) and given that the pre-OPSS

payment amounts are likely to be subject to considerable measurement error. In several cases the magnitude of the coefficients is quite large, exceeding one in absolute value. We see a similar pattern in Table 3C for the non-Medicare utilization measures. Of the ten different estimates of the interaction term effect, here seven are negative, and six of these are statistically significant. All of the positive coefficient estimates are insignificant. Thus, for both Medicare and non-Medicare volume of most of these outpatient surgical procedures, Tables 3B and 3C suggest that an OPPS-induced price *cut* led to an *increase* in volume in hospitals with larger Medicare shares, relative to hospitals with lower Medicare shares. This is consistent with the higher share hospitals experiencing larger income effects in response to price reductions.

C. Robustness Checks

One concern in the main regressions regards the quality of the private reimbursement rate data provided by Marketscan. Specifically, in the early years of our time period, Marketscan did not have heavy coverage in Florida. Instead of controlling for the 3-digit zipcode level private pay price provided by Marketscan, we therefore control for 3-digit zipcode-specific year effects. This set of zipcode-year dummy variables absorbs any factors which vary over time at the 3-digit zipcode level, including private pay price and beyond (e.g., services furnished in freestanding ambulatory service centers and in physicians' offices). Table 4 shows the results, which are similar to the main results in Table 3.

We next test the sensitivity of our heterogeneous response results with a number of robustness tests. In our first robustness check, we add county-level time-varying controls for the number of patient-care, non-federal MDs and Medicare HMO penetration rate, variables that were omitted from the main analysis because of missing data in several years. Results, shown in Table 5, are qualitatively similar. In a third robustness check, we exclude the three hospital-level

controls (bed size, ownership status, and teaching status) which potentially could be endogenous. These results are shown in Table 6, and again, are qualitatively similar to our main results.

A fourth robustness check excludes all the small rural hospitals and the sole community hospitals we have identified in our dataset. CMS rules continued to shield those hospitals from OPPS even after the expiration of the transitional corridor period, as we described in the Background section. The results are reported in Table 7. Again, our results are robust to this exclusion.

Table 8 reports the results from a fifth robustness check, in which we include data from 2001-2003, the transitional period. As expected, the coefficients estimates are generally smaller than those obtained in the main regressions, although we continue to see a similar pattern in which hospitals with higher Medicare shares increased both Medicare and non-Medicare provision relative to less-exposed hospitals as payment rates fell.

In Table 9, we conduct another robustness check by excluding all control variables other than the year indicator variables. This test is to check whether our results are sensitive to time varying county-level and hospital-level controls. If so, we would be more concerned with unobservable factors driving the observed patterns. If not, then we could be more confident that the interaction of the Medicare share with the payment variable is exogenous. Table 9 shows qualitatively similar results to our main results in Table 3, supporting the exogeneity of our main variable of interest.

In Table 10, we test the sensitivity of our results to excluding one year of the pre-OPPS period, 1997. This test is motivated by the noticeable drop in payment rates between 1997 and

1998 reported in Figure 1. We suspect that this drop is due to a change in CMS Medicare cost reporting policies.²⁴ Our main results are again robust to this check.

Finally, we perform a falsification test to investigate the potential endogeneity of the Medicare share-payment interaction term. In particular, the size of the payment rate change induced by OPSS differed across hospitals, depending on hospitals' pre-OPSS cost-based reimbursement levels. One therefore may suspect endogeneity in the Medicare share-payment interaction term. For example, a hospital has high cost-based payment rates pre-OPSS (maybe because the health care local market is not very competitive thus the hospital does not have incentive to reduce costs), thus it would face a large payment reduction when OPSS is in full effect. Suppose that the hospital also happens to treat a large share of Medicare patients in the baseline year. Such a hospital would have a high value of the payment-share interaction. If over time, the lack of competition in the local market enables this hospital to gain more Medicare and non-Medicare patients, then even in the absence of OPSS, this hospital would experience increases in both types of volume. This would cause a spurious negative correlation between our share-payment interaction term and the dependent variables, thus biasing our coefficient estimates.

To test whether such a trend exists in the pre-OPSS period, we conduct the following falsification test. We assign the 2004 OPSS price (recall OPSS went into full effect in 2004) to 1999 and thus create a "fake share-payment interaction" for 1999. We then define the baseline share variable using 1998 data. Then we use only data from the three pre-OPSS years (1997-1999) to estimate Equations (2), treating 1997 and 1998 as pre-OPSS and 1999 as the fake post-

²⁴ In both 1998 and 1999, the imputed payment-to-charge ratio is 25% while in 1997, that ratio is 30%. The CMS Cost Report Instruction Manual shows that in 1997, CMS changed the way coinsurance and deductibles were handled in the cost reports, so hospitals, depending on when they submit the cost reports during a fiscal year of 1997, could be subject to either the new or the old rules. This adds more noise in the imputed 1997 payment-to-charge ratio.

OPPS year. If there had been a pre-existing trend in Medicare and non-Medicare volume in hospitals with high share-payment interaction, our fake share-payment interaction coefficient would pick up this trend. If the coefficient estimates do not show a trend, we can be less concerned with the potential endogeneity caused by pre-trending.

Table 11 shows the results from this falsification test. Compared to results on Medicare and non-Medicare counts reported in Tables 3B and 3C, the results in Table 11 are somewhat supportive for the exogeneity of the Medicare share-payment interaction term. In most cases the coefficients of the interaction term shown in Table 11 are not statistically significant. Of the twenty payer-specific regressions, the interaction term is negative and significant in only four cases. In most cases, too, the coefficients are much smaller in magnitude than their Table 3 counterparts; nonetheless, the existence of those negative coefficient estimates in Table 11 suggests that endogeneity concerns deserve additional attention.

7. Discussion and Conclusions

Our results suggest that, on average, OPPS-induced payment cuts had no significant effect on hospital outpatient surgical procedure volume among either Medicare or non-Medicare patients. However, once we account for heterogeneous responses based on a hospital's exposure to the policy (measured by Medicare share at baseline), we find that highly-exposed hospitals responded to payment cuts by increasing both Medicare volume and non-Medicare volume for most commonly-used surgical procedures, relative to the less-exposed hospitals. These results are consistent with highly-exposed hospitals experiencing larger income effects in light of payment cuts. They suggest that some hospital outpatient departments are responsive to

Medicare reimbursement for at least certain procedures, engaging in both demand inducement among Medicare patients and substitution of services to non-Medicare patients.

In terms of the effectiveness of OPSS, our results suggest that OPSS's ability to control costs may have been impaired by the responses of some hospitals. Although, on average, we find that volume was unchanged by OPSS, it is conceivable that in the absence of the responses of heavily exposed hospitals, volume paid by the Medicare program may have fallen, as would be predicted by standard profit maximization in response to price cuts (upward sloping supply curve).

More broadly, this study provides interesting evidence that non-physician providers such as hospital outpatient departments may also engage in demand inducement, a finding that further highlights the serious challenge of containing healthcare costs under fee-for-service payment arrangements. Hospital cost control issue may take greater importance over time in light of the recent trend of increasing vertical integration between physicians and hospitals. This type of integration may further increase the ability of hospitals to induce demand.

In the last fifteen years, Congress and the CMS have implemented a number of new prospective payment systems. These include, for example, PPS in skilled nursing facilities or SNFs (effective 1998), in inpatient psychiatric hospitals (effective 2002), in long-term care hospitals (effective 2002), and in inpatient rehabilitation hospitals (effective 2002). Our results also suggest that an important area for future research is to examine the potential heterogeneous responses based on providers' exposure to the Medicare program in these other PPS settings.

Finally, our results provide additional support for the movement away from fee-for-service (FFS) style reimbursement schemes and toward alternative forms of provider payment, particularly with regard to cost containment. The Affordable Care Act of 2010 includes

provisions for a number of FFS-alternatives, such as the use of bundled payments, medical homes, and accountable care organizations. While additional research on the appropriate structures and the effectiveness of these alternative compensation schemes is needed, all of these essentially depart from FFS payment in a way that OPSS does not. Our results suggest that Medicare payment reforms that retain a FFS approach are unlikely to be effective in containing Medicare costs, because such reforms could create the incentive for certain hospitals to induce demand among Medicare patients. Even more worrisome, reductions in fee-for-service payments may even create incentives for hospitals to induce demand among non-Medicare patients. By thus affecting private payers as well, Medicare FFS-type payment reforms are further limited in their ability to reduce societal costs.

