Who Benefits when the Government Pays More? Pass-Through in the Medicare Advantage Program *

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Abstract

Governments contract with private firms to provide a wide range of services. While a large body of previous work has estimated the effects of that contracting, surprisingly little has investigated how those effects vary with the generosity of the contract. In this paper we examine this issue in the Medicare Advantage (MA) program, through which the federal government contracts with private insurers to coordinate and finance health care for 16 million Medicare recipients. To do this, we exploit a substantial policy-induced increase in MA reimbursement in metropolitan areas with a population of 250 thousand or more relative to MSAs below this threshold. Our results demonstrate that the additional reimbursement leads more private firms to enter this market and to an increase in the share of Medicare recipients enrolled in MA plans. Our findings also reveal that about one-sixth of the additional reimbursement is passed through to consumers in the form of better coverage. A somewhat larger share accrues to private insurers in the form of higher profits and we find suggestive evidence of a large impact on advertising expenditures. Our results have implications for a key feature of the Affordable Care Act that will reduce reimbursement to MA plans by $156 billion from 2013 to 2022.

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1 Introduction

Governments often contract with private firms to provide publicly financed goods and services. The scope of these contracting arrangements is large, representing 10% of GDP in the U.S. in 2008 (OECD, 2011). The range of industries, goods and services is also vast, ranging from defense contractors making military helicopters to landscaping companies mowing the lawns of publicly-owned property. Private firms are also increasingly involved in social services such as education and health care. Theoretically, "contracting out" could lead to improved efficiency, given that private firms have powerful incentives to control costs. Additionally, if the government contracts with multiple firms (or includes a government option), consumers may have access to more choice. This can improve consumer surplus in two ways: additional competition can lead to quality improvements and private firms may more effectively cater to heterogeneous consumer preferences.

An important example of "contracting out" can be seen in the Medicare program, which currently provides health insurance to 53 million U.S. residents, with total expenditures estimated to have exceeded $600 billion in 2013 (CMS, 2013; CBO, 2013). For most Medicare recipients, the federal government directly reimburses hospitals, physicians, and other health care providers on a fee-for-service basis. However, for 16 million (and 30 percent of all) Medicare recipients, the federal government instead contracts with private insurers and other organizations to coordinate and finance medical care as part of the Medicare Advantage (MA) program. This paper examines the MA market and explores how the quality of private provision changes as the generosity of the contract increases.

A large body of previous research has investigated the effect of Medicare Advantage on Medicare expenditures, health care utilization, and health outcomes (Afendulis et. al. 2013, Landon et. al. 2012, Lemieux et. al. 2012). A related strand of research has explored how MA enrollment is affected by the generosity of plan reimbursement (Cawley et. al. 2005, Pope et. al. 2006). Yet, surprisingly little research has investigated how the characteristics of Medicare Advantage coverage vary with the generosity of plan reimbursement.[1] Theoretically, one would expect plan payment rates to influence both the quality of coverage offered by private insurers and the entry

[1] Gowrisankaran, Town, and Barrette (2011) consider the efffect of MA plan reimbursement on the presence of drug coverage. However, they do not examine reimbursement's effect on other plan characteristics. In a more recent paper, Cabral et al (2014) consider a broader set of outcomes during the 1998 through 2003 period and we discuss this paper further below.

decisions of some insurers. This gap in the literature is unfortunate, given that a key feature of the recently enacted Affordable Care Act gradually lowers reimbursement to MA plans by an estimated $156 billion from 2013-22 (CBO, 2012). While the Congressional Budget Office and others have estimated that these lower payment rates will reduce MA enrollment, there is little evidence on how the number of options and the quality of coverage will change for those who remain in the program.

In this study, we aim to partially fill this gap in the literature by exploiting policy-induced variation in the generosity of MA plan reimbursement. We begin with an illustrative model with a linear demand curve that shows the impact of plan reimbursement under perfect as well as imperfect competition. In this model, as an insurer makes its coverage more generous in response to an increase in reimbursement, more Medicare recipients are likely to enroll. If these marginal enrollees are more costly, then even with perfect competition, the inframarginal enrollees will not receive the full benefit of the additional reimbursement. Altogether, our model formalizes how the degree of selection affects the incidence of MA reimbursement, under perfect competition. Theoretically, imperfect competition could also reduce pass-through. Under imperfect competition, even if there is no difference between the marginal and the average MA enrollee, there will be less than full pass-through of benefits. We use our model to consider the factors, including plan entry, affecting incidence under imperfect competition.

Our empirical results exploit geographic variation in MA reimbursement. MA reimbursement levels are set at a county-level and are also individually risk-adjusted; the amount that a plan is paid for any given enrollee is approximately equivalent[2] to the MA benchmark in their county of residence, multiplied by that enrollee's risk score (Brown et. al., 2014). The county benchmark, meanwhile, is largely a function of each county's per-person Medicare fee-for-service (FFS) spending levels; plans are paid more in areas with high fee-for-service spending, such as Miami, Florida, than in areas with low FFS spending, such as Minneapolis, Minnesota. However, in counties with relatively low FFS spending, benchmarks are set at a level higher than that county's FFS spending, otherwise known as a payment floor. In 1998, the federal government introduced this minimum benchmark to encourage plan entry in counties with low FFS spending. Initially, the payment floor

[2] Under the bidding system in effect since 2006, if a plan bids below the county benchmark, 25 percent of the difference between the bid and the benchmark is refunded to the federal government.

was uniform across all counties. However, in 2001, the payment floor was set to be approximately 10.5% higher in counties belonging to metro areas with more than 250,000 residents.

We investigate whether this policy-induced variation in the generosity of MA reimbursement affects the quality of insurance coverage, the utilization of medical care, and health outcomes. The relationship between per-capita Medicare FFS expenditures and the county-level benchmark in 2004 is shown in Figure 1. As this figure demonstrates, counties with relatively low FFS spending have benchmarks that correspond to the payment floor. Furthermore, this figure documents the two different payment floors, applying to urban (metro area with population of 250k or more) and non-urban (249k or less) counties, respectively.[3] To estimate the impact of plan reimbursement levels, we compare counties in MSAs with a population of 250k or more, which have the higher payment floors, with similar counties below this threshold. Our specifications control flexibly for both the county and the MSA population while also controlling for the level of per-capita FFS expenditures in the county.

We focus primarily on counties with low per-capita fee-for-service spending, in which the payment floors described above will typically be binding, and on counties located in MSAs with populations relatively close to the 250 thousand threshold so that we obtain urban and non-urban counties that are more comparable. We examine the sensitivity of our results to the choice of bandwidth and to our controls for metro and county population. We also show graphically how our key outcome variables vary on either side of the population threshold. To investigate further whether there are other factors beyond MA reimbursement status that vary with a county's urban status, we estimate a companion set of results for counties with high fee-for-service expenditures and in a time period before the urban floor was introduced, with each serving as a useful falsification test for our analyses.

Our first set of empirical results demonstrate that in counties with the additional reimbursement (due to the urban floor), there are on average 1.8 additional insurers and that the average HHI is lower by 873. These effects are substantial, given that our control counties (belonging to 100-249k metropolitan areas) have an average of 6.0 insurers and an HHI of 4037. Our results are not sensitive to the choice of bandwidth and we find no corresponding differences before 2001

[3] For reasons that we explain in more detail below, the relationship becomes somewhat hazier in the next few years, as shown in Appendix Figure 1. It is also worth noting that for the 67% of counties that belong to single-county metro areas, the county and metro populations are identical.

(when the urban threshold was introduced) or for high FFS counties (where urban status should have little impact). This first set of results indicates that the more generous reimbursement induces more insurers to enter the MA market and that individuals enrolled in MA then have more plans from which to choose.

We next estimate the effect of the additional reimbursement on the fraction of Medicare recipients enrolling in MA. All else equal, a higher level of reimbursement would make the marginal MA enrollee more profitable for health insurers, which would lead insurers to aim for higher enrollment. Plans might achieve this by, for example, improving the quality of their coverage or by advertising more intensively. Consistent with this, we estimate that the 10.5 percent increase in plan reimbursement in urban counties leads to a 13.1 percentage point increase in enrollment in MA plans. These estimates are similar for alternative analysis samples and, as expected, are not present for high FFS counties or prior to 2001.

Given this evidence of greater competition in markets with higher MA payments, we next explore the impact on plan price and quality. Here, we find much more modest effects. For example, we find that the 10.5 percent increase in reimbursement resulting from a county's urban status does not translate into significantly lower monthly premiums. Estimates that incorporate additional expected out-of-pocket costs to consumers suggest that less than one-sixth of the additional reimbursement is passed through, and we can rule out pass through of more than 45 percent at the 95 percent level of confidence. These findings suggest that less than half of the additional reimbursement is passed on to consumers through lower premiums, deductibles, or co-payments.

Of course, plans may respond to reimbursement increases by improving the quality of medical care, rather than decreasing their enrollees' financial costs. For example, plans could contract with better providers, cover additional services, or expand the breadth of their provider networks in response to the additional revenues. To investigate this possibility, we use detailed individual-level data from the Consumer Assessment of Healthcare Providers and Systems (CAHPS), which contains information on MA plan satisfaction ratings, utilization, and health outcomes for approximately 160,000 MA enrollees per year. We find no evidence of increased patient satisfaction or increased utilization of care in urban floor counties, relative to their non-urban counterparts. Similarly, we find no impact on self-reported (overall or mental) health or satisfaction with care. Finally, while selection and composition effects could partially explain low pass-through, we find no evidence of

significant compositional differences across our payment threshold.

Taken together, our results indicate that the increased reimbursements paid to floor counties above the 250 thousand threshold substantially increase the number of enrollees in Medicare Advantage, even though plan quality is not substantially different. Not only is this inconsistent with a model of perfect competition, but it presents a puzzle even under the presumption of imperfectly competitive insurers. How could insurers increase enrollment in counties above the MSA population threshold, without making significant changes to plan quality? We present suggestive evidence that firms accomplish this by advertising more aggressively in counties with higher benchmarks.[4]

The recently enacted Affordable Care Act instituted many changes to the Medicare Advantage program, including a reduction in the generosity of MA reimbursement, with the magnitude of these reductions growing steadily over time. Our estimates indicate that the financial incidence of these cuts will fall to a significant extent on the supply side of the market. While we cannot measure the direct impact on firm profitability, we can look to stock returns as a proxy. In April 2013, following reversals of planned cuts to the MA program, the stock market valuation of major health insurers rose substantially (see Figure 2).[5] At the same time, the stock price of the largest publicly traded hospital operator (HCA) was unchanged. Given that insurers, rather than providers, appear to be the primary beneficiaries of MA reimbursement increases, it appears that insurance operators have the predominant market power.

While we argue that market power rationalizes our empirical results, we do not discuss the potential sources of that market power. Previous work on Medigap (Starc, 2014) has emphasized the importance of brand preferences and marketing. In the Medicare Advantage market, various behavioral biases including inertia (Nosal, 2013) and price salience (Newhouse and McGuire, 2014 and Stockley et. al., 2014), have been suggested and explored. These models have different implications for policy makers, and distinguishing between them is an important avenue for future research.

The paper is organized as follows. Section 2 describes the Medicare Advantage program and Section 3 describes our theoretical framework. Section 4 describes the data on Medicare Advantage

[4] The increase in advertising spending, meanwhile, suggests that not all of the rents associated with market power are captured by insurers. To the extent that the market for hospital or physician services is imperfectly competitive, some of the benefits of additional reimbursement may be passed through to them as well.