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Table 1A. Summary Statistics for Dependent Variables (based on 1999 data)

	Variable Name	Mean	SD	N
Overall	count	7629	6062	182
	Medicare count	2390	2051	182
	Non-Medicare count	5240	4768	182
Top 10 CPT codes				
1	count	508	448	173
	Medicare count	174	182	173
	Non-Medicare count	335	317	173
	Medicare share	0.358	0.168	173
2	count	473	420	175
	Medicare count	170	173	175
	Non-Medicare count	303	297	175
	Medicare share	0.382	0.166	175
3	Count	343	477	143
	Medicare count	204	316	143
	Non-Medicare count	138	210	143
	Medicare share	0.575	0.275	143
4	Count	250	497	173
	Medicare count	86	171	173
	Non-Medicare count	164	336	173
	Medicare share	0.348	0.180	173
5	Count	262	590	164
	Medicare count	150	354	164
	Non-Medicare count	112	256	164
	Medicare share	0.386	0.242	164
6	Count	224	291	160
	Medicare count	115	170	160
	Non-Medicare count	109	157	160
	Medicare share	0.505	0.230	160
7	Count	212	257	167
	Medicare count	85	116	167
	Non-Medicare count	127	162	167
	Medicare share	0.415	0.195	167
8	Count	204	190	173
	Medicare count	83	98	173
	Non-Medicare count	121	119	173
	Medicare share	0.411	0.187	173
9	Count	109	114	166
	Medicare count	23	30	166
	Non-Medicare count	86	97	166
	Medicare share	0.231	0.157	166
10	Count	100	92	172
	Medicare count	26	30	172
	Non-Medicare count	74	77	172
	Medicare share	0.293	0.196	172

Table 1B. Summary Statistics for Hospital- and County-Level Control Variables

	Mean	SD	N
Hospital-Level Controls			
Ownership: Non-for-profit	0.45	0.50	182
For-profit	0.45	0.50	182
Public	0.11	0.31	182
Teaching	0.034	0.18	182
Acute Care Beds	237	167	182
County-level Controls			
Total Population	225541	377381	67
Proportion Black	0.14	0.10	67
Proportion Hispanic	0.072	0.087	67
Proportion Female	0.50	0.032	67
Proportion Age 65 & up	0.18	0.071	67
Median HH Income	33561	5837	67
Unemployment Rate	4.7	2.4	67
Percent Poverty	14	3.9	67
Patient care MDs	490	1007	67
Medicare Managed Care Penetration Rate	13	15	67

Table 1C. Average Medicare Payment Rates for the Top 10 CPT Codes in 1999 and 2004

Code	Index	1999	2004	Diff(%)	Short Description
43239	1	537	458	-15%	Upper GI endoscopy, biopsy
45378	2	480	486	1%	Diagnostic colonoscopy
66984	3	1451	1347	-7%	extracapsular cataract Removal
45380	4	574	486	-15%	Colonoscopy and biopsy
11042	5	931	151	-84%	Debride skin/tissue
36430	6	395	215	-46%	Blood transfusion service
45384	7	590	486	-18%	Lesion remove colonoscopy
45385	8	597	486	-19%	Lesion removal
19120	9	1092	1035	-5%	Removal of breast lesion
49505	10	1653	1580	-4%	Repair inguinal hernia

Table 2A. Main Regression Results for Overall Utilization Levels: Payment-level Regressions (Average Effect)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Log of Combined Counts (Medicare +non-Medicare)										
lpayment	-0.27	-0.27	-0.14	-0.10	0.46*	0.21	-0.19	-0.21	0.08	0.20
	(0.20)	(0.18)	(0.30)	(0.18)	(0.26)	(0.28)	(0.22)	(0.20)	(0.13)	(0.13)
	[0.20]	[0.19]	[0.69]	[0.22]	[0.54]	[0.42]	[0.30]	[0.24]	[0.23]	[0.20]
	[0.25]	[0.24]	[0.68]	[0.24]	[0.47]	[0.39]	[0.33]	[0.32]	[0.21]	[0.22]
lcoinsur	0.18	-0.21	0.36	0.06	-0.79***	-0.23	0.13	0.23	-0.05	-0.04
	(0.20)	(0.18)	(0.29)	(0.18)	(0.26)	(0.29)	(0.22)	(0.20)	(0.13)	(0.12)
lpay_prvt	-0.05	-0.69***	-0.08	-0.18	0.15**	-0.12*	0.04	0.16	0.04	-0.03
	(0.13)	(0.19)	(0.21)	(0.15)	(0.07)	(0.06)	(0.13)	(0.16)	(0.08)	(0.06)
totpop	0.00	0.00	0.00**	0.00*	0.00	-0.00***	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
prop_black	-0.01	-0.08*	0.01	-0.03	-0.05	0.33***	-0.07	-0.12**	-0.02	-0.04
	(0.05)	(0.05)	(0.08)	(0.05)	(0.07)	(0.07)	(0.06)	(0.05)	(0.04)	(0.03)
prop_hisp	-0.00	-0.01	-0.06	-0.02	-0.01	0.05	0.05	0.02	0.00	-0.02
	(0.03)	(0.03)	(0.06)	(0.03)	(0.05)	(0.05)	(0.04)	(0.04)	(0.02)	(0.02)
prop_female	-0.06	-0.19	-0.13	-0.41***	-0.37*	-0.19	-0.18	-0.20	0.18*	0.22**
	(0.15)	(0.14)	(0.22)	(0.14)	(0.20)	(0.23)	(0.18)	(0.16)	(0.10)	(0.10)
prop_age65	0.16***	0.15***	0.23***	0.17***	-0.12***	0.15***	0.19***	0.19***	0.08***	0.06***
	(0.03)	(0.03)	(0.05)	(0.03)	(0.04)	(0.05)	(0.04)	(0.03)	(0.02)	(0.02)
unemprate	-0.17	-0.19	0.39*	-0.10	-0.60***	0.13	0.05	-0.19	0.00	-0.03
	(0.15)	(0.13)	(0.23)	(0.14)	(0.19)	(0.21)	(0.16)	(0.15)	(0.10)	(0.09)
unemprate2	0.02*	0.02**	-0.03	0.02	0.04**	-0.00	0.00	0.02*	0.00	0.00
	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
medhhinc	-0.00	-0.00	-0.00	-0.00	-0.00***	0.00**	0.00	-0.00	-0.00*	-0.00**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
medhhinc2	0.00	0.00	0.00	0.00	0.00***	-0.00	-0.00	0.00	0.00*	0.00***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ownership	0.04	0.08	-0.21	-0.12	0.38**	0.37**	0.05	0.01	-0.03	0.01
	(0.13)	(0.12)	(0.18)	(0.12)	(0.17)	(0.18)	(0.14)	(0.13)	(0.08)	(0.07)
teaching	0.58**	-0.09	0.80*	0.43	-1.05***	0.27	0.05	0.28	-0.34*	-0.24
	(0.29)	(0.27)	(0.47)	(0.27)	(0.39)	(0.41)	(0.33)	(0.30)	(0.20)	(0.19)
acutebeds	0.00*	0.00***	-0.00	0.00**	-0.00	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
# of obs	1431	1439	1348	1433	1402	1384	1413	1432	1419	1433
R2	0.056	0.113	0.243	0.061	0.146	0.049	0.060	0.076	0.266	0.069
# of hospitals	202	204	199	204	202	201	201	203	203	203

Notes: parentheses: Standard errors; first row of brackets: Robust standard errors clustered at the county level; second row of bracket: Robust standard errors clustered at the hospital level; *** p<0.01, ** p<0.05, * p<0.1

Table 2B. Main Regression Results for Medicare Utilization Levels: Payment-level Regressions (Average Effect)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Log of Medicare Counts									
lpayment	-0.03	-0.03	-0.15	0.14	0.50*	0.32	0.05	0.07	0.32**	0.26**
	(0.20)	(0.19)	(0.30)	(0.19)	(0.28)	(0.27)	(0.21)	(0.20)	(0.13)	(0.12)
	[0.22]	[0.21]	[0.68]	[0.22]	[0.63]	[0.41]	[0.29]	[0.24]	[0.20]	[0.18]
	[0.25]	[0.25]	[0.68]	[0.25]	[0.51]	[0.39]	[0.31]	[0.31]	[0.19]*	[0.20]
lcoinsur	0.06	-0.30*	0.40	-0.10	-0.85***	-0.30	-0.04	0.07	-0.22*	-0.12
	(0.20)	(0.18)	(0.29)	(0.19)	(0.28)	(0.28)	(0.21)	(0.20)	(0.13)	(0.12)
lpay_prvt	-0.09	-0.83***	-0.29	-0.15	0.18**	-0.12*	-0.08	0.12	0.14*	0.01
	(0.13)	(0.19)	(0.21)	(0.16)	(0.08)	(0.06)	(0.13)	(0.16)	(0.08)	(0.06)
totpop	0.00*	0.00**	0.00***	0.00**	-0.00	-0.00***	0.00*	0.00	0.00*	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
prop_black	-0.01	-0.05	0.01	-0.02	-0.03	0.34***	-0.06	-0.10*	-0.04	-0.02
	(0.05)	(0.05)	(0.08)	(0.05)	(0.07)	(0.07)	(0.06)	(0.05)	(0.04)	(0.03)
prop_hisp	-0.04	-0.05	-0.08	-0.06*	0.01	0.03	-0.00	-0.03	-0.03	-0.02
	(0.04)	(0.03)	(0.06)	(0.03)	(0.05)	(0.05)	(0.04)	(0.04)	(0.02)	(0.02)
prop_female	-0.23	-0.35**	-0.14	-0.62***	-0.25	-0.29	-0.36**	-0.36**	-0.05	0.18*
	(0.16)	(0.14)	(0.22)	(0.15)	(0.21)	(0.22)	(0.18)	(0.16)	(0.10)	(0.09)
prop_age65	0.18***	0.14***	0.19***	0.19***	-0.14***	0.15***	0.21***	0.20***	0.09***	0.06***
	(0.03)	(0.03)	(0.05)	(0.03)	(0.05)	(0.04)	(0.03)	(0.03)	(0.02)	(0.02)
unemprate	-0.19	-0.30**	0.26	-0.17	-0.76***	0.17	0.00	-0.29*	0.05	0.06
	(0.15)	(0.14)	(0.23)	(0.14)	(0.20)	(0.21)	(0.16)	(0.15)	(0.10)	(0.09)
unemprate2	0.02**	0.03***	-0.02	0.02**	0.05***	-0.01	0.01	0.04***	-0.00	-0.00
	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
medhhinc	-0.00	-0.00	-0.00	-0.00	-0.00***	0.00*	0.00	-0.00	-0.00	-0.00**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
medhhinc2	0.00	0.00	0.00	0.00	0.00***	-0.00	-0.00	0.00*	0.00	0.00**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ownership	-0.10	-0.04	-0.35**	-0.22*	0.35*	0.19	0.02	-0.08	0.00	0.04
	(0.13)	(0.12)	(0.18)	(0.12)	(0.19)	(0.18)	(0.14)	(0.13)	(0.08)	(0.07)
teaching	0.22	0.14	0.81*	0.21	-1.13***	0.25	0.33	0.30	-0.39**	-0.22
	(0.30)	(0.27)	(0.46)	(0.28)	(0.42)	(0.40)	(0.32)	(0.30)	(0.20)	(0.18)
acutebeds	0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	-0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
# of obs	1431	1439	1348	1433	1402	1384	1413	1432	1419	1433
R2	0.048	0.097	0.218	0.060	0.160	0.053	0.088	0.085	0.257	0.070
# of hospitals	202	204	199	204	202	201	201	203	203	203