[5] See Al-Issis and Miller (2013) for an examination of the effect of the Affordable Care Act on the stock prices of a broader set of firms in the health care sector.

enrollment, cost, and quality along with insurer participation; it also outlines our identification strategy. Section 5 presents our results, and Section 6 concludes.

2 The Medicare Advantage Program

First introduced in 1982 as Medicare Part C, the forerunners to contemporary Medicare Advantage plans allowed consumers to opt out of traditional fee-for-service (FFS) Medicare and into private managed care plans. The federal government hoped to achieve quality as well as cost improvements by harnessing competition between private insurers (see McGuire, Newhouse, and Sinaiko 2011, for a comprehensive history). In contrast to the FFS framework used by Medicare, private Medicare Advantage plans provide care through a managed care model. Under traditional FFS, patients have substantial freedom in selecting physicians as well as treatment options, with relatively few restrictions placed on the scope of care. Under managed care, greater restrictions exist on physician access, with consumers often limited to a plan's provider network. Furthermore, many managed care plans require special approval for specialist visits and certain procedures. They may also make efforts to coordinate patient care, which could yield efficiency improvements.

2.1 Plan Description

While all Medicare Advantage plans must cover the services that are included under traditional Medicare Parts A and B, individual plans can differ in the supplemental benefits that they provide, such as vision or prescription drug coverage. Plans can also differ in their financial characteristics, including the premium charged and consumer co-payments (which affect the level and variance of predicted out-of-pocket costs). Private insurers can enter county-level markets by offering a variety of plans, and an insurer can selectively introduce a Medicare Advantage plan to certain counties and not to others. An insurer can offer multiple plans within the same county and vary the characteristics of these plans. However, Medicare Advantage plans are guaranteed-issue, and the insurer is required to offer coverage to all interested Medicare recipients in the counties in which a given plan is active.

Plans can also differ in the specific type of managed care framework that they utilize. All Medicare Advantage plans were operated as health maintenance organizations (HMOs) through

2003. However, following the passage of the Medicare Modernization Act, these plans could also operate as POS (point of service), PPO (preferred provider organization), or PFFS (private fee-for-service). HMO, POS, and PPO plans all rely on provider networks, while PFFS plans were not required to construct networks prior to 2011. Medicare Advantage HMO plans do not allow enrollees to see physicians or hospitals outside of their provider network, barring a medical emergency. POS enrollees, meanwhile, have the option of visiting physicians and hospitals outside of the network, but require explicit approval to do so. Under PPO plans, out-of-network physician visits would not require plan approval, but would entail greater cost sharing. Finally, as part of PFFS plans, enrollees would have the option to visit any physician, so long as that physician accepts the payment terms of the PFFS plan (cost sharing terms for the patient would remain the same across all physicians). Differences between these plan types could ultimately shape insurers' market entry decisions, in terms of the plan types offered within a county. For instance, given that PFFS plans are not required to form provider networks, the fixed costs of market entry for PFFS plans could be much lower than for other types of plans.

2.2 Plan Reimbursement

Payments to Medicare Advantage plans are based on payment benchmarks, which correspond to a given enrollee's county of residence. The benchmark payment is risk-adjusted for that enrollee's demographic and health characteristics. Originally, county-level payment benchmarks for Medicare Advantage plans were set at 95% of a county's per enrollee, risk-adjusted Medicare fee-for-service spending. The Centers for Medicare and Medicaid Services (CMS) introduced a payment floor in 1998, primarily to encourage plan entry to rural counties. However, as a by-product, government spending on MA enrollees in many counties (particularly rural ones) came to exceed spending on similar enrollees in Medicare FFS. In 2001, CMS introduced a second payment floor, which was set at an approximately 10.5 percent premium to the existing one, and which applied only to urban counties. CMS defined a county as "urban" if the metropolitan area in which it is included had a population of 250 thousand or more.

The relationship between a county's average per-capita fee-for-service spending and its benchmark, as of 2004, can be seen in Figure 1. As this figure shows, counties with relatively low FFS spending had benchmarks set at the payment floor. More specifically, a non-urban county with

average per-capita FFS spending below $555 per month had a floor of $555 while an urban county with average per-capita FFS spending below $613 had a floor of $613. Counties with per-capita FFS spending above $613 were in this year essentially unaffected by the payment floor while only urban counties between $555 and $613 are affected. As the figure shows, the magnitude of the impact of the payment floor is quite substantial for some counties. Consider an urban county with per-capita FFS spending of $500. Its benchmark is 23 percent greater than it would be in the absence of the payment floor. The corresponding gap is considerably smaller for an urban county with per-capita FFS spending of $600, where the floor increases the benchmark by just 2 percent.

Our analysis focuses on the 2007-2011 period, throughout which payment floors continue to be functionally (albeit not formally) present; benchmarks after 2004 were set at the highest of the previous year's benchmark (adjusted for inflation) or a county's average FFS level. As such, 2004 floor counties would have 2007-2011 benchmarks set at the inflation adjusted 2004 floor rates, so long as the inflation adjusted floor, from 2004, exceeded that county's contemporaneous FFS costs. Ultimately, over 90% of the original, 2004 floor counties remained floors in the subsequent period. The relationship between benchmarks and a county's average per-capita fee-for-service spending, for this period, can be seen in Appendix Figure I; as expected, this relationship is largely consistent with what was observed in 2004, though it becomes somewhat less tight.[6]

In 2003, the Medicare Modernization Act introduced an additional component to the reimbursement mechanism, in the form of a bidding system. Beginning in 2006, if a firm placed a bid that was lower than the existing reimbursement benchmark, 25% of the difference got returned to the federal government. The remaining 75% got passed back to plans, and had to fund services not covered by traditional Medicare or be passed on to consumers. In the first year of these bids, CMS estimated that 65% of these rebates went towards part A and B cost-sharing reductions, 14% towards providing non-traditional benefits (vision, etc.), 4% towards reducing part B premiums, and 16% towards part D benefits and premium reductions (CHS, 2006).[7]

[6] To the extent that a county's FFS level rose above the floor level in one or more years, its benchmark would subsequently exceed the inflation-adjusted floor. This explains why some counties in 2007 have a benchmark above the linear relationships displayed in Figure 1. Similarly, counties with non-binding 2004 floors would have subsequent rates that always exceeded the corresponding, inflation adjusted floor level, irrespective of their subsequent FFS costs. After 2004, a county can go from being floor to non-floor, but cannot go from being non-floor to floor.

[7] Song et al (2013) explore the effect of benchmark changes on plan bids. They instrument for the county benchmark with the growth of FFS spending in other counties in the state and with the national changes in benchmarks (which in dollar terms are larger for those counties with higher baseline FFS spending). However, this identifying variation is unlikely to be exogenous, given the many factors with which initial benchmark levels & state-level FFS growth

A number of papers highlight the beneficial effects of competition in Medicare Advantage, on characteristics such as premium costs (Town and Liu, 2003, Lustig, 2010) and out-of-pocket payment levels (Dunn, 2011). Separately, a literature has examined firm entry in this market (Chernew et. al., 2005, Pizer and Frakt, 2002, and Frakt, Pizer, and Feldman, 2009), and a broad literature has considered other aspects of the program, including consumer choice (Dafny and Dranove, 2008), and disparities in health care (Balsa, Cao, and McGuire, 2007). A number of papers have examined the impact of MA enrollment on mortality: Gowrisankaran, Town and Barrette (2011) find no effect for plans with drug coverage and increased mortality for plans without drug coverage, which we measure. By contrast, in a later period, Afendulis, Chernew, and Kessler (2013) find evidence of reduced mortality in a later time period. Our paper adds to this literature by examining the effect of policy-induced changes in plan generosity on market structure, MA plan enrollment, and on the financial and non-pecuniary generosity of MA coverage.

Our paper also adds to an expanding literature on the role of insurance market competition in shaping negotiations with providers (Ho and Lee, 2013, Gowrisankaran, Nevo, and Town, 2013), and premiums (Dafny, 2010, Dafny, Duggan, and Ramanaryan, 2012). Furthermore, our paper is similar in spirit to a number of papers that evaluate the impact of the Medicare program on private insurers and consumers (see Cabral and Mahoney, 2013 and Starc, 2014 on Medigap, Abaluck and Gruber, 2011, Ketcham et. al., 2012, Kling et. al., 2012, or Einav, Finkelstein, and Schrimpf, 2013 on demand in Medicare Part D, and Clemens and Gottleib, 2013 on the relationship between public and private reimbursement). Finally, Gaynor and Town (2012) provide a nice summary of competition in health care markets more broadly.

In a complementary study to the current one, Cabral et. al. (2014) examine the effect of the payment floor for urban counties on plan premiums and on other measures of plan quality during the 1998 through 2003 period. The authors utilize the phase-in of the urban floors we study, allowing them to control for time-invariant differences across counties. However, their study period preceded the introduction of Medicare Part D and the shift to both risk adjustment and a bidding system for Medicare Advantage.[8] Our study complements theirs by exploring pass-through across

rates may be associated. One of the many outcome variables that we consider below is the plan rebate, which is three-fourths of the difference between the bid and the benchmark.

[8] These significant changes to the MA program may have affected the degree of pass-through from this earlier period. Also whereas essentially all counties have at least one MA plan in recent years, during the 1998 through 2003

a wider range of floor counties and during a time of MA growth. Despite these differences, the Cabral et. al. estimate of a 45 percent average pass-through rate lies (just) within our confidence interval. Both studies argue that imperfect competition plays an important role in determining the effect of the program on consumers.

3 Theory

This section describes the theoretical framework that informs the empirical specifications and highlights the fact that incidence depends on the degree of competition in the market as well as selection. For simplicity, we consider the case of linear demand. Under perfect competition and constant marginal costs (perfectly elastic supply), we expect full pass-through of reimbursements to consumers.[9] However, competition may be imperfect and there may be (adverse or advantageous) selection (conditional on any risk adjustment). Just as manufacturers face upward sloping supply curves because the last plant location is not as efficient as the first plant location, insurance companies may face upward sloping average cost curves as well. If there is advantageous selection, then the marginal Medicare Advantage consumer is sicker and more costly to insure than the average. The average cost curve for a plan traces out costs from those who value the plan the most to those who value it least. Under advantageous selection, the low cost enrollees have the highest valuation for Medicare Advantage plans. In this case, we should expect a pass-through rate of less than one. As the amount of the subsidy increases, Medicare Advantage penetration rates increase, and sicker consumers begin to enroll in plans. As a result a dollar increase in the subsidy must fund the health costs of the sicker enrollees in addition to providing additional benefits to existing enrollees. Figure 4 illustrates that incomplete pass-through under advantageous selection into Medicare Advantage policies.[10] Let AC_1 be average costs under initial reimbursement generosity. If generosity in-

period, just one-in-eight counties had an MA plan in all years. The incidence of the payment floors for this select set of counties - not all of which were floor counties - may be different from the broader set of floor counties that were ultimately affected. Similarly, while MA enrollment declined steadily during their study period (from 18 percent in 1999 to 13 percent by 2003), it has steadily increased in more recent years, from 13 percent in 2005 to 30 percent in 2014. It is possible that the average incidence of reimbursement in floor counties is different during a period of program contraction from during a period of expansion. The authors also do not have data on enrollees' ratings of their health plans, which would incorporate factors such as broader or better provider networks.

[9] Therefore, the reimbursement is optimal when the marginal consumer in Medicare Advantage places a value on the additional coverage provided at an amount equal to the shadow price of public funds.