Notes: parentheses: Standard errors; first row of brackets: Robust standard errors clustered at the county level; second row of bracket: Robust standard errors clustered at the hospital level; *** p<0.01, ** p<0.05, * p<0.1

Table 2C. Main Regression Results for non-Medicare Utilization Levels: Payment-level Regressions (Average Effect)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Log of non-Medicare Counts										
lpayment	-0.35*	-0.30*	0.16	-0.17	0.46*	0.15	-0.34	-0.29	0.02	0.21
	(0.19)	(0.18)	(0.25)	(0.18)	(0.24)	(0.25)	(0.21)	(0.19)	(0.13)	(0.13)
	[0.18]*	[0.18]	[0.53]	[0.22]	[0.44]	[0.38]	[0.31]	[0.23]	[0.23]	[0.20]
	[0.24]	[0.23]	[0.53]	[0.25]	[0.42]	[0.34]	[0.35]	[0.32]	[0.21]	[0.21]
lcoinsur	0.19	-0.21	0.04	0.08	-0.74***	-0.19	0.23	0.23	-0.01	-0.07
	(0.19)	(0.18)	(0.25)	(0.18)	(0.24)	(0.26)	(0.21)	(0.19)	(0.13)	(0.12)
lpay_prvt	0.01	-0.63***	0.05	-0.13	0.10	-0.11*	0.11	0.18	0.03	-0.03
	(0.13)	(0.19)	(0.18)	(0.15)	(0.07)	(0.06)	(0.13)	(0.15)	(0.08)	(0.06)
totpop	0.00	0.00	0.00	0.00	0.00	-0.00**	0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
prop_black	-0.03	-0.11**	0.01	-0.05	-0.04	0.24***	-0.09	-0.13***	-0.01	-0.04
	(0.05)	(0.05)	(0.07)	(0.05)	(0.06)	(0.07)	(0.06)	(0.05)	(0.04)	(0.03)
prop_hisp	0.02	0.00	-0.01	0.00	-0.01	0.04	0.07*	0.03	0.02	-0.01
	(0.03)	(0.03)	(0.05)	(0.03)	(0.04)	(0.04)	(0.04)	(0.03)	(0.02)	(0.02)
prop_female	0.05	-0.08	-0.13	-0.26*	-0.37**	-0.13	0.04	-0.08	0.25**	0.26***
	(0.15)	(0.14)	(0.19)	(0.14)	(0.18)	(0.20)	(0.18)	(0.15)	(0.10)	(0.10)
prop_age65	0.13***	0.12***	0.17***	0.14***	-0.11***	0.12***	0.14***	0.15***	0.07***	0.05**
	(0.03)	(0.03)	(0.05)	(0.03)	(0.04)	(0.04)	(0.04)	(0.03)	(0.02)	(0.02)
unemprate	-0.17	-0.15	0.21	-0.05	-0.46***	0.07	0.11	-0.13	0.02	-0.11
	(0.14)	(0.13)	(0.19)	(0.13)	(0.17)	(0.19)	(0.16)	(0.14)	(0.10)	(0.10)
unemprate2	0.02	0.02*	-0.01	0.01	0.03*	0.00	-0.00	0.02	-0.00	0.01
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
medhhinc	-0.00	-0.00	-0.00	-0.00	-0.00***	0.00**	0.00	-0.00*	-0.00*	-0.00*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
medhhinc2	0.00	0.00	0.00	0.00	0.00***	-0.00*	-0.00	0.00	0.00	0.00**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ownership	0.07	0.09	-0.22	-0.11	0.33**	0.32**	0.06	0.02	-0.03	-0.02
	(0.12)	(0.12)	(0.15)	(0.12)	(0.16)	(0.16)	(0.14)	(0.13)	(0.08)	(0.08)
teaching	0.57**	-0.08	0.73*	0.43*	-1.00***	0.28	-0.04	0.22	-0.29	-0.21
	(0.28)	(0.26)	(0.39)	(0.26)	(0.36)	(0.37)	(0.32)	(0.28)	(0.20)	(0.19)
acutebeds	0.00**	0.00***	0.00	0.00***	-0.00	0.00*	0.00	0.00*	0.00*	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
# of obs	1431	1439	1348	1433	1402	1384	1413	1432	1419	1433
R2	0.061	0.129	0.183	0.062	0.123	0.046	0.049	0.078	0.249	0.059
# of hospitals	202	204	199	204	202	201	201	203	203	203

Notes: parentheses: Standard errors; first row of brackets: Robust standard errors clustered at the county level; second row of bracket: Robust standard errors clustered at the hospital level; *** p<0.01, ** p<0.05, * p<0.1

Table 3A. Regression Results for Overall Utilization: Payment Interaction with Medicare share (Heterogeneous Response)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Log of Combined Counts (Medicare + non-Medicare)										
share_lpay	-1.60***	-0.22	-1.54***	-1.76***	-0.91***	0.41	0.10	-0.11	-1.76***	-1.62***
	(0.36)	(0.49)	(0.36)	(0.31)	(0.16)	(0.29)	(0.23)	(0.33)	(0.37)	(0.30)
	[0.74]**	[1.01]	[0.55]***	[0.56]***	[0.47]*	[0.71]	[0.65]	[0.76]	[0.67]**	[0.53]***
	[0.88]*	[0.93]	[0.63]**	[0.64]***	[0.32]***	[0.54]	[0.62]	[0.90]	[0.80]**	[0.56]***
lpayment	0.28	-0.20	0.44	0.40**	0.96***	0.08	-0.29	-0.27	0.29**	0.48***
	(0.20)	(0.22)	(0.38)	(0.20)	(0.27)	(0.31)	(0.23)	(0.22)	(0.15)	(0.14)
lcoinsur	0.12	-0.16	0.27	-0.01	-0.95***	-0.24	0.16	0.29	-0.04	-0.08
	(0.18)	(0.18)	(0.33)	(0.18)	(0.26)	(0.29)	(0.21)	(0.19)	(0.13)	(0.12)
lpay_prvt	-0.12	-0.61***	-0.11	-0.11	0.16**	-0.12*	-0.01	0.17	0.07	-0.03
	(0.12)	(0.19)	(0.24)	(0.15)	(0.08)	(0.07)	(0.13)	(0.16)	(0.08)	(0.06)
totpop	0.00**	0.00*	0.00***	0.00***	0.00	-0.00***	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
prop_black	0.01	-0.07	-0.01	-0.03	-0.03	0.32***	-0.08	-0.10*	0.00	-0.03
	(0.05)	(0.05)	(0.09)	(0.05)	(0.07)	(0.08)	(0.06)	(0.05)	(0.04)	(0.03)
prop_hisp	-0.04	-0.01	-0.14*	-0.05	0.00	-0.01	0.09**	0.01	-0.00	-0.02
	(0.03)	(0.03)	(0.08)	(0.03)	(0.05)	(0.05)	(0.04)	(0.04)	(0.02)	(0.02)
prop_female	-0.26*	-0.19	0.27	-0.53***	-0.39*	-0.71**	0.20	-0.24	0.16	0.26***
	(0.14)	(0.14)	(0.29)	(0.14)	(0.20)	(0.29)	(0.23)	(0.15)	(0.10)	(0.10)
prop_age65	0.15***	0.15***	0.27***	0.18***	-0.08*	0.17***	0.15***	0.19***	0.10***	0.06***
	(0.03)	(0.03)	(0.07)	(0.03)	(0.04)	(0.05)	(0.04)	(0.03)	(0.02)	(0.02)
unemprate	-0.11	-0.15	0.47	0.01	-0.57***	0.04	0.16	-0.12	0.07	-0.01
	(0.14)	(0.13)	(0.32)	(0.13)	(0.19)	(0.22)	(0.16)	(0.15)	(0.10)	(0.10)
unemprate2	0.02	0.02**	-0.02	0.01	0.04**	0.01	-0.00	0.02	-0.00	0.00
	(0.01)	(0.01)	(0.03)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
medhhinc	-0.00	-0.00	-0.00	-0.00	-0.00***	0.00***	-0.00	-0.00	-0.00	-0.00*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
medhhinc2	0.00	0.00	0.00	0.00	0.00***	-0.00**	0.00	0.00*	0.00	0.00**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ownership	-0.12	-0.05	-0.33	-0.24**	0.13	0.27	-0.05	-0.13	-0.06	0.02
	(0.12)	(0.12)	(0.21)	(0.12)	(0.18)	(0.19)	(0.15)	(0.13)	(0.09)	(0.08)
teaching	0.39	0.26	0.85	0.56**	-0.42	0.08	0.55	0.65**	-0.03	-0.10
	(0.30)	(0.28)	(0.56)	(0.28)	(0.42)	(0.43)	(0.36)	(0.31)	(0.22)	(0.20)
acutebeds	0.00	0.00*	-0.00	0.00	-0.00*	0.00**	-0.00	-0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
# of obs	1297	1319	1008	1313	1282	1229	1260	1305	1299	1309
R2	0.077	0.126	0.305	0.095	0.171	0.060	0.079	0.101	0.290	0.096
# of hospitals	173	175	133	175	174	165	169	174	174	173

Notes: parentheses: Standard errors; first row of brackets: Robust standard errors clustered at the county level; second row of bracket: Robust standard errors clustered at the hospital level; *** p<0.01, ** p<0.05, * p<0.1

Table 3B. Regression Results for Medicare Utilization: Payment Interaction with Medicare share (Heterogeneous Response)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Log of Medicare Counts										
share_lpay	-1.87***	-1.54***	-1.67***	-1.98***	-0.61***	0.71**	-0.24	-0.45	-1.41***	-1.69***
	(0.39)	(0.52)	(0.35)	(0.33)	(0.18)	(0.28)	(0.23)	(0.33)	(0.37)	(0.29)
	[1.01]*	[1.38]	[0.57]***	[0.59]***	[0.52]	[0.76]	[0.62]	[0.81]	[0.58]**	[0.53]***
	[1.13]*	[1.18]	[0.63]***	[0.64]***	[0.35]*	[0.53]	[0.61]	[0.92]	[0.58]**	[0.56]***
lpayment	0.52**	0.39	0.43	0.68**	0.85**	0.03	0.09	0.13	0.53***	0.55**
	(0.22)	(0.24)	(0.37)	(0.21)	(0.30)	(0.30)	(0.23)	(0.23)	(0.14)	(0.14)
lcoinsur	0.03	-0.26	0.35	-0.17	-0.97***	-0.28	-0.00	0.11	-0.25*	-0.17
	(0.19)	(0.18)	(0.32)	(0.19)	(0.29)	(0.29)	(0.21)	(0.20)	(0.13)	(0.12)
lpay_prvt	-0.12	-0.76***	-0.30	-0.06	0.18**	-0.12*	-0.12	0.12	0.14*	-0.01
	(0.13)	(0.19)	(0.24)	(0.16)	(0.08)	(0.07)	(0.13)	(0.16)	(0.08)	(0.06)
totpop	0.00***	0.00**	0.00***	0.00***	0.00	-0.00***	0.00*	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
prop_black	0.01	-0.04	-0.01	-0.00	-0.02	0.33***	-0.06	-0.08	-0.02	-0.02
	(0.05)	(0.05)	(0.09)	(0.05)	(0.08)	(0.08)	(0.06)	(0.06)	(0.04)	(0.03)
prop_hisp	-0.08**	-0.05	-0.17**	-0.08**	0.01	-0.01	0.03	-0.03	-0.04*	-0.03
	(0.03)	(0.03)	(0.08)	(0.03)	(0.05)	(0.05)	(0.04)	(0.04)	(0.02)	(0.02)
prop_female	-0.41***	-0.37***	0.32	-0.73***	-0.24	-0.74***	-0.12	-0.41***	-0.09	0.21**
	(0.15)	(0.14)	(0.28)	(0.15)	(0.22)	(0.28)	(0.23)	(0.16)	(0.10)	(0.09)
prop_age65	0.18***	0.15***	0.20***	0.21***	-0.12***	0.15***	0.20***	0.22***	0.10***	0.06***
	(0.03)	(0.03)	(0.07)	(0.03)	(0.05)	(0.05)	(0.04)	(0.03)	(0.02)	(0.02)
unemprate	-0.11	-0.25*	0.29	-0.04	-0.76***	0.06	0.10	-0.22	0.07	0.08
	(0.15)	(0.14)	(0.31)	(0.14)	(0.21)	(0.21)	(0.16)	(0.15)	(0.10)	(0.09)
unemprate2	0.02*	0.03***	-0.01	0.01	0.05***	0.00	0.00	0.03**	-0.00	-0.01
	(0.01)	(0.01)	(0.03)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
medhhinc	-0.00	-0.00	-0.00	-0.00	-0.00***	0.00**	0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
medhhinc2	0.00	0.00	0.00	0.00	0.00***	-0.00	0.00	0.00	0.00	0.00*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ownership	-0.26*	-0.13	-0.48**	-0.32**	0.12	0.08	-0.04	-0.17	-0.00	0.01
	(0.13)	(0.12)	(0.20)	(0.13)	(0.19)	(0.18)	(0.14)	(0.14)	(0.08)	(0.08)
teaching	0.45	0.47	0.96*	0.57*	-0.55	0.14	0.73**	0.61*	-0.32	0.04
	(0.32)	(0.29)	(0.55)	(0.30)	(0.46)	(0.42)	(0.35)	(0.32)	(0.22)	(0.20)
acutebeds	0.00	0.00	-0.00	0.00	-0.00	0.00**	-0.00	-0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
# of obs	1297	1319	1008	1313	1282	1229	1260	1305	1299	1309
R2	0.084	0.123	0.287	0.102	0.172	0.070	0.110	0.111	0.282	0.099
# of hospitals	173	175	133	175	174	165	169	174	174	173

Notes: parentheses: Standard errors; first row of brackets: Robust standard errors clustered at the county level; second row of bracket: Robust standard errors clustered at the hospital level; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3C. Regression Results for non-Medicare Utilization: Payment Interaction with Medicare share (Heterogeneous Response)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Log of non-Medicare Counts										
share_lpay	-1.37***	0.42	-1.22***	-1.44***	-0.90***	0.01	0.29	-0.04	-1.86***	-1.35***
	(0.35)	(0.49)	(0.31)	(0.30)	(0.15)	(0.26)	(0.23)	(0.31)	(0.37)	(0.31)
	[0.59]**	[1.00]	[0.39]***	[0.47]***	[0.42]**	[0.58]	[0.58]	[0.58]	[0.60]***	[0.36]***
	[0.72]*	[0.94]	[0.47]**	[0.58]**	[0.30]***	[0.46]	[0.56]	[0.73]	[0.76]**	[0.41]***
lpayment	0.15	-0.41*	0.71**	0.25	0.95***	0.20	-0.51**	-0.36*	0.24*	0.45***
	(0.20)	(0.22)	(0.32)	(0.19)	(0.25)	(0.28)	(0.23)	(0.21)	(0.15)	(0.14)
lcoinsur	0.13	-0.16	-0.13	0.01	-0.91***	-0.22	0.26	0.28	-0.01	-0.11
	(0.17)	(0.17)	(0.28)	(0.17)	(0.24)	(0.26)	(0.21)	(0.19)	(0.13)	(0.12)
lpay_prvt	-0.06	-0.54***	0.01	-0.06	0.11	-0.10*	0.06	0.19	0.06	-0.04
	(0.12)	(0.18)	(0.21)	(0.15)	(0.07)	(0.06)	(0.13)	(0.15)	(0.08)	(0.06)
totpop	0.00*	0.00	0.00*	0.00**	0.00	-0.00*	-0.00	0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
prop_black	-0.02	-0.10**	-0.01	-0.05	-0.00	0.26***	-0.11*	-0.13**	-0.01	-0.04
	(0.05)	(0.05)	(0.08)	(0.05)	(0.07)	(0.07)	(0.06)	(0.05)	(0.04)	(0.03)
prop_hisp	-0.03	-0.00	-0.06	-0.03	0.00	-0.02	0.12***	0.03	0.02	-0.01
	(0.03)	(0.03)	(0.07)	(0.03)	(0.04)	(0.05)	(0.04)	(0.03)	(0.02)	(0.02)
prop_female	-0.14	-0.08	0.19	-0.38***	-0.40**	-0.62**	0.45*	-0.11	0.24**	0.29***
	(0.14)	(0.13)	(0.25)	(0.13)	(0.18)	(0.26)	(0.23)	(0.15)	(0.10)	(0.10)
prop_age65	0.11***	0.12***	0.20***	0.14***	-0.06	0.15***	0.10***	0.15***	0.09***	0.05**
	(0.03)	(0.03)	(0.06)	(0.03)	(0.04)	(0.04)	(0.04)	(0.03)	(0.02)	(0.02)
unemprate	-0.12	-0.12	0.22	0.04	-0.40**	0.03	0.20	-0.08	0.09	-0.09
	(0.13)	(0.13)	(0.27)	(0.13)	(0.18)	(0.19)	(0.16)	(0.14)	(0.10)	(0.10)
unemprate2	0.02	0.02*	-0.00	0.00	0.03*	0.01	-0.01	0.01	-0.01	0.01
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
medhhinc	-0.00	-0.00	-0.00	-0.00	-0.00***	0.00***	-0.00	-0.00**	-0.00*	-0.00*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
medhhinc2	0.00	0.00	-0.00	0.00	0.00***	-0.00**	-0.00	0.00**	0.00	0.00*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ownership	-0.08	-0.04	-0.31*	-0.22*	0.11	0.26	-0.04	-0.12	-0.06	-0.02
	(0.12)	(0.12)	(0.18)	(0.12)	(0.16)	(0.17)	(0.14)	(0.13)	(0.08)	(0.08)
teaching	0.38	0.23	0.79*	0.55**	-0.42	0.14	0.40	0.61**	0.02	-0.08
	(0.29)	(0.27)	(0.48)	(0.27)	(0.39)	(0.38)	(0.35)	(0.30)	(0.22)	(0.21)
acutebeds	0.00*	0.00**	0.00	0.00**	-0.00*	0.00**	-0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
# of obs	1297	1319	1008	1313	1282	1229	1260	1305	1299	1309
R2	0.069	0.142	0.233	0.083	0.151	0.057	0.063	0.098	0.275	0.080
# of hospitals	173	175	133	175	174	165	169	174	174	173