[10] We collapse this average out-of-pocket cost to an effective price p and assume no differences in plan quality. We will relax this assumption in the empirical section and explore the relationship between contract generosity and plan

creases by some amount m, there is a downward shift in the insurer's average cost curve to AC_2. If demand were completely inelastic, the price would fall from p_1 to $p_1 - m$. However, if demand is not completely inelastic, the price will fall to some intermediate level p_2: the incidence of the increased generosity depends on the relative elasticity of supply (determined by selection) and demand.[11]

Furthermore, various studies (Dafny, 2010, Lustig, 2010, and Starc, 2014) have argued that perfect competition is a poor benchmark in insurance markets, and the incidence of the MA subsidy also depends on market structure. Consider pass-through under monopoly. Figure 5 shows a downward shift of the average cost curve and assumes no selection; the marginal consumer and average consumer are the same. When the monopolist sets price equal to marginal revenue, the decrease in price is smaller than under perfect competition because the marginal revenue curve is steeper than the demand curve. In our example with constant marginal costs, linear demand would imply a pass-through rate of one-half, as the marginal revenue curve is twice as steep as the demand curve. Advantageous selection amplifies this effect. Therefore, both advantageous selection and imperfect competition theoretically reduce pass-through rates. Weyl and Fabinger (2013) expand this analysis to intermediate cases and more flexible models of demand. They find that the less competitive the conduct in a market is, the smaller the pass-through rate.[12]

In addition, more firms may enter as a result of increased plan generosity. If entry is costly, then an increase in government benefits could induce additional firms to enter. This is socially beneficial if the benefits to consumers in the form of increased competition and product variety are greater than the additional fixed costs incurred and the deadweight loss of taxation to fund any increase in Medicare spending. However, if increased generosity spurs excess entry, fixed and marketing expenditures are real economic costs. A model describing the full strategic interaction of imperfectly competitive firms is outside the scope of this paper; however, we can describe the strategic decisions made by insurers.

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quality.

[11] The intuition is reversed if there is adverse selection. Pass-through is greater than one because the increased subsidy serves to internalize part of the asymmetric information problem. If there is relatively little selection (and thus a flat AC curve) and the market for MA plans is perfectly competitive, then virtually all of the additional spending passes through to consumers in the form of a lower premium.

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[12] Similarly, Mahoney and Weyl (2013) specifically consider the case of selection markets.

First, the firm must decide which markets to enter. Second, conditional on being active in a market, they must design insurance products, and then set premiums for those insurance products. Finally, the firm may choose to make ongoing quality investments over the course of the year, and earn variable profits on each policy. If the discounted sum of future variable profits is higher than the fixed cost of entry, the firm enters the market.[13] Therefore, in order to predict firm entry and the associated increase in competitive pressure, we are interested in a comparative static that links benchmarks to firm variable profits. This comparative static depends on four effects.

The first is the *direct effect*, where increased benchmarks lead to higher reimbursements for firms. The second is a *price effect*: for the same vector of bids, an increased benchmark means a lower price for consumers, depending on the pass-through rate.[14] Third, there is a *cost effect*, where higher benchmarks could change the composition of enrollees. For example, increasing penetration rates may lead to firms attracting sicker consumers, increasing costs, if there is advantageous selection in the market. Finally, there is a *market power effect*, in which high benchmarks may lead to more entry. As more firms enter, consumers have access to more plans that may prove to be closer substitutes, driving down markups. The overall effect of more generous plan reimbursement is ultimately an empirical question.

4 Data and Identification Strategy

We use a number of administrative datasets from CMS that contain MA plan enrollment levels, the number and type of MA plans, plans' financial generosity, survey measures of plan quality and patient utilization, government payment amounts to Medicare Advantage plans, and FFS spending levels per enrollee. We construct measures of MA enrollee composition at a plan, county, as well as year level, using CAHPS survey data and Medicare enrollment data. These data are nationwide

[13] A firm f may have a number of products j in market m. The firms variable profits from that policy can be written as:

$$\pi_{jm} = \sum_i (b_m + p_j - c_{ijm})\, s_{ijm}$$

where b_m is the benchmark (which in practice is adjusted by the individual's risk score), p_{jm} the plan's premium (if any), c_{ijm} the cost of individual i covered by plan j in market m, and s_{ijm} the probability that the same consumer purchases the plan. In order to get firm-level variable profits in a given market, aggregate over all plans within a market offered by the firm and subtract any fixed or sunk cost of entry.

[14] A higher benchmark need not change the competitive environment or optimal prices; increased benchmarks may simply affect firm profits by increasing quantity, as decreased premiums may increase Medicare penetration rates, and, therefore profits.

in scope, covering more than three thousand US counties.

We initially differentiate between three types of counties - those with monthly per-capita FFS spending below $662 in 2007, those between $662 and $732, and finally those above $732. For the first group, for any given level of FFS spending, the benchmark is typically 10.5 percent higher in urban counties than in non-urban counties and is set at the payment floor. For the third group, the benchmarks are essentially the same in each of the two types of counties for any given level of FFS spending. And for the second group, the gap in benchmarks between the two counties declines linearly from about 10.5 percent at per-capita FFS spending of $662 to 0 by $732. Urban counties in this group typically have their benchmarks set at the payment floor while non-urban counties do not.

Figure 1 shows the relationship between average fee-for-service expenditures and county benchmarks for the three types of counties as of 2004, while Appendix Figure I presents the comparable relationship for 2007[15]. As these figures show, the effect of being designated an urban county (in a metropolitan area with 250 thousand or more residents) is largest for those with average fee-for-service spending below $662 and this effect declines steadily from that threshold to the threshold of $732, at which point the floor no longer binds for urban counties. It is worth noting that a county's floor status can change from one year to the next. More specifically, a floor county in which per-capita FFS spending grows relatively rapidly may move out of the floor category. This is of course more likely for counties close to the kinks in the schedule displayed in Figure 1. Rather than redefining the floor "treatment" each year, we use a county's 2007 FFS expenditures and its status as an urban or non-urban county in that year as our primary source of variation in the generosity of plan reimbursement below.

Table 1 provides summary statistics for all counties and then separately for each of these three types of counties. For each county, we calculate the annual average of each variable during the 2007 to 2011 period, and then take the (unweighted) average across all counties. Both the fraction of Medicare recipients enrolled in MA plans and the average HHI concentration index are comparable across the three types of counties. However, the composition of MA enrollment is quite different, with PFFS plans relatively more important in low-FFS counties. Additionally, counties

[15] As of 2007, a number of of counties-approximately 7%-no longer have benchmarks determined in the same manner as in 2004. The reasons for this are described in Section 2.2.

with high FFS spending have greater populations on average and , as expected, substantially higher MA benchmarks. The last several rows of the table provide average financial characteristics for MA plans, including plan premiums, rebate payments, and average out-of-pocket costs. For these averages, each plan is weighted by its share of MA enrollment in the county, and each year from 2007 to 2011 receives an equal weight.

4.1 Plan Enrollment Data

We obtain Landscape files from CMS on Medicare Advantage enrollment levels for the combination of the following: county, month, insurer, and the insurance package offered by that insurer (which has the technical term contract). Our final dataset is at the county-year-insurance contract level. For any given year, we exclude contracts with 10 or fewer enrollees, as CMS does not report enrollment for these contracts. In addition, we obtain information on county-year level Medicare enrollment levels, which allows us to calculate Medicare Advantage's share of each county's Medicare population. For counties with 10 or fewer MA enrollees, this number is not reported. Given the small number of counties in our analysis sample missing this data, our empirical results below are not sensitive to whether we exclude these counties from our sample or assume that MA enrollment there is equal to 0.

Across all counties nationwide with MA enrollment exceeding ten, the average number of insurers offering an MA plan is 4.0 and the average HHI concentration index is 5,117. These market measures treat PFFS, HMO, and PPO types of Medicare Advantage similarly. In Table 2, we list the most active insurers in the MA market, based on the number of county-years in which they operate from 2007 through 2011, and also break out each firm's activity by county type as in Table 1. As Table 2 shows, Humana is the most active MA insurer, in terms of county-years in which it is present (comprising nearly 80 percent of all possible markets) and in terms of the number of enrollees it covers.

4.2 Plan Characteristics Data

To measure plan financial characteristics, we draw on plan-year level data from the CMS landscape files for measures of monthly plan premiums and whether each plan provides prescription

drug coverage.[16] To calculate an average for each county in each year, we weight each plan by its share of county-specific MA enrollment in that same year. As shown in Table 1, the average monthly MA plan premium during our study period is approximately $32, while the average fraction of MA enrollees in a county with drug coverage is 69 percent. The table also lists an average monthly plan rebate amount. Beginning in 2006, if an insurer bid below the county benchmark for providing its coverage to an enrollee with an average risk score, it was required to devote 75 percent of the difference to improving consumer benefits in the form of a rebate of added benefits (CHS, 2006). Thus if a plan submitted a bid of $680 per month when a county's benchmark was $720, the monthly rebate would be equal to $30. Plans typically allocate rebates to decreasing the Part B premium paid by consumers, towards reduced cost-sharing, or to supplementary benefits like drug coverage. When the estimated cost of supplementary benefits exceeds the rebate amount, plans can charge consumers an additional premium: there exist many plans that receive rebates, yet simultaneously charge a premium.

We obtain additional data for each plan-year on an MA recipient's total expected out-of-pocket costs as compiled by CMS. These figures are featured as part of the Medicare Compare database that is used by many Medicare recipients, and, therefore, are likely to be salient to consumers. To the extent that a plan provides drug coverage or subsidizes a portion of the Part B premium, it would be captured by this measure (though the plan-specific premium is not included in this measure). In addition to measures of overall expected out-of-pocket costs, this data includes estimated costs for individual components (such as Part B premiums, inpatient hospital costs, and prescription drugs). Further, these data break down expected out-of-pocket costs across different demographics by age as well as self-reported health status. For example, the database provides an expected out-of-pocket cost for a 65-72 year old in excellent health, enrolled in a given insurance contract. We average these estimates across demographic groups to construct a single composite metric. As with the other plan-year measures, variation across counties in this measure is driven by differences in the relative share of each plan in each county.

[16] We also obtain information from CMS on the parent companies operating each specific insurance plan, as well as the type of coverage offered (HMO/HMOPOS, PFFS, or PPO). Following the literature, we consider the plan with the lowest plan ID to be most representative of the insurance contract as a whole (Hall, 2007 and Nosal, 2012). In matching contract enrollments to individual plan characteristics, we match enrollments to the characteristics of the lowest plan ID within the contract.

4.3 Plan Quality Data

For measures of plan quality, we rely on the Consumer Assessment of Healthcare Providers and Systems (CAHPS) survey data, which contains enrollees' ratings of plans, self-assessments of health status, and other measures of plan experience, such as the self-reported number of physician visits. The CAHPS survey is administered yearly, and covers every Medicare Advantage plan that is at least one year old (including HMO, PPO, as well as PFFS plans). As part of the survey, 600 individuals from each MA contract are selected for questioning (if a contract has fewer than 600 enrollees, then all of its enrollees are selected). While 600 are selected for questioning, fewer respond and the average non-response rate is approximately 25%.

Our individual-level data include responses from approximately 160 thousand MA enrollees in each year from 2007 through 2011. This CAHPS data identifies the insurance contract in which each survey respondent is enrolled, along with that respondent's age, race, education, and county of residence. Additionally, the data contains the respondent's answers to each of the survey questions. The first column of Table 7 provides the average measures (on a 0-10 scale) for several quality measures including overall satisfaction with health plan and with primary care physician. As this table shows, MA enrollees are on average quite satisfied with their plans, with especially high ratings for the two physician measures.