Notes: parentheses: Standard errors; first row of brackets: Robust standard errors clustered at the county level; second row of bracket: Robust standard errors clustered at the hospital level; *** p<0.01, ** p<0.05, * p<0.1

Table 4 Robustness Check 1: Controlling for 3-digit zipcode-year dummies

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Log of Combined Counts										
share_lpay	-1.53*** (0.37) [0.86]* [0.89]*	0.11 (0.52) [1.22] [0.95]	-0.97** (0.40) [0.71] [0.67]	-1.77*** (0.33) [0.60]*** [0.62]***	-0.83*** (0.17) [0.55] [0.36]**	0.09 (0.29) [0.76] [0.55]	0.26 (0.24) [0.67] [0.58]	-0.22 (0.35) [0.75] [0.83]	-1.88*** (0.40) [0.74]** [0.79]**	-1.50*** (0.31) [0.46]*** [0.47]***
lpayment	0.26 (0.21)	-0.28 (0.24)	0.69* (0.42)	0.47** (0.21)	0.83*** (0.29)	-0.05 (0.31)	-0.41 (0.25)	-0.21 (0.24)	0.21 (0.15)	0.34** (0.15)
# of obs	1297	1319	1008	1313	1282	1229	1260	1305	1299	1309
R2	0.273	0.319	0.448	0.276	0.322	0.330	0.283	0.283	0.435	0.275
# of hospitals	173	175	133	175	174	165	169	174	174	173
Panel B: log of Medicare Counts										
share_lpay	-1.83*** (0.40) [1.18] [1.13]	-1.45*** (0.54) [1.70] [1.24]	-0.91** (0.39) [0.73] [0.66]	-1.99*** (0.34) [0.67]*** [0.61]***	-0.56*** (0.18) [0.59] [0.38]	0.37 (0.29) [0.79] [0.53]	-0.16 (0.24) [0.62] [0.54]	-0.48 (0.35) [0.80] [0.84]	-1.51*** (0.40) [0.62]** [0.62]**	-1.60*** (0.31) [0.47]*** [0.48]***
lpayment	0.41* (0.23)	0.30 (0.25)	0.50 (0.41)	0.67*** (0.22)	0.79** (0.32)	-0.05 (0.31)	0.02 (0.25)	0.14 (0.24)	0.51*** (0.15)	0.44*** (0.14)
# of obs	1297	1319	1008	1313	1282	1229	1260	1305	1299	1309
R2	0.294	0.329	0.438	0.302	0.320	0.330	0.312	0.307	0.419	0.258
# of hospitals	173	175	133	175	174	165	169	174	174	173
Panel C: log of non-Medicare Counts										
share_lpay	-1.25*** (0.36) [0.67]* [0.73]*	0.77 (0.51) [1.21] [0.99]	-1.01*** (0.34) [0.54]* [0.52]*	-1.41*** (0.32) [0.49]*** [0.55]**	-0.81*** (0.15) [0.49] [0.33]**	-0.17 (0.27) [0.64] [0.48]	0.50** (0.24) [0.58] [0.50]	-0.09 (0.34) [0.59] [0.69]	-1.94*** (0.40) [0.63]*** [0.71]***	-1.28*** (0.32) [0.31]*** [0.38]***
lpayment	0.17 (0.21)	-0.46* (0.24)	0.92** (0.36)	0.35* (0.20)	0.80*** (0.27)	-0.03 (0.29)	-0.66*** (0.24)	-0.31 (0.23)	0.17 (0.15)	0.33** (0.15)
# of obs	1297	1319	1008	1313	1282	1229	1260	1305	1299	1309
R2	0.252	0.314	0.381	0.251	0.310	0.309	0.272	0.274	0.417	0.252
# of hospitals	173	175	133	175	174	165	169	174	174	173

Notes: parentheses: Standard errors; first row of brackets: Robust standard errors clustered at the county level; second row of bracket: Robust standard errors clustered at the hospital level; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 5 Robustness Check 2: Controlling for HMO and # of MDs.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Log of Combined Counts										
share_lpay	-1.20*** (0.41) [0.68]* [0.83]	0.08 (0.55) [0.70] [0.65]	-1.72*** (0.44) [0.47]*** [0.57]***	-1.34*** (0.35) [0.53]** [0.59]**	-0.65*** (0.18) [0.39] [0.31]**	-0.17 (0.33) [0.62] [0.45]	0.17 (0.27) [0.61] [0.63]	-0.07 (0.37) [0.71] [0.85]	-1.54*** (0.46) [0.67]** [0.75]**	-1.21*** (0.35) [0.34]*** [0.33]***
lpayment	0.36 (0.24)	-0.08 (0.26)	0.40 (0.46)	0.42* (0.23)	0.65** (0.31)	-0.08 (0.36)	-0.25 (0.26)	-0.02 (0.26)	0.30* (0.18)	0.53*** (0.17)
# of obs	801	817	622	811	783	750	776	806	797	810
R2	0.095	0.182	0.317	0.092	0.209	0.092	0.071	0.139	0.163	0.076
# of hospitals	173	175	133	175	174	165	169	174	174	173
Panel B: log of Medicare Counts										
share_lpay	-1.40*** (0.45) [1.00] [1.11]	-0.78 (0.58) [0.95] [0.78]	-1.79*** (0.44) [0.51]*** [0.58]***	-1.42*** (0.37) [0.60]** [0.62]**	-0.47** (0.20) [0.41] [0.33]	0.08 (0.33) [0.65] [0.45]	-0.22 (0.28) [0.56] [0.57]	-0.43 (0.37) [0.74] [0.86]	-1.21*** (0.43) [0.52]** [0.54]**	-1.29*** (0.33) [0.37]*** [0.35]***
lpayment	0.50* (0.26)	0.34 (0.27)	0.29 (0.47)	0.59** (0.24)	0.60* (0.35)	-0.15 (0.35)	0.15 (0.27)	0.32 (0.26)	0.58*** (0.17)	0.52*** (0.16)
# of obs	801	817	622	811	783	750	776	806	797	810
R2	0.095	0.142	0.279	0.097	0.210	0.107	0.083	0.136	0.140	0.089
# of hospitals	173	175	133	175	174	165	169	174	174	173
Panel C: log of non-Medicare Counts										
share_lpay	-1.09*** (0.40) [0.53]** [0.69]	0.44 (0.54) [0.71] [0.69]	-1.49*** (0.37) [0.34]*** [0.42]***	-1.15*** (0.34) [0.44]** [0.53]**	-0.63*** (0.16) [0.35]* [0.29]**	-0.46 (0.30) [0.53] [0.40]	0.33 (0.26) [0.59] [0.61]	-0.01 (0.36) [0.54] [0.69]	-1.64*** (0.45) [0.61]*** [0.71]**	-0.99*** (0.36) [0.28]*** [0.29]***
lpayment	0.30 (0.23)	-0.20 (0.25)	0.83** (0.39)	0.35 (0.22)	0.64** (0.28)	0.07 (0.32)	-0.43* (0.26)	-0.09 (0.25)	0.24 (0.18)	0.52*** (0.18)
# of obs	801	817	622	811	783	750	776	806	797	810
R2	0.088	0.209	0.266	0.086	0.182	0.087	0.072	0.144	0.164	0.067
# of hospitals	173	175	133	175	174	165	169	174	174	173

Notes: parentheses: Standard errors; first row of brackets: Robust standard errors clustered at the county level; second row of bracket: Robust standard errors clustered at the hospital level; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 6 Robustness Check 3: Excluding Hospital-level Controls