4.4 Identification Strategy

To estimate the effect of MA reimbursement on several outcome variables of interest, we make use of the federal policy described above that induces higher reimbursement in urban (metropolitan population of 250,000 and up) than in non-urban counties. For our empirical analyses, we focus mainly on counties in metropolitan areas close to the 250k population threshold so as to have a more comparable set of counties with which to estimate our effects of interest. More specifically, we restrict to counties belonging to metropolitan areas with populations between 100,000 and 600,000. The population range is set larger above the threshold because the density of metropolitan area populations is somewhat thicker in the range below the threshold than above. These criteria yield a sample of 576 counties, with 304 below the population threshold and 272 above. These 576 counties are included in 280 metropolitan areas, with approximately half of the metro areas having

just 1 county, 20 percent having exactly two counties, and the remaining 30 percent having between 3 and 6 counties.

As shown in Figure 1, only those MA plans in counties with relatively low fee-for-service spending would receive the full 10.5 percent reimbursement increase as a result of urban status. Appendix Figure I reveals that the relationship between a county's fee-for-service spending is somewhat noisier in 2007 than in 2004. This continues into subsequent years and reflects the effect of a provision that set a minimum growth rate for the benchmark from one year to the next beginning in 2004. As a result, even if a county saw a substantial decline in its average FFS expenditures from one year to the next, its benchmark would not fall. This explains why many of the data points in Appendix Figure I lie above the payment floors and the 45 degree line.

More than 60 percent of counties have average monthly FFS spending in 2007 less than $662 and would therefore tend to receive the full 10.5 percent increase. We refer to these counties as "group one" counties. Of the 576 counties with metro populations between 100 thousand and 600 thousand, approximately 60 percent (348) are below this expenditure threshold. These 348 counties represent our primary analysis sample.

We exploit variation in the Medicare Advantage benchmark formula that leads urban floor counties to have benchmarks that are approximately 10.5% higher than similar, non-urban floor counties. As shown in Appendix Figure I, both urban and non-urban counties with per-capita FFS expenditures of $662 or less in 2007 typically had benchmarks set at the urban or non-urban floor. In contrast, the payment floor did not bind in counties above $732 in per-capita FFS spending. Urban counties between these two thresholds usually had benchmarks at the urban floor while the non-urban floor was not binding in comparable counties in metropolitan areas with a population of less than 250 thousand. We refer to counties with average 2007 FFS expenditures of $662 to $732 as group two and counties above $732 as group three.

Our key sources of variation is the urban population threshold, which causes benchmarks to be 10.5 percent higher in urban than in non-urban floor counties. To account for the possibility that other factors vary smoothly with population, we control flexibly for both the county population and for the population of the county's metropolitan area. We also include each county's per-capita FFS expenditures. As FFS expenditures increase among floor counties, the gap between the floor and the county benchmarks declines. All else equal, this change would have the opposite effect of

the policy-induced increase in benchmarks at the urban population threshold. But because many other factors - such as patient preferences and provider treatment patterns - are likely to co-vary with per-capita FFS expenditures, we do not assign a causal interpretation to our estimates for the coefficient on this covariate.

We begin by estimating the effect of urban status on the level of benchmarks and then proceed to estimate the effect on market outcomes such as the number of insurers and the HHI concentration index along with measures of plan quality such as plan premiums and enrollee satisfaction with care. While the observation level in our data is at a county-year, our identifying variation stems from each county's associated metro population, and our sample restrictions are also based on metro population. To prevent metro areas with equal populations but a greater number of constituent counties from being mechanically over-represented in our sample, we inverse weight our regressions based on the number of counties making up a given metropolitan area. We control for a county's per-capita level of FFS expenditures and flexibly for both the county and metropolitan area population when estimating specifications of the following type:

$$Y_{jt} = b_0 + b_1 * FFS_{j,2007} + b_2 * Urban_j + f(CountyPop_{j,2007}) + g(MetroPop_{j,2007}) + g_t \qquad (1)$$

In this equation, our coefficient of particular interest is b_2, which represents our estimate of the average impact of urban status on outcome variable Y_{jt}.

One concern with this equation is that there may be other factors associated with urban status - being part of a relatively large metropolitan area - that are not adequately captured by our controls for county and metropolitan area population and fee-for-service expenditures. This concern is to some extent reduced by focusing on a smaller and more comparable set of counties that are close to the 250 thousand threshold. To probe the robustness of our results, we estimate additional specifications that vary the range of the population window that is included in our analysis sample and also vary our method of controlling for county and metropolitan population. We also investigate graphically how our outcome variables evolve on either side of the threshold.

Even with these robustness checks, one might be concerned that other factors correlated with urban status are biasing our estimates. First, we consider whether other county characteristics, unrelated to MA policy, might differ across the 250 thousand threshold. Undertaking a

balance test, we show in Table A.1 that demographic and other county characteristics are stable around the population threshold, at the same time that MA benchmarks and MA market share differ substantially. To further address this issue, we estimate a companion set of specifications for counties with high average fee-for-service spending. As shown in Figure 1, urban status does not appreciably affect county benchmarks for these areas, and these specifications therefore serve as a useful falsification test. Additionally, we estimate specifications for some outcome variables before the reimbursement increases for urban areas were introduced in 2001. To the extent that the relationships are similar in that earlier period, it would suggest that the additional plan reimbursement has little impact.

One final concern could be the indirect manner through which county benchmarks affect plan reimbursement; plans submit bids for how much it would cost to provide traditional Medicare services, for an average enrollee, with the county benchmark serving as an important reference point. Plans can bid up to the county benchmark. However, plans have some incentive to bid below the benchmark, as they can then allocate 75 percent of the difference between the bid and benchmark towards additional services, which could help attract additional enrollees. In Table 11, we show that a $1 increase in the county benchmark in urban relative to non-urban counties is accompanied by a $0.93 average increase in plan bids. Given this, we argue that county benchmark increases are transmitted almost fully to insurers, even in the presence of this bidding mechanism. As such, we can abstract away from this bidding structure, for the remainder of our analyses.

To sum up, we exploit three primary sources of variation in the analyses that follow. First, we compare urban and non-urban "floor" counties to estimate the effect of the policy-induced increase of 10.5 percent in MA county benchmarks. Second, we explore whether our estimates for urban status are similar in high FFS counties in which urban counties do not receive additional reimbursement. And finally, we explore the relationship between urban status and our outcome variables of interest in our analysis sample before the urban increase was introduced in 2001. These multiple approaches allow us to obtain a credible estimate of the impact of policy-induced reimbursement changes on several outcome variables of interest in this rapidly growing area of the health care sector.

5 Results

5.1 The Impact on County Plan Benchmarks

To investigate the effect of urban status on county benchmarks and on other outcome variables of interest, we primarily focus on the 2007 through 2011 period. We do this because Medicare Advantage changed substantially in 2006 with the introduction of Medicare Part D (and our results are quite similar if we include 2006 as well). For the reasons outlined in the preceding section, our analysis sample includes counties in metropolitan areas with populations between 100 and 600 thousand, though we test the sensitivity of our results to alternative sample definitions.

The first column of Table 3 summarizes the results of a specification for "group one" counties - those with average FFS expenditures below $662 in 2007.[17] As discussed above, the effect of urban status should be largest for these counties. The specification also controls (with a linear and quadratic term) for both the county population and the metropolitan area population along with monthly FFS expenditures. Standard errors are clustered at the metropolitan area level given the level of variation of the URBAN indicator. The point estimate of 71.46 for the URBAN coefficient is very precisely estimated and suggests an increase of more than 10 percent in the average monthly MA benchmark. None of the four coefficients on the population variables are statistically significant. The estimate for the FFS expenditure coefficient is statistically significant though the magnitude of the estimate (0.04) is small. The positive point estimate reflects the fact that counties with spending close to $662 are more likely to rise above this floor in 2008 and later years.

The next column repeats this specification though focuses on "group two" counties - those with average 2007 FFS expenditures between $662 and $732. The statistically significant point estimate of 22.72 for our key explanatory variable indicates that urban counties in this intermediate range of per-capita FFS spending did experience an increase in their monthly benchmarks relative to their non-urban counterparts. Not surprisingly given the noisy relationship between benchmarks and FFS spending in this range displayed in Appendix Figure I, this coefficient estimate is less precise, with a standard error that is approximately five times larger than for group one counties.

[17] By using the 2007 floor definitions, we guarantee a balanced panel. If we used the contemporaneous payment rate to define the sample, we would lose 25 counties in 2009 and 2010.

The analysis sample for the third specification in Table 3 includes counties with per-capita FFS expenditures above $732 per month. For these counties, urban status should not lead to an increase in monthly benchmarks, as payment floors do not bind for either type of county. Consistent with this, the coefficient estimate is actually negative though is even less precisely estimated than for group two counties. When we pool together group 2 and group 3 counties in the final specification, we find little evidence of an increase in monthly benchmarks resulting from urban status. Taken together, the results in this table strongly suggest that relatively low FFS counties in urban areas experience a large policy-induced increase in monthly MA benchmarks while high FFS counties do not.

The urban payment floor for MA plans, which is 10.5 percent higher than the non-urban payment floor, was introduced in 2001. To the extent that our estimates are capturing a causal effect of this policy, we should detect little relationship between urban status and monthly MA benchmarks in the preceding years. To investigate this issue, we estimate a specification analogous to the first one in Table 3 for the 1998 through 2000 period with the same sample of group one counties. The results from this specification are summarized in the first column of Table 4. The point estimate of -4.97 is insignificant and precisely estimated.

We next estimate this same specification using data from the 2001 through 2003 period, the period just following the increase in MA reimbursement, with the results summarized in the third column of Table 4. The point estimate for b_2 of 24.76 is precisely estimated though is considerably smaller than the corresponding one estimated for the 2007 through 2011 period. This is primarily because CMS categorized counties somewhat differently during this period, so that many counties with an urban designation after 2003 did not have an urban designation previously. In specification 4 we account for this by adding an indicator variable with the pre-2004 definition. The point estimate for the coefficient on this second indicator variable is approximately twice as large at 48.88. Figure 9 describes the evolution of the urban dummy on benchmarks over time. Before 2001, the urban dummy has no effect. Between 2001 and 2003, the urban dummy has a smaller effect. In 2004, both the urban and rural floors were increased, leading to a higher proportion of our sample being classified as a floor county. Furthermore, it may take time for firms to submit new bids and consumers to react to changes in reimbursement. As seen in Figure 10, we only see large effects of the urban dummy on enrollment in 2006 and beyond.

While we do not have enough counties near the urban threshold to employ all of the techniques of a standard regression discontinuity design, Figure 6 presents a graphical illustration of the monthly change in benchmarks for group one counties using a uniform kernel and the optimal bandwidth of Imbens and Kalaynaraman (2012). The figure shows a clear discontinuity in payment rates at the urban threshold. Additional figures highlighting the other variables of interest are available in the appendix.

Taken together, the results presented in this section demonstrate that urban counties with relatively low FFS spending had significantly higher MA benchmarks than did comparable non-urban counties. We find no similar relationship for counties with high FFS spending, in which the payment floors rarely bind. Additionally, our results using data from an earlier period (and the year-by-year estimates shown in Figure 8) reveal that this relationship did not exist before 2001 and emerged immediately after urban floors were introduced in that year. In a companion set of specifications, we find that these results are very similar if we choose a narrower bandwidth for our analysis sample and if we control more flexibly for county and metro population. As a further robustness check, in Table A.1 we explore whether the Medicare population in counties above the 250k population threshold are similar to their counterparts in counties below. With respect to demographic characteristics, average income, and average fee-for-service expenditures, the two sets of counties are very similar. In the subsequent sections, we explore how this policy-induced increase in the generosity of plan reimbursement affects market outcomes and the quality of MA coverage.