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Log of Combined Counts										
share_lpay	-1.58*** (0.36) [0.75]** [0.87]*	-0.26 (0.49) [0.98] [0.91]	-1.52*** (0.36) [0.55]*** [0.63]**	-1.77*** (0.31) [0.57]*** [0.64]***	-0.91*** (0.16) [0.47]* [0.32]***	0.40 (0.29) [0.74] [0.54]	0.15 (0.23) [0.64] [0.64]	-0.10 (0.33) [0.76] [0.89]	-1.78*** (0.37) [0.66]*** [0.79]**	-1.62*** (0.30) [0.54]*** [0.57]***
lpayment	0.25 (0.20)	-0.22 (0.22)	0.37 (0.37)	0.38* (0.20)	1.01*** (0.27)	0.07 (0.31)	-0.30 (0.23)	-0.27 (0.22)	0.28* (0.15)	0.48*** (0.14)
# of obs	1297	1319	1008	1313	1282	1229	1260	1305	1299	1309
R2	0.073	0.123	0.301	0.086	0.167	0.055	0.077	0.097	0.289	0.096
# of hospitals	173	175	133	175	174	165	169	174	174	173
Panel B: log of Medicare Counts										
share_lpay	-1.85*** (0.39) [1.02]* [1.13]	-1.56*** (0.52) [1.35] [1.17]	-1.64*** (0.36) [0.57]*** [0.63]**	-1.99*** (0.33) [0.60]*** [0.63]***	-0.62*** (0.18) [0.51] [0.34]*	0.68** (0.28) [0.78] [0.53]	-0.17 (0.23) [0.63] [0.63]	-0.44 (0.33) [0.80] [0.91]	-1.41*** (0.37) [0.58]** [0.58]**	-1.68*** (0.29) [0.53]*** [0.57]***
lpayment	0.49** (0.22)	0.37 (0.24)	0.34 (0.37)	0.66*** (0.21)	0.90*** (0.30)	0.02 (0.31)	0.08 (0.23)	0.13 (0.23)	0.53*** (0.14)	0.55*** (0.13)
# of obs	1297	1319	1008	1313	1282	1229	1260	1305	1299	1309
R2	0.078	0.120	0.279	0.093	0.169	0.066	0.105	0.106	0.281	0.098
# of hospitals	173	175	133	175	174	165	169	174	174	173
Panel C: log of non-Medicare Counts										
share_lpay	-1.35*** (0.35) [0.60]** [0.72]*	0.38 (0.49) [0.97] [0.93]	-1.19*** (0.31) [0.39]*** [0.46]**	-1.45*** (0.31) [0.48]*** [0.58]**	-0.91*** (0.15) [0.42]** [0.30]***	-0.00 (0.26) [0.60] [0.47]	0.32 (0.22) [0.57] [0.56]	-0.04 (0.31) [0.58] [0.73]	-1.88*** (0.37) [0.58]*** [0.75]**	-1.34*** (0.31) [0.36]*** [0.42]***
lpayment	0.11 (0.20)	-0.42* (0.22)	0.64** (0.32)	0.22 (0.19)	0.99*** (0.25)	0.19 (0.28)	-0.52** (0.22)	-0.37* (0.21)	0.23 (0.14)	0.44*** (0.14)
# of obs	1297	1319	1008	1313	1282	1229	1260	1305	1299	1309
R2	0.064	0.137	0.227	0.073	0.147	0.049	0.062	0.093	0.274	0.080
# of hospitals	173	175	133	175	174	165	169	174	174	173

Notes: parentheses: Standard errors; first row of brackets: Robust standard errors clustered at the county level; second row of bracket: Robust standard errors clustered at the hospital level; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 7. Robustness Check 4: Excluding Small Rural Hospitals and Sole Community Hospitals

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Log of Combined Counts										
share_lpay	-1.80*** (0.39) [0.75]** [0.91]**	-0.28 (0.51) [1.06] [0.98]	-1.62*** (0.36) [0.57]*** [0.64]**	-1.85*** (0.32) [0.57]*** [0.66]***	-0.94*** (0.17) [0.50]* [0.34]***	0.34 (0.29) [0.72] [0.55]	0.16 (0.24) [0.67] [0.64]	-0.38 (0.33) [0.74] [0.89]	-1.59*** (0.40) [0.69]** [0.82]*	-1.65*** (0.31) [0.54]*** [0.57]***
lpayment	0.43** (0.21)	-0.15 (0.23)	0.43 (0.38)	0.46** (0.20)	0.93*** (0.28)	0.10 (0.31)	-0.24 (0.23)	-0.00 (0.22)	0.30** (0.15)	0.52*** (0.14)
# of obs	1235	1257	977	1251	1227	1181	1216	1243	1237	1254
R2	0.082	0.131	0.302	0.100	0.190	0.054	0.085	0.109	0.277	0.091
# of hospitals	165	167	129	167	167	159	163	166	166	166
Panel B: log of Medicare Counts										
share_lpay	-2.32*** (0.42) [0.96]** [1.12]**	-1.55*** (0.53) [1.44] [1.23]	-1.75*** (0.36) [0.59]*** [0.64]***	-2.09*** (0.34) [0.60]*** [0.65]***	-0.64*** (0.18) [0.55] [0.37]*	0.64** (0.29) [0.76] [0.54]	-0.21 (0.24) [0.65] [0.63]	-0.73** (0.34) [0.80] [0.91]	-1.37*** (0.39) [0.60]** [0.60]**	-1.69*** (0.30) [0.54]*** [0.57]***
lpayment	0.74*** (0.23)	0.46* (0.24)	0.42 (0.37)	0.77*** (0.21)	0.81*** (0.31)	0.03 (0.31)	0.15 (0.23)	0.40* (0.23)	0.58*** (0.15)	0.57*** (0.14)
# of obs	1235	1257	977	1251	1227	1181	1216	1243	1237	1254
R2	0.093	0.125	0.285	0.107	0.194	0.063	0.116	0.121	0.283	0.090
# of hospitals	165	167	129	167	167	159	163	166	166	166
Panel C: log of non-Medicare Counts										
share_lpay	-1.43*** (0.38) [0.61]** [0.78]*	0.37 (0.50) [1.05] [0.99]	-1.25*** (0.31) [0.41]*** [0.47]***	-1.49*** (0.31) [0.48]*** [0.60]**	-0.94*** (0.15) [0.45]** [0.32]***	-0.03 (0.26) [0.59] [0.47]	0.34 (0.24) [0.59] [0.57]	-0.25 (0.32) [0.57] [0.74]	-1.71*** (0.39) [0.61]*** [0.78]**	-1.39*** (0.31) [0.37]*** [0.42]***
lpayment	0.24 (0.20)	-0.37* (0.22)	0.72** (0.32)	0.28 (0.19)	0.94*** (0.26)	0.23 (0.28)	-0.46** (0.23)	-0.13 (0.21)	0.25* (0.15)	0.48*** (0.15)
# of obs	1235	1257	977	1251	1227	1181	1216	1243	1237	1254
R2	0.069	0.146	0.235	0.087	0.167	0.054	0.066	0.103	0.258	0.077
# of hospitals	165	167	129	167	167	159	163	166	166	166

Notes: parentheses: Standard errors; first row of brackets: Robust standard errors clustered at the county level; second row of bracket: Robust standard errors clustered at the hospital level; *** p<0.01, ** p<0.05, * p<0.1

Table 8. Robustness Check 5: Including the Transitional Corridor Payment Years

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Log of Combined Counts										
share_lpay	-1.29*** (0.32) [0.65]* [0.74]*	-0.18 (0.46) [0.91] [0.83]	-1.21*** (0.33) [0.50]** [0.55]**	-1.65*** (0.28) [0.46]*** [0.52]***	-0.83*** (0.15) [0.44]* [0.32]***	0.36 (0.25) [0.65] [0.47]	0.24 (0.21) [0.60] [0.59]	-0.02 (0.29) [0.63] [0.72]	-1.04*** (0.28) [0.62]* [0.70]	-1.34*** (0.27) [0.46]*** [0.46]***
lpayment	0.22 (0.18)	-0.17 (0.21)	0.15 (0.34)	0.38** (0.17)	0.92*** (0.25)	-0.28 (0.27)	-0.21 (0.21)	-0.18 (0.20)	0.17 (0.13)	0.39*** (0.13)
# of obs	1794	1821	1395	1815	1784	1708	1745	1804	1798	1811
R2	0.072	0.126	0.240	0.082	0.128	0.055	0.080	0.124	0.289	0.083
# of hospitals	173	175	133	175	174	165	169	174	174	173
Panel B: log of Medicare Counts										
share_lpay	-1.40*** (0.35) [0.83]* [0.89]	-1.40*** (0.48) [1.28] [1.06]	-1.28*** (0.32) [0.51]** [0.55]**	-1.72*** (0.29) [0.43]*** [0.45]***	-0.52*** (0.16) [0.46] [0.32]	0.72*** (0.25) [0.70] [0.47]	-0.03 (0.21) [0.58] [0.57]	-0.18 (0.30) [0.65] [0.71]	-0.82*** (0.29) [0.50] [0.48]*	-1.27*** (0.26) [0.36]*** [0.44]***
lpayment	0.40** (0.19)	0.39* (0.22)	0.16 (0.34)	0.58*** (0.18)	0.82*** (0.27)	-0.35 (0.27)	0.10 (0.20)	0.08 (0.20)	0.39*** (0.13)	0.46*** (0.12)
# of obs	1794	1821	1395	1815	1784	1708	1745	1804	1798	1811
R2	0.075	0.121	0.219	0.085	0.133	0.065	0.105	0.137	0.277	0.079
# of hospitals	173	175	133	175	174	165	169	174	174	173
Panel C: log of non-Medicare Counts										
share_lpay	-1.10*** (0.31) [0.54]** [0.64]*	0.43 (0.46) [0.87] [0.83]	-0.93*** (0.28) [0.35]** [0.40]**	-1.39*** (0.27) [0.41]*** [0.49]***	-0.83*** (0.14) [0.38]** [0.29]***	-0.06 (0.23) [0.52] [0.40]	0.39* (0.20) [0.53] [0.53]	-0.02 (0.28) [0.48] [0.59]	-1.09*** (0.29) [0.55]* [0.69]	-1.13*** (0.27) [0.35]*** [0.36]***
lpayment	0.12 (0.17)	-0.36* (0.21)	0.44 (0.29)	0.26 (0.17)	0.90*** (0.23)	-0.10 (0.25)	-0.40** (0.20)	-0.23 (0.19)	0.13 (0.13)	0.34*** (0.13)
# of obs	1794	1821	1395	1815	1784	1708	1745	1804	1798	1811
R2	0.064	0.135	0.183	0.072	0.114	0.047	0.066	0.113	0.263	0.072
# of hospitals	173	175	133	175	174	165	169	174	174	173

Notes: parentheses: Standard errors; first row of brackets: Robust standard errors clustered at the county level; second row of bracket: Robust standard errors clustered at the hospital level; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 9. Robustness Check 6: Excluding all Controls Except for Year Indicator Variables

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Log of Combined Counts										
share_lpay	-1.25***	-0.52	-1.46***	-1.41***	-0.90***	0.53*	0.22	0.03	-1.61***	-1.49***
	(0.36)	(0.50)	(0.36)	(0.31)	(0.16)	(0.28)	(0.23)	(0.32)	(0.37)	(0.30)
	[0.86]	[0.88]	[0.61]**	[0.61]**	[0.43]**	[0.72]	[0.59]	[0.76]	[0.63]**	[0.51]***
	[0.93]	[0.90]	[0.65]**	[0.65]**	[0.34]***	[0.53]	[0.59]	[0.84]	[0.77]**	[0.54]***
lpayment	0.08	-0.29	0.22	0.11	1.02***	-0.04	-0.36	-0.50**	0.22	0.41***
	(0.20)	(0.22)	(0.37)	(0.19)	(0.27)	(0.30)	(0.23)	(0.22)	(0.14)	(0.14)
# of obs	1297	1319	1008	1313	1282	1229	1260	1305	1299	1309
R2	0.029	0.062	0.248	0.029	0.128	0.021	0.043	0.047	0.258	0.057
# of hospitals	173	175	133	175	174	165	169	174	174	173
Panel B: log of Medicare Counts										
share_lpay	-1.39***	-1.86***	-1.64***	-1.57***	-0.65***	0.82***	-0.05	-0.25	-1.18***	-1.58***
	(0.39)	(0.53)	(0.35)	(0.34)	(0.18)	(0.28)	(0.23)	(0.33)	(0.37)	(0.29)
	[1.13]	[1.23]	[0.59]***	[0.66]**	[0.47]	[0.77]	[0.58]	[0.80]	[0.53]**	[0.48]***
	[1.19]	[1.16]	[0.65]**	[0.65]**	[0.37]*	[0.53]	[0.56]	[0.86]	[0.55]**	[0.53]***
lpayment	0.22	0.26	0.26	0.31	0.95***	-0.08	-0.06	-0.18	0.39***	0.49***
	(0.21)	(0.24)	(0.36)	(0.21)	(0.29)	(0.30)	(0.22)	(0.22)	(0.14)	(0.13)
# of obs	1297	1319	1008	1313	1282	1229	1260	1305	1299	1309
R2	0.025	0.053	0.233	0.025	0.132	0.026	0.065	0.046	0.251	0.062
# of hospitals	173	175	133	175	174	165	169	174	174	173
Panel C: log of non-Medicare Counts										
share_lpay	-1.12***	0.17	-1.05***	-1.16***	-0.88***	0.11	0.35	0.06	-1.73***	-1.19***
	(0.34)	(0.49)	(0.30)	(0.30)	(0.15)	(0.25)	(0.22)	(0.31)	(0.37)	(0.31)
	[0.68]	[0.86]	[0.42]**	[0.51]**	[0.38]**	[0.60]	[0.51]	[0.59]	[0.59]***	[0.35]***
	[0.75]	[0.90]	[0.45]**	[0.57]**	[0.31]***	[0.47]	[0.52]	[0.69]	[0.74]**	[0.40]***
lpayment	-0.01	-0.49**	0.43	0.00	1.00***	0.07	-0.53**	-0.56***	0.19	0.36***
	(0.19)	(0.22)	(0.31)	(0.19)	(0.25)	(0.27)	(0.22)	(0.21)	(0.14)	(0.14)
# of obs	1297	1319	1008	1313	1282	1229	1260	1305	1299	1309
R2	0.035	0.089	0.194	0.034	0.113	0.022	0.031	0.054	0.244	0.043
# of hospitals	173	175	133	175	174	165	169	174	174	173

Notes: parentheses: Standard errors; first row of brackets: Robust standard errors clustered at the county level; second row of bracket: Robust standard errors clustered at the hospital level; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 10 Robustness Check 7: Excluding 1997 data

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Log of Combined Counts										
share_lpay	-1.59*** (0.40) [0.73]** [0.79]**	-0.34 (0.54) [1.05] [0.97]	-1.39*** (0.42) [0.65]** [0.72]*	-1.44*** (0.33) [0.50]*** [0.58]**	-0.92*** (0.18) [0.51]* [0.34]***	0.54 (0.34) [0.82] [0.60]	0.33 (0.26) [0.60] [0.57]	0.02 (0.36) [0.67] [0.79]	-1.21*** (0.40) [0.59]** [0.75]	-1.40*** (0.31) [0.57]** [0.59]**
lpayment	0.27 (0.22)	-0.12 (0.24)	0.24 (0.40)	0.31 (0.22)	1.22*** (0.31)	0.18 (0.36)	-0.37 (0.26)	-0.32 (0.24)	0.35** (0.16)	0.55*** (0.15)
# of obs	1148	1166	892	1162	1140	1093	1116	1155	1152	1158
R2	0.071	0.094	0.305	0.083	0.151	0.058	0.088	0.096	0.331	0.099
# of hospitals	173	175	133	175	174	165	169	174	174	173
Panel B: log of Medicare Counts										
share_lpay	-2.15*** (0.44) [1.00]** [1.11]*	-1.66*** (0.57) [1.29] [1.15]	-1.60*** (0.41) [0.67]** [0.73]**	-1.82*** (0.36) [0.57]*** [0.63]***	-0.57*** (0.20) [0.56] [0.38]	0.80** (0.34) [0.89] [0.64]	-0.14 (0.25) [0.64] [0.62]	-0.48 (0.37) [0.80] [0.91]	-1.20*** (0.42) [0.60]** [0.61]*	-1.54*** (0.31) [0.58]** [0.62]**
lpayment	0.62*** (0.24)	0.42 (0.26)	0.34 (0.39)	0.69*** (0.23)	1.08*** (0.34)	0.16 (0.35)	0.07 (0.26)	0.13 (0.25)	0.66*** (0.16)	0.67*** (0.15)
# of obs	1148	1166	892	1162	1140	1093	1116	1155	1152	1158
R2	0.086	0.120	0.284	0.095	0.150	0.063	0.111	0.107	0.296	0.098
# of hospitals	173	175	133	175	174	165	169	174	174	173
Panel C: log of non-Medicare Counts										
share_lpay	-1.33*** (0.38) [0.60]** [0.65]**	0.37 (0.53) [1.02] [0.98]	-1.11*** (0.36) [0.46]** [0.52]**	-1.16*** (0.32) [0.43]** [0.54]**	-0.95*** (0.17) [0.44]** [0.31]***	0.09 (0.30) [0.65] [0.50]	0.52** (0.25) [0.54] [0.51]	0.13 (0.34) [0.52] [0.64]	-1.29*** (0.40) [0.55]** [0.72]*	-1.15*** (0.32) [0.40]*** [0.43]***
lpayment	0.13 (0.21)	-0.33 (0.24)	0.58* (0.35)	0.15 (0.21)	1.14*** (0.29)	0.28 (0.32)	-0.61** (0.25)	-0.43* (0.23)	0.29* (0.15)	0.53*** (0.15)
# of obs	1148	1166	892	1162	1140	1093	1116	1155	1152	1158
R2	0.062	0.089	0.237	0.075	0.136	0.058	0.074	0.087	0.314	0.086
# of hospitals	173	175	133	175	174	165	169	174	174	173

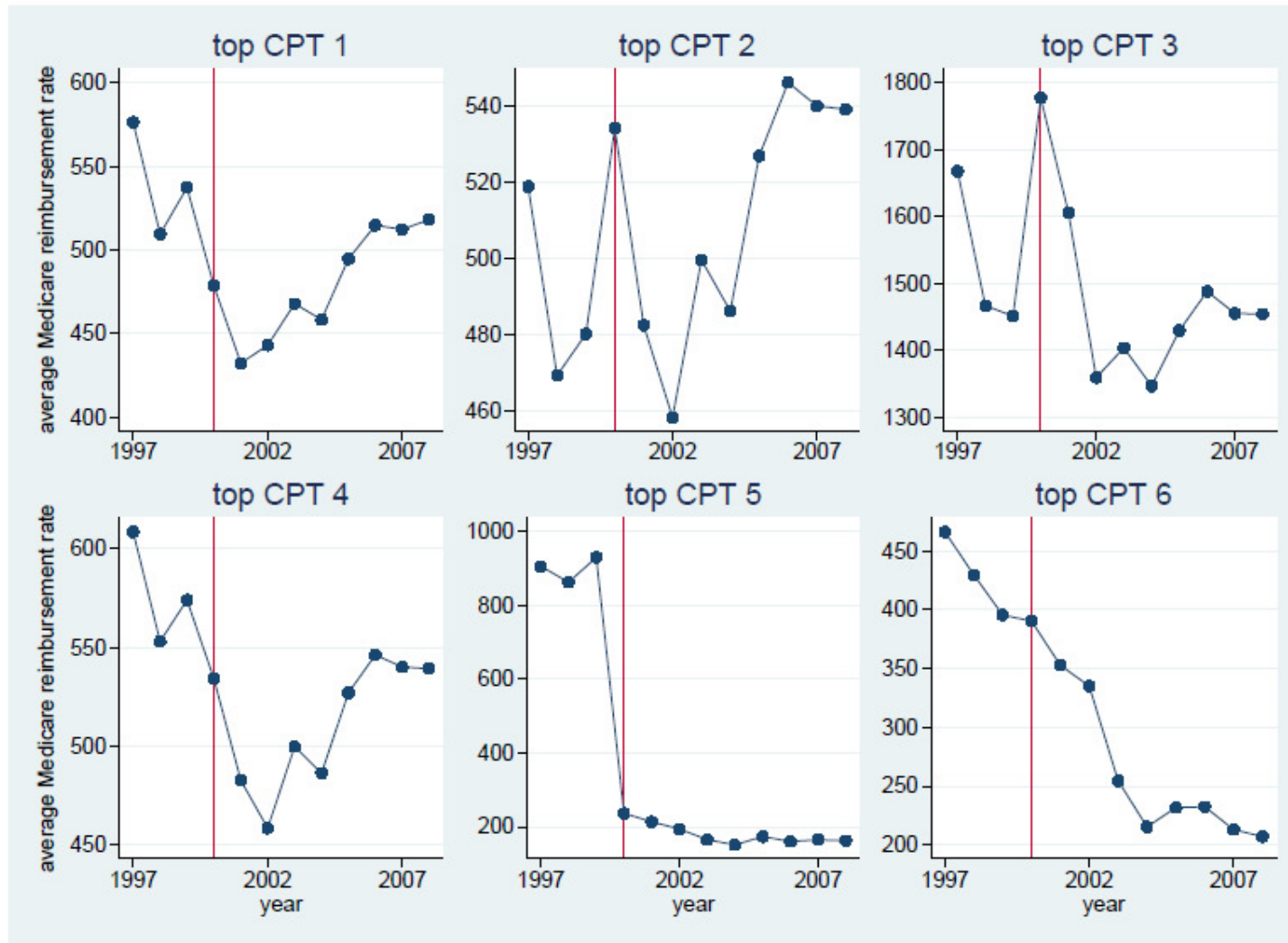
Notes: parentheses: Standard errors; first row of brackets: Robust standard errors clustered at the county level; second row of bracket: Robust standard errors clustered at the hospital level; *** p<0.01, ** p<0.05, * p<0.1