5.2 Market Structure and MA Enrollment

We next explore the effect of the policy-induced increase in MA plan reimbursement on two measures of market structure - the number of insurers and the HHI concentration index. As our model above suggests, increases in the generosity of reimbursement may cause additional firms to enter the MA market and incumbent firms to increase the quality of their product in response. Here, we consider counties in the first group described above, with FFS expenditures per enrollee below $662 in 2007. For this group of counties, the average number of insurers offering an MA plan during the 2007 through 2011 period was 6.5 and the average HHI concentration index 3,907 (measured on a 10,000 scale). We once again control for both county population and metropolitan area population (with both a linear and quadratic term) and for average per-capita FFS expenditures in 2007.

The first specification summarized in the first panel of Table 5 considers the effect of urban status on the number of insurers. The point estimate of 1.78 for the urban indicator variable represents more than 25 percent of a county's mean number of insurers for our analysis sample. This estimate is highly significant with a t-statistic of 3.8. The significantly negative point estimate of -.69 for the per-capita FFS expenditures variable suggests that fewer insurers enter as a county's fee-for-service expenditures gets closer to the $662 monthly FFS spending upper bound for group one counties. This makes sense as the gap between the plan reimbursement and FFS expenditures is declining in that measure (as shown in Figure 1), though we emphasize that other factors may vary with per-capita FFS expenditures and thus stop short of a causal interpretation for this estimate. Appendix Table A.7 presents the other coefficient estimates from this specification and reveals that there is a strong relationship of the number of insurers with the county population.

The second specification yields a similar picture by considering the effect of urban status on the HHI concentration index. Counties in metropolitan areas above the urban threshold are significantly less concentrated, with the point estimate of -873 representing almost one-fourth the mean HHI in our analysis sample. The HHI increases as FFS spending rises and thus the gap between this and the payment floor declines. As expected, the point estimates in column 2 have the opposite sign to those for the previous specification given that here a larger number represents fewer insurers operating. Our HHI measures are the least robust across specifications. This is not surprising, as HHI is a highly non-linear measure and the effect of additional entrants is not necessarily large. We find that the urban dummy does not have a large effect on the % of plans sold by the three largest insurers in a market. Therefore, our results suggest that higher reimbursement lead additional fringe insurers to enter, but not capture large market shares.

Columns 1 and 2 in the first panel of Table 5 suggest that the additional reimbursement available to plans in counties with the urban designation leads to more entry and a reduction in concentration. The next three columns identify whether and to what extent the additional reimbursement leads to more MA enrollment. The third column shows that the fraction of Medicare recipients enrolled in Medicare Advantage HMO or PPO plans increases by 7.1 percentage points as a result of the greater reimbursement, while column 4 shows a corresponding increase of 5.9 percentage points in the share enrolled in MA private fee-for-service plans. Both estimates are substantial relative to the sample means for our analysis sample. Figure 7 presents a graphical

illustration of the effect of the urban threshold on MA penetration. MA penetration averages 10 percent immediately to the left of the threshold and 20 percent immediately to the right, providing additional evidence of a causal effect.

In subsequent panels of Table 5, we test the robustness of these results in a number of ways. The second and third panels use narrower population bandwidths when constructing the analysis sample. The advantage of the wide bandwidth that we use in the preceding specifications (100,000-600,000) is that roughly one-fourth of Medicare eligibles are in metropolitan areas in this population range. The disadvantage is that by including such a broad population range, we may introduce bias. The specifications summarized in the second panel include only counties in metropolitan areas with populations from 150 thousand to 350 thousand. All of our results are qualitatively similar (though the estimate in the HHI specification is no longer statistically significant) and suggest that the policy-induced increase in reimbursement leads to substantially more entry and an increase in MA enrollment in urban counties. Our results are also robust to alternative methods of controlling for population as evidenced in A.2.

In the fourth panel of Table 5, we summarize the results from the same set of specifications for high FFS spending counties where, as we showed in Table 3, urban status was not associated with a significant increase in monthly benchmarks. In contrast to our results in the preceding panels, here we find no significant relationship between urban designation and the number of insurers or MA enrollment, though our estimates for this sample are somewhat less precise. Similarly in the fifth and final panel, we display the results from specifications for the period before the additional funding for MA plans in urban counties was introduced. Once again, we find no relationship between urban status and our measures of market structure or MA penetration.

Taken together, the results in this table demonstrate that the policy-induced increase in reimbursement for private Medicare Advantage plans has a significant effect on market structure and on the share of Medicare recipients enrolling in MA plans. This provides evidence of a potential market power effect of higher reimbursement, even insurers are not price takers.

5.3 Financial Characteristics of Plans

We next consider how the financial generosity of MA coverage varies with the additional policy-induced reimbursement. As discussed in our theoretical framework above, insurers may respond to

the higher benchmarks in urban counties and to the resulting increase in competition by reducing their premiums or out-of-pocket costs or by offering additional services. To test this possibility, we begin by exploring the relationship between urban status and the monthly MA plan premium, which has an average value of approximately $30 in our analysis sample. This premium data is available at the county-plan-year level, and our county-year measures are enrollment weighted-averages. As shown in the first column of the first panel of Table 6, the point estimate for the urban indicator is very small in magnitude (-1.00) and statistically insignificant. This suggests that despite the substantially higher benchmarks in urban counties, MA enrollees do not benefit in the form of much lower premiums.

In the second column we consider the effect on the amounts that insurers allocate toward supplemental Medicare services through the rebates they are provided by CMS (if and when their bids fall below the benchmarks). We only have rebate data for 2007 through 2010, and so our analysis sample is 20 percent smaller as a result, and the average value of this variable for our analysis sample is $54 per month. Consistent with our estimate for the premium measure, our results provide little evidence to suggest that significantly greater plan reimbursement leads to substantial additional benefits to enrollees. The point estimate of 3.52 for the benchmark represents about 5 percent of the additional reimbursement and we can rule out an increase in the rebate of more than $14 (less than one-fifth of the additional reimbursement) at the 95 percent level of confidence.

In the third column, we investigate the effect on out-of-pocket costs (OOPC). To the extent that an insurer responds to the additional reimbursement by, for example, reducing deductibles or offering supplemental services such as vision coverage, it would be reflected in this measure. This measure weights by MA enrollment, and the average OOPC in our analysis sample is approximately $383 per month. The point estimate of -7.33 for the urban coefficient is statistically insignificant. With this point estimate, we can rule out an out-of-pocket cost reduction of more than $25 per month (about 35 percent of the benchmark increase) at the 95 percent level of confidence.[18]

In the fourth column, the outcome variable is a measure of total expected costs for the enrollee, based on the sum of premiums and out-of-pocket costs indicators. Rebates are not in-

[18] The statistically significant negative estimate for the FFS variable in the OOPC specification suggests that, as the wedge between the floor and FFS spending grows, plans become less generous. However, as we emphasize above, other factors likely vary with FFS expenditures, and thus we do not assign a causal interpretation to this estimate.

cluded in this measure to avoid double counting (rebates that are allocated to lower cost-sharing or plan premiums or to additional services would be captured by this measure). The statistically insignificant point estimate of -8.33 suggests only about one-eighth of the additional reimbursement is passed on to consumers and we can rule out a benefit of more than $30 (45 percent of the benchmark effect) at the 95 percent level of confidence.

In the fifth column, we consider the provision of drug coverage and - consistent with the previous measures - find little evidence that this benefit is more likely to be offered by plans in urban counties, as the point estimate on the urban indicator is actually negative. And as with the OOPC variable, Part D coverage seems if anything to be less generous in counties with lower FFS reimbursement, where more insurers enter. This could once again reflect marginal entrants being less generous than incumbent firms on this dimension.

For all five of the outcome variables considered here, we weight by each plan's share of county-specific MA enrollment in the year. If MA recipients in urban counties were, for example, less likely to choose low-premium plans or plans with generous cost sharing, our estimates could provide a misleading estimate of average plan quality. To investigate this possibility, we estimate a companion set of specifications in which we weight each plan in a county-year with non-zero MA enrollment equally. As shown in Appendix Table A.10, our point estimates for the urban indicator are qualitatively quite similar and also suggest limited pass-through.[19]

We probe the robustness of these results in a number of ways. For example, in the next two panels we investigate whether the results are similar for narrower bandwidths than in our main analysis sample. While the point estimates become less precise, they remain small in magnitude. For example, the insignificant point estimate of 4.14 for the sum of plan premiums and other OOPC in the fourth column actually suggests plans in urban counties offer somewhat less generous coverage, and we can rule out pass through of more than $25 (about one-third of the total effect on benchmarks) at the 95 percent level of confidence. And our estimates in the fourth and fifth panels, which represent falsification tests for high FFS spending counties and in the pre-period, respectively, further support our findings, though we do not have data on all of the outcome variables of interest

[19] Interestingly, the point estimates for the coefficient on FFS expenditures in the OOPC specifications change sign in these unweighted specifications, and now indicate that as the wedge between the floor and FFS spending declines, plans become less generous. This suggests that MA recipients in areas with higher FFS spending are more likely to choose plans with generous cost-sharing. As with the other point estimates for this FFS variable, we do not assign a causal interpretation.

in the pre-2001 period.

Our main results provide evidence of a causal relationship between benchmarks, MA penetration, and market structure. However, the results suggest that benchmarks have little impact on the financial features of plans. Though we lack a sufficient number of observations to implement a crisp regression discontinuity design, we present a number of additional specifications in the appendix that test the sensitivity of our results. The combination of falsification and robustness exercises affirms that our main results represent the causal impact of the benchmark on market structure and financial features of MA plans. But the possibility of course remains that MA plans are improving quality on other dimensions not captured by these financial variables, such as the quality or breadth of provider networks, which motivates the analyses in the next section.

5.4 Quality Characteristics

Higher MA reimbursements could also be passed on to consumers in the form of quality improvements. To identify possible changes to the quality of health care coverage (as distinct from the financial measures considered above), we use respondent-level survey data from the federal government's Consumer Assessment of Healthcare Providers and Systems for the 2007 through 2011 period. These data contain information on respondents' counties of residence, allowing us to examine the relationship between county-level reimbursement variation and the measures included in the CAHPS. The full CAHPS sample includes approximately 160 thousand respondents each year and we have nearly 82 thousand person-year level observations for the counties in our analysis sample during our study period.

We examine the impact of additional plan reimbursement on respondents' overall ratings of plan quality along different dimensions: health care received, the primary care provider, specialists seen, and the plan overall. We run our results on data aggregated to a county-year level, while restricting to counties in the 100-600k metro population range, with 2007 FFS values below the $662 monthly amount described above. The main results are displayed in Table 8. We find no significant relationship between a county's urban status and each of these rating measures. Using the approach introduced in Kling et. al. (2007), we calculate standardized treatment effects, to examine whether urban status has an impact on these ratings measures, as a collective. These results also indicate no significant relationships between higher MA benchmarks and plan ratings.

We further examine the effect on plan quality by looking to plan-level quality measures ("star ratings") compiled by CMS, relating to health outcomes, chronic care management, customer service, and the plan overall. These results, displayed in Table A.6, also show no significant relationship between a county's urban status and various metrics of plan quality. We can rule out a percentage increase in consumer's rating of "Overall Health Plan" of greater than 3.1 percent at a 95 percent level of confidence.

We also consider the impact on measures of utilization and outcomes contained in the CAHPS, such as number of specialist visits, number of personal MD visits, and self-reported health status. To the extent that additional reimbursement leads plans to expand access to care or to improve enrollee health more, it would potentially be captured by these estimates. These results, which are presented in Table 9, provide no evidence of a significant relationship between urban status and utilization or health outcomes across the counties in our analysis sample. These results - and those presented in Table 8 - are robust to use of a narrower population bandwidth (150 to 350k) as shown in Tables A.8 and A.9.

It is worth noting that these results on quality and intensity of care could be biased if the increase in MA enrollment that we find in urban counties leads to a significant change in the composition of enrollees. If, for example, MA plans in urban counties had patients who were substantially sicker (or healthier) on average, then we might estimate a significant difference even in the absence of a difference in plan characteristics. This motivates our analyses in the next section.

5.5 Compositional Effects

We do not find evidence of increased reimbursements being passed through to consumers to a significant extent in the form of lower cost-sharing or increased quality. However, our results could be biased by reimbursement-driven changes to enrollee composition within Medicare Advantage. As we showed in Table 5, the 10.5 percent increase in benchmarks for floor counties resulting from urban status leads to a substantial increase in MA enrollment. As such, we test for possible compositional changes to MA enrollment, which could accompany these increases to enrollment.

Using data from the CAHPS, we once again restrict to counties in the 100-600k metro population range, and with average per-capita FFS expenditures in 2007 of less than $662. We then compile demographic and health metrics for enrollees in urban and non-urban counties, respectively.

As shown in Table 10, we do not find substantial differences in age, gender, race, or in other utilization measures across enrollees in these counties. This does not definitively rule out the possibility of unobserved differences between the marginal and average MA enrollee. But we find very little evidence that compositional differences could be driving the very large difference between our results for a substantial effect on plan reimbursement and very little effect on the measured quality of MA coverage. In Table A.6, we consider additional metrics - the average risk score of MA enrollees (which is increasing with the number of conditions that a Medicare recipient has) and the average costs of those remaining in FFS - to test for possible reimbursement-driven changes to enrollee composition. These results also do not provide any evidence of significant changes in enrollee composition as a result of increased reimbursement. Finally, Table 11 presents the results of a regression with bids as a fraction of the benchmark, rather than prices or measures of quality, as the outcome of interest. The urban dummy has no effect on this measure, indicating that bids average 90 percent of benchmarks in both rural and urban floor counties. This suggests that firms are attuned to benchmarks, especially in floor counties, and bid to maximize payments.

5.6 Advertising and Firm Returns

Our empirical results show that larger subsidies to Medicare Advantage plans lead to significantly more insurers operating and to less concentrated insurance markets. Furthermore, more generous subsidies lead to higher Medicare Advantage penetration rates. Given these two facts, it would be natural to assume that the higher subsidies are passed on to consumers in the form of lower premiums, out-of-pocket costs, or higher quality. Our empirical results do not support this conclusion. Given low pass-through of benchmarks to consumers and limited evidence of meaningful selection on the margin, we argue that perfect competition is a poor benchmark for this market. While higher margins seem to stimulate competition, competition has a limited effect on the price and quality of MA plans.

Yet imperfectly competitive firms must also compete for consumers. The increase in the number of plans sold indicates that something must induce higher participation rates. We therefore explore whether strategic advertising may drive enrollments. In order to calculate the impact of benchmarks on marketing, we utilize data on TV spot advertising from Kantar Ad$pender. Kantar tracks spending at the insurer line of business-DMA level. We restrict our analysis to Medicare

products. This includes not only Medicare Advantage plans, but also Part D and Medicare supplement plans as well. Unfortunately, the Kantar data does not allow us to distinguish between these products and data will be an overestimate of the amount of advertising for MA plans. However, we have no reason to believe that advertising for Medicare supplement or Part D plans would vary with floor status. Average spending per Medicare enrollee is $5.90 per year.

We aggregrate spending to the DMA level; there are 210 DMAs and we observe four years of data, giving us 840 total observations. Here we include all counties because the DMA boundaries do not line up neatly with the county and MSA boundaries in our analysis sample. The outcome of interest is advertising spending per Medicare enrollee in a DMA. We regress this variable on a number explanatory variables, including the share of Medicare beneficiaries within the DMA located in urban floor counties ("% urban floor") and FFS spending.

Table 12 presents the results. In the first specification, we regress spending per enrollee on the share of beneficiaries in urban floor counties, year fixed effects, population, and population squared. The relationship is positive and statistically significant, indicating that firms would spend more per beneficiary in a DMA composed completely of beneficiaries in urban floor counties. However, benchmarks are likely to be correlated with FFS costs. The second specification regressed spending per enrollee on FFS costs; the coefficient is negative and significant, indicating that firms advertise less in areas with expensive enrollees (Aizawa and Kim, 2013 show that advertising may drive advantageous selection). The third specification controls for an index of advertising prices and percentage of beneficiaries in urban floor counties. In this specification, we again see a strong positive relationship between benchmarks and advertising: firms advertise more in counties with higher plan reimbursement. The results are similar in the fourth specification, which controls for county-specific FFS costs.[20] The second panel repeats the exercise, controlling for the percentage of Medicare beneficiaries within a DMA in rural floor counties. Here, the coefficients are generally positive, but statistically insignificant, consistent with smaller incentives for marketing in these counties. The most conservative estimates, in the final column of the second column, indicate $4.41 more spending per enrollee in a DMA composed only of urban floor counties than in a DMA composed of only rural non-floor counties.

[20] We use the primetime SQAD points (and SQAD points squared) as our measure of advertising costs. See https://www.lib.umn.edu/faq/6521 for more information.

Our results indicate that higher benchmarks are associated with higher levels of advertising. The effects are large in magnitude, implying that firms spend nearly twice as much marketing to urban floor enrollees than the rural, non-floor counterparts. We believe these results can rationalize much of the expansion of MA plans in urban counties. Much of the additional advertising can be attributed to spending by large firms with a presence in most markets, rather than marginal entrants.[21] This additional spending can help justify the strong relationship between the urban dummy and MA penetration rates. Furthermore, these results provide evidence that increased benchmarks need not accrue to insurers, but may flow to other players in the supply chain. Other work has shown a similar pattern, with rents accruing to insurance agents and brokers (Starc, 2014).

Despite dissipation of some rents through marketing costs, it is plausible that insurers also capture part of the increased benchmarks. Figure 2 shows dramatic increases in stock prices for the four publicly traded health insurers with the most MA enrollment (Humana, United, Cigna, and Aetna) as a result of a surprisingly large increase in benchmarks on April 1, 2013. Interestingly, it is Humana, the most active insurer in the Medicare Advantage market from Table 2, with the biggest increase. A simple pre-post comparison of market capitalization for these four firms, which accounted for about 44 percent of MA enrollment at the time of the policy change, indicates a market capitalization increase of approximately $2.7 billion. The announced benchmarks represented an increase of approximately 5.6 percent relative to what otherwise was specified by legislation. Multiplying this percentage by our estimate of baseline MA revenues for each insurer (calculated by multiplying enrollment weighted benchmarks for each insurer by the average risk score of its enrollees) yields an estimated increase in annual MA revenue of about $2.9 billion.

It is important to note that investors apparently did expect a significant increase in benchmarks around this time. For example, according to Humana's press release, the firm had expected a 4.4 percent increase in benchmarks instead of 5.6 percent. If one assumes that this also accurately captures the assumptions of investors, this would suggest that just $0.62 billion of the $2.9 billion increase in annual MA revenues was a surprise. Using a discount rate of 5 percent, this

[21] Humana's spending increases by just over $1 per Medicare enrollee per year with each $100 increase in the monthly benchmark. Assuming a 20% Medicare Advantage enrollment rate, this implies that firms are spending $17.50 per additional enrollee per year in urban floor counties relative to rural floor counties with the same level of FFS spending.

implies an increase in the present value of MA revenues of approximately $12.4 billion. Combining our estimate of a $2.7 billion increase in market capitalization with the $12.4 billion increase in the present value of MA revenues, we estimate that 22 percent of the increase in benchmarks is passed through to insurers in the form of higher profits. Of course, the precision of this estimate is necessarily more speculative than our estimates relating to consumers. But the sharp reaction of health insurer stock prices to changes in the level of MA reimbursement strongly suggests that insurers capture much of the benefit of policy-induced increases in plan reimbursement.[22]

Our estimates and back of the envelope calculations indicate that, at most 45 percent of the increased reimbursement goes to consumers and approximately 22 percent goes to insurers. Our advertising results suggest that some of the increased expenditure is dissipated through marketing costs. Theory suggests that hospitals, physicians, and other health care providers could also capture some of the increased reimbursements, by virtue of market power. However, the aforementioned calculations leave relatively little for providers. The absence of stock price reaction from the largest publicly-owned hospital operator, HCA, on April 1, 2013, is also suggestive of limited benefits to providers. Altogether, increased financial generosity, increased insurer profits, and increased marketing account for nearly all of the increased government expenditures.

While we argue that market power rationalizes our empirical results, we do not discuss the potential sources of that market power. Previous work on Medigap (Starc, 2014) has emphasized the importance of brand preferences and marketing. In the Medicare Advantage market, various behavioral biases including inertia (Nosal, 2012) and price salience (McGuire and Newhouse, 2014 and Stockley et. al., 2014), have been suggested and explored. Figure 9 shows the effect of the urban dummy on benchmarks by year, and Figure 10 shows the effect of the urban dummy on MA penetration rates by year. While we cannot rule out that the effect is statistically the same from 2006-2010, it does appear to be trending upwards over time, consistent with behavioral biases including inertia. These models have different implications for policy makers, and distinguishing

[22] The benchmark increase of 5.6% applied not only to 2014 benchmarks, but also to all future year benchmarks; for 2014, this resulted in a benchmark that was 1.2% higher than the expectation. In our calculations, we thereby assume that all future year benchmarks would also be 1.2% higher than expected. However, for some of these years, higher benchmarks may have already been anticipated; congressional action on Medicare SGR policies would produce a benchmark increase of commensurate magnitude and would supercede CMS's action. While CMS preempted such legislation through its unilateral action, following any Congressional legislation, past CMS action (or lack thereof) would not affect subsequent benchmarks. In our calculations, we do not account for this possibility. As such, our estimate of the unexpected revenue increase, from CMS's action, represents an upper-bound, meaning that our estimated pass-through rate to insurers represents a lower-bound.

between them is an important avenue for future research.

6 Conclusion

Our results strongly suggest that increased subsidies for private insurance in the Medicare market result in increased insurer advertising, but little additional monetary or medical benefit for consumers.[23] Low pass-through cannot be attributed to selection and is, more likely, a result of market power. Altogether, the results indicate that incidence of the subsidy falls primarily on the supply side of the market. This finding is further supported by insurer stock price movements throughout the passage and implementation of the Affordable Care Act.