Table 11 Tests for Pre-Trends in Medicare and non-Medicare Utilization

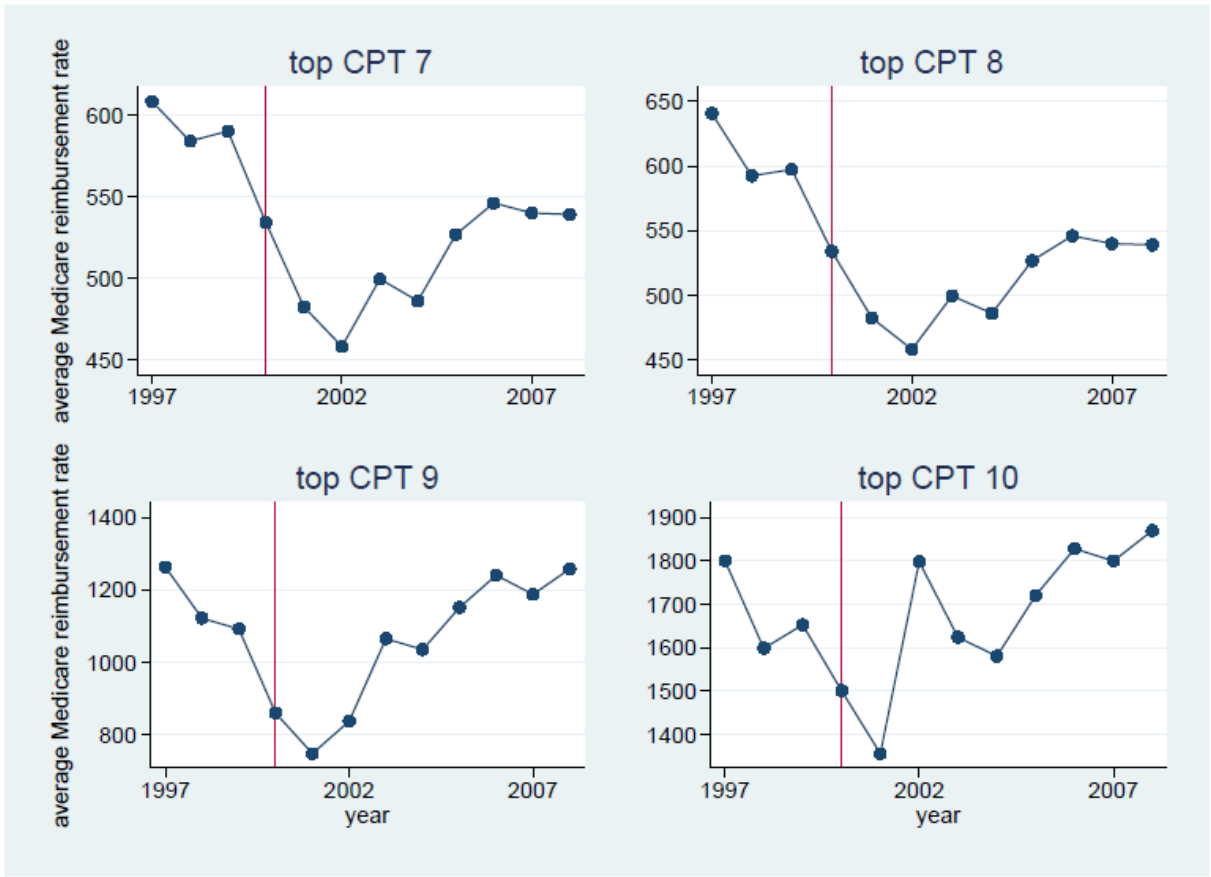
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Log of Combined Counts										
share_lpay_fake	-0.49	-0.18	0.52	-0.25	-0.08	-0.88***	-0.20	0.33	0.16	-0.67
	(0.41)	(0.41)	(0.64)	(0.32)	(0.16)	(0.31)	(0.25)	(0.38)	(0.36)	(0.60)
	[0.34]	[0.32]	[0.93]	[0.33]	[0.16]	[0.34]**	[0.27]	[0.92]	[0.33]	[0.41]
	[0.35]	[0.33]	[0.89]	[0.27]	[0.16]	[0.28]***	[0.24]	[0.69]	[0.33]	[0.48]
lpayment_fake	0.31	0.01	-1.16**	-0.05	-0.24	-0.11	0.36*	-0.17	-0.12	0.16
	(0.20)	(0.21)	(0.55)	(0.17)	(0.25)	(0.34)	(0.22)	(0.22)	(0.17)	(0.22)
lpay_prvt_fake	-0.08	-0.27*	0.09	-0.02	-0.08	-0.11	-0.12	-0.07	0.17	0.01
# of obs	468	483	355	471	441	407	454	468	454	467
R2	0.149	0.277	0.156	0.143	0.232	0.108	0.074	0.241	0.092	0.064
# of hospitals	167	172	125	168	157	145	162	167	161	166
Panel B: log of Medicare Counts										
share_lpay_fake	-0.10	-0.05	-1.00	-0.17	-0.06	-0.80**	-0.22	0.29	0.31	-0.98
	(0.50)	(0.48)	(0.65)	(0.42)	(0.19)	(0.33)	(0.29)	(0.43)	(0.42)	(0.67)
	[0.40]	[0.47]	[0.53]*	[0.35]	[0.17]	[0.30]**	[0.15]	[0.82]	[0.32]	[0.64]
	[0.40]	[0.38]	[0.52]*	[0.34]	[0.19]	[0.29]***	[0.20]	[0.60]	[0.36]	[0.69]
lpayment_fake	0.03	-0.20	-0.15	-0.24	-0.59**	-0.33	0.33	-0.22	0.09	0.23
	(0.24)	(0.24)	(0.56)	(0.22)	(0.28)	(0.36)	(0.25)	(0.25)	(0.20)	(0.25)
# of obs	468	483	355	471	441	407	454	468	454	467
R2	0.074	0.155	0.137	0.085	0.224	0.074	0.071	0.127	0.057	0.069
Number of hospitals	167	172	125	168	157	145	162	167	161	166
Panel C: log of non-Medicare Counts										
share_lpay_fake	-0.64	-0.00	1.40**	-0.29	-0.15	-0.56*	-0.24	0.18	-0.07	-0.11
	(0.42)	(0.44)	(0.59)	(0.36)	(0.16)	(0.32)	(0.26)	(0.39)	(0.36)	(0.63)
	[0.37]*	[0.38]	[0.85]	[0.39]	[0.13]	[0.30]*	[0.30]	[0.91]	[0.34]	[0.54]
	[0.37]*	[0.34]	[0.80]*	[0.33]	[0.14]	[0.26]**	[0.26]	[0.68]	[0.33]	[0.52]
lpayment_fake	0.42**	0.03	-1.27**	0.07	0.11	-0.03	0.49**	0.01	-0.11	0.09
	(0.21)	(0.23)	(0.51)	(0.19)	(0.24)	(0.34)	(0.22)	(0.22)	(0.17)	(0.23)
# of obs	468	483	355	471	441	407	454	468	454	467
R2	0.189	0.300	0.139	0.151	0.199	0.130	0.108	0.286	0.104	0.074
# of hospitals	167	172	125	168	157	145	162	167	161	166

Notes: parentheses: Standard errors; first row of brackets: Robust standard errors clustered at the county level; second row of bracket: Robust standard errors clustered at the hospital level; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Figure 1. Time Trend in Average Medicare Payment Rate for the Top 10 Surgical Procedures



(continued next page)



Notes: The average Medicare payment rate is reported in 2008 dollars. The red vertical line indicates the year of 2000.