While we find no direct evidence that benchmarks meaningfully benefit consumers, such benefits could exist. Additional choice, due to insurer entry, could lead to meaningful gains in consumer welfare through better matching. Given that MA penetration rates increase alongside reimbursements, a revealed preference argument would imply that MA is more valuable to consumers when the benchmark is higher. The impact on consumer surplus may also depend on the welfare consequences of advertising. Furthermore, higher benchmarks may improve treatment quality and health outcomes in ways that we are unable to measure. Finally, our analysis focuses on low FFS counties and may not be applicable to the one-third of counties with FFS spending significantly higher than the floor thresholds. All of this notwithstanding, the measures of plan financial characteristics and quality that we use suggest that only about one-sixth of the policy-induced increase in plan reimbursement is captured by consumers.

While reimbursement increases have an ambiguous welfare impact on consumers, they unambiguously increase costs, through increased numbers of MA enrollees and through increased government spending per MA enrollee. A back-of-the-envelope estimate suggests that this additional spending amounted to approximately $6.7 billion during the final year of our sample period.[24]

[23] The advertising is clearly market expanding if Medicare Advantage is the relevant market. However, the extent to which this is welfare enhancing depends on the view of advertising. We simply highlight that insurers in this market, as well as other insurance markets (Starc, 2014), tend to compete on advertising, rather than plan generosity or innovative benefit packages.

[24] Approximately 5.0 million MA enrollees resided in floor counties in 2011. In non-floor counties, the benchmark is on average 6.1 percent higher than the lagged 5-year average FFS expenditure measure. If this same 6.1 percent ratio existed in floor counties, monthly (annual) benchmarks would be $63.09 ($757.08) lower and spending for the 5.0 million MA enrollees would be $3.8 billion lower. Additionally, our estimates for the effect of benchmarks on MA enrollment suggest the benchmark increase leads to about a 13 percentage point increase in MA enrollment. With 20.1 million Medicare recipients in floor counties, this represents about 2.6 million additional MA recipients. Recent

Therefore, policy-makers should carefully weigh the possible gains in consumer welfare against the costs to the federal government, and future work should attempt to quantify the full welfare benefit of increased reimbursements.

research (Brown et al, 2014) indicates that switching into MA increases Medicare spending by more than $1,200 per recipient because of favorable selection and this suggests about $2.9 billion more in Medicare spending.

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8 Tables and Figures

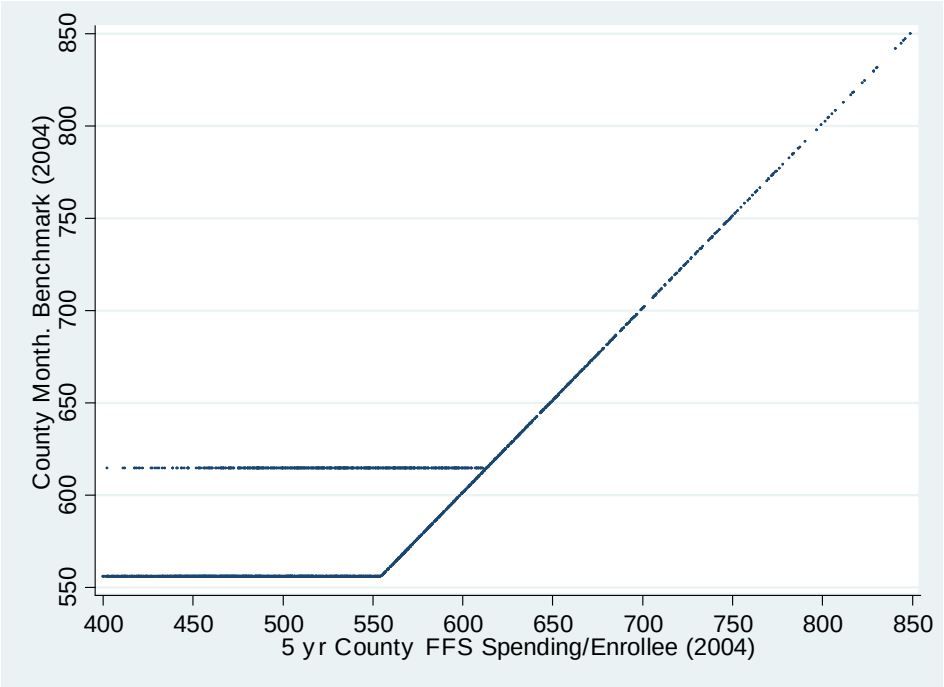


Figure 1: County Benchmarks and FFS Costs in 2004

[24] For fewer than 10% of counties, 2007 county benchmarks do not correspond to either a floor (two horizontal lines) or to a county's 5-yr FFS spending/enrollee (primary diagonal). This is due to ideosyncrasies in how county benchmarks were determined following 2004 (see CHS, 2006). For benchmarks as of 2007, see Appendix Figure 1.

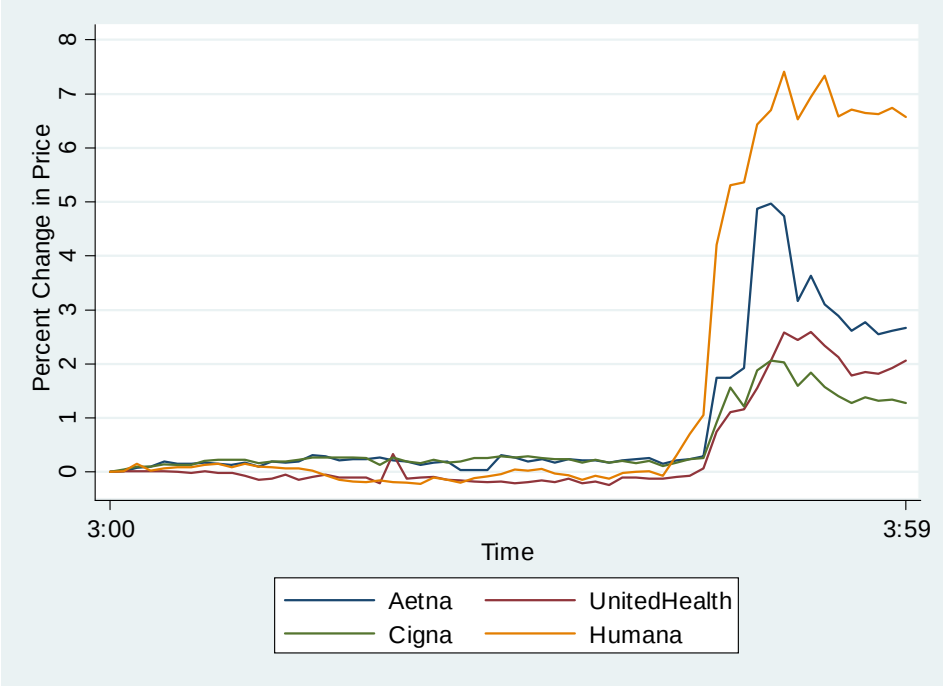


Figure 2: Stock Returns of Major MA Insurers, 3-4 pm on April 1, 2013

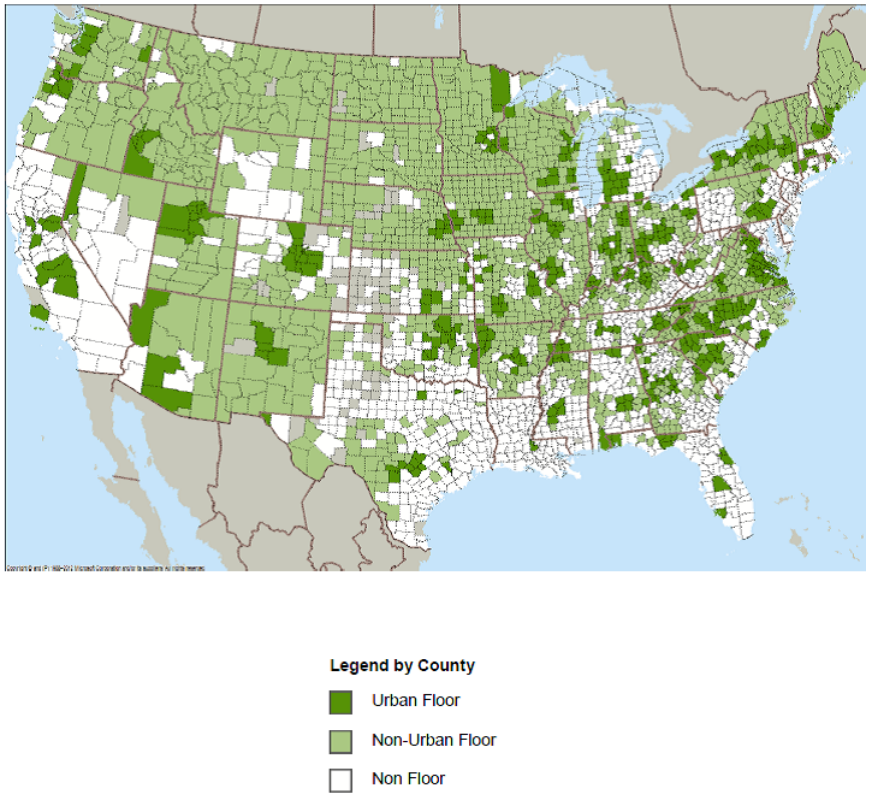


Figure 3: Nationwide Distribution of Floor Counties

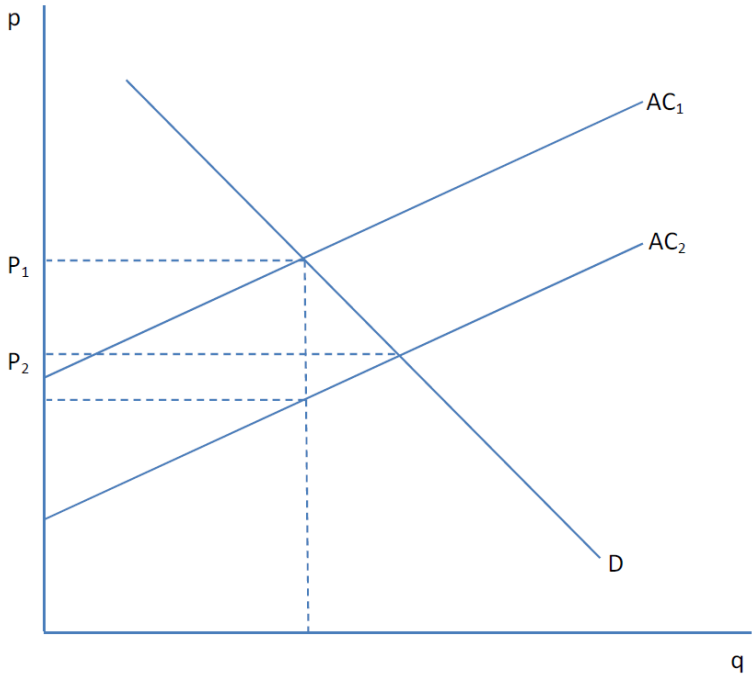


Figure 4: Pass-Through Under Advantageous Selection

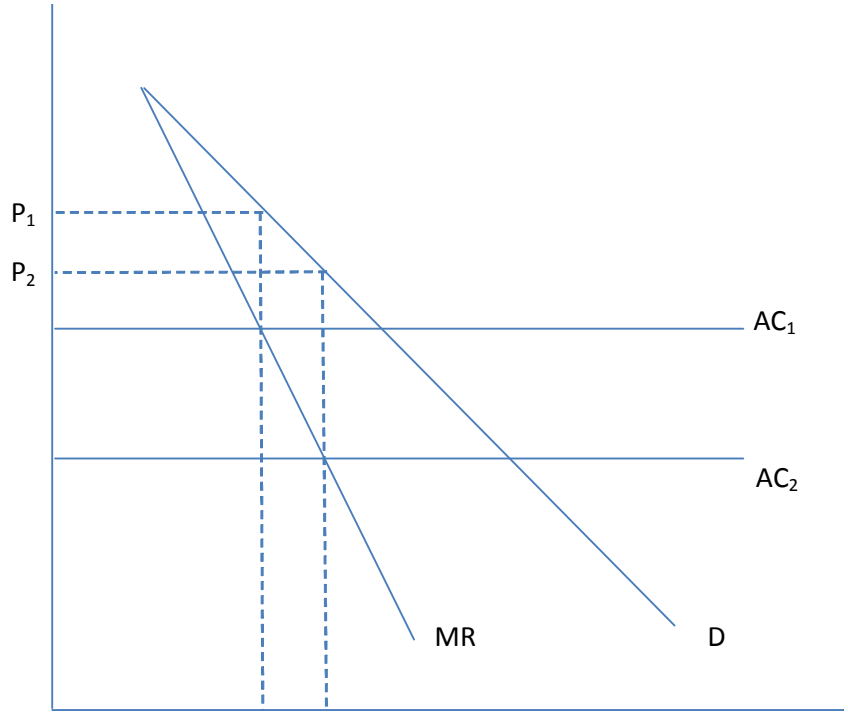


Figure 5: Pass-Through Under Constant Average Cost and Monopoly

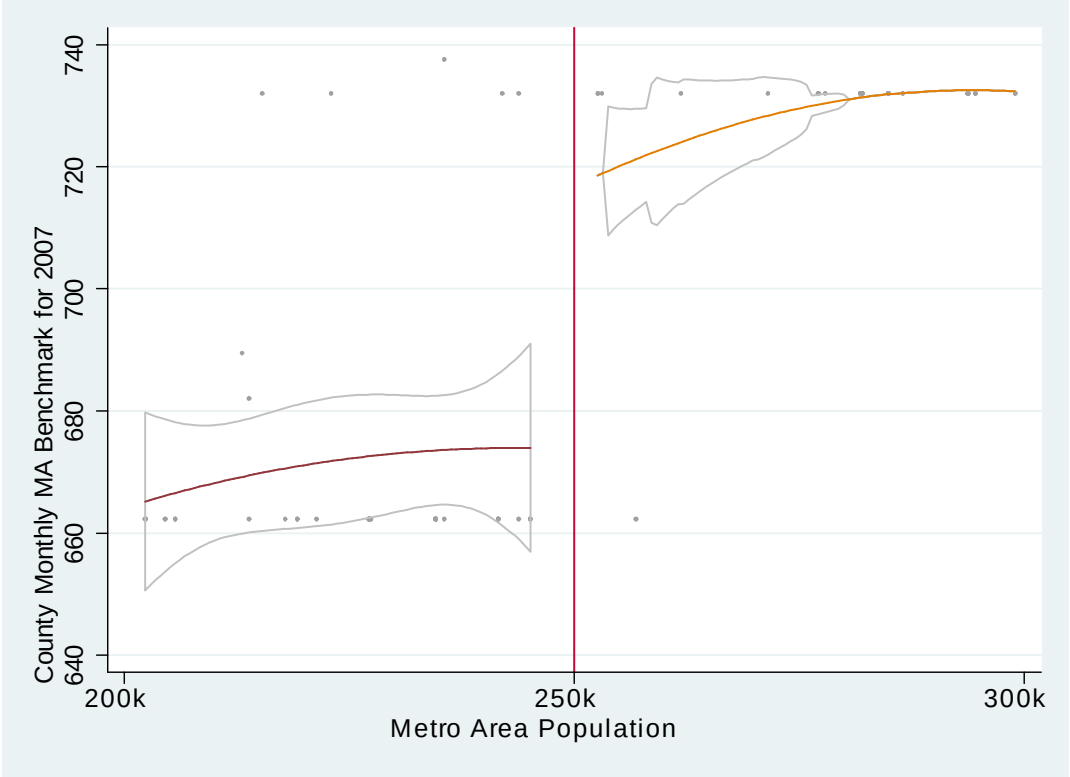


Figure 6: Monthly Benchmark Change at Population Discontinuity

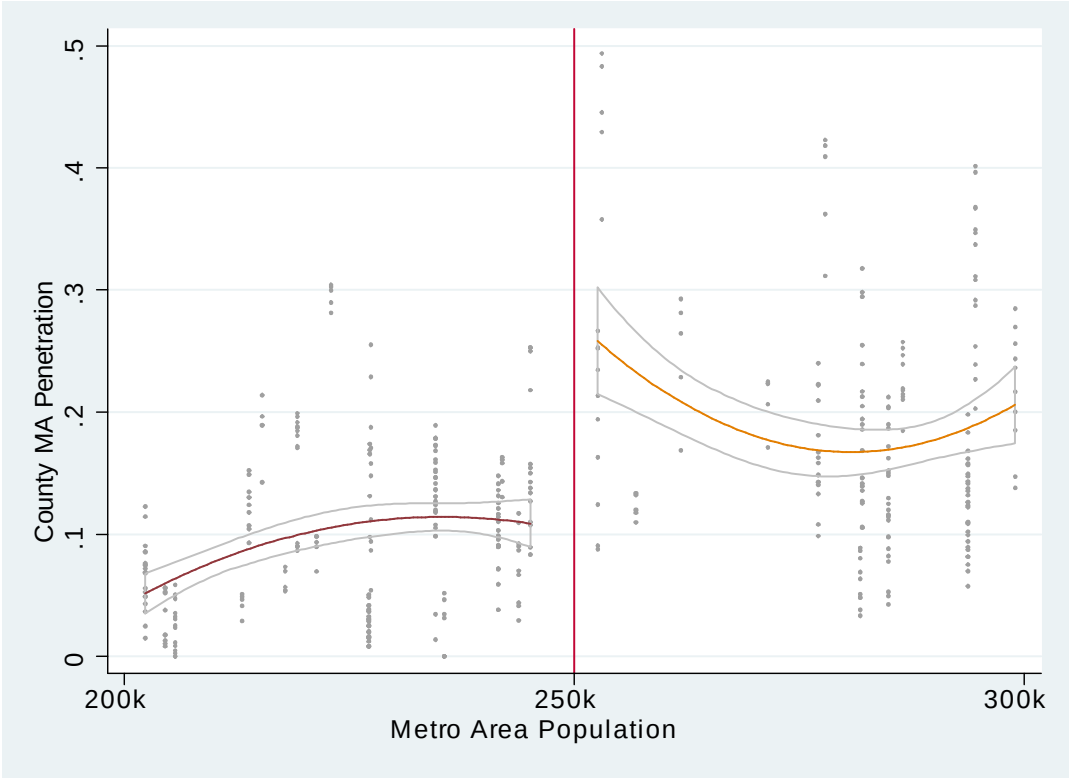


Figure 7: MA Penetration Change at Population Discontinuity

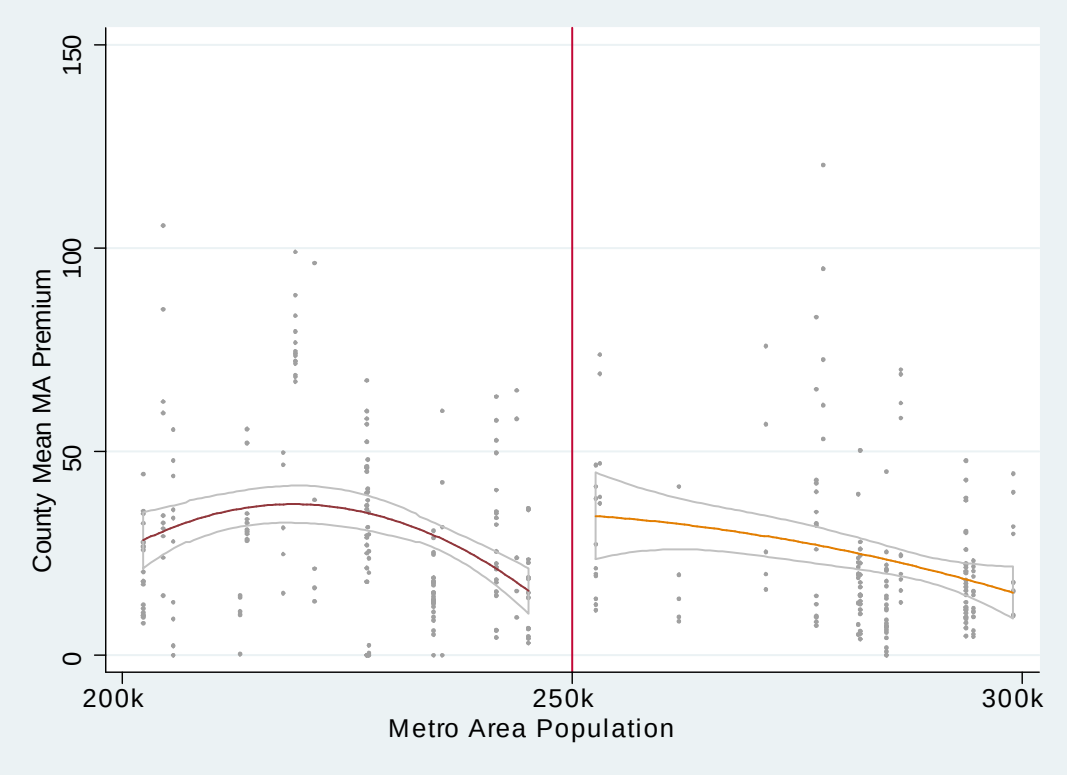


Figure 8: MA Premium Change at Population Discontinuity

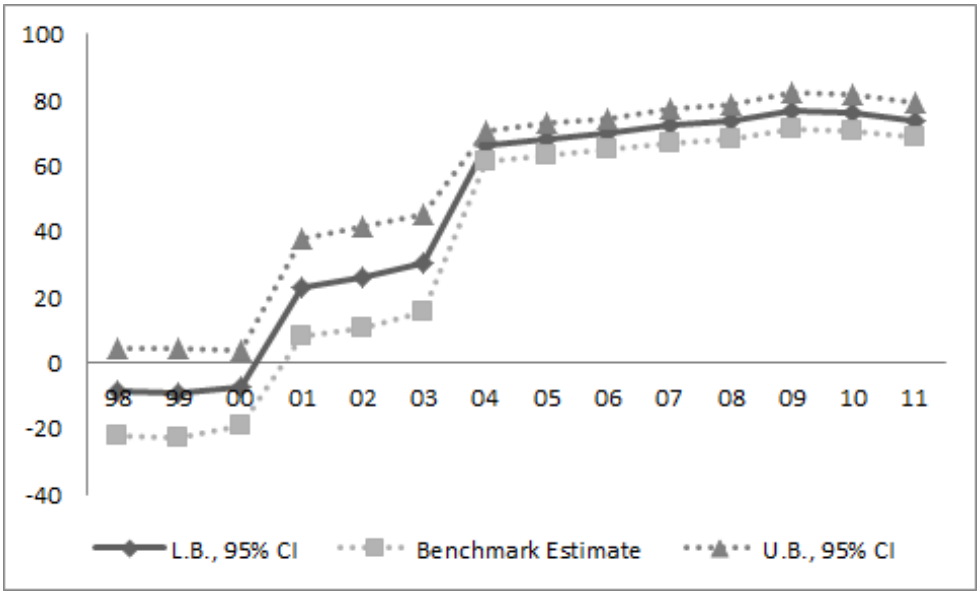


Figure 9: Effect of Urban Status on Benchmarks by Year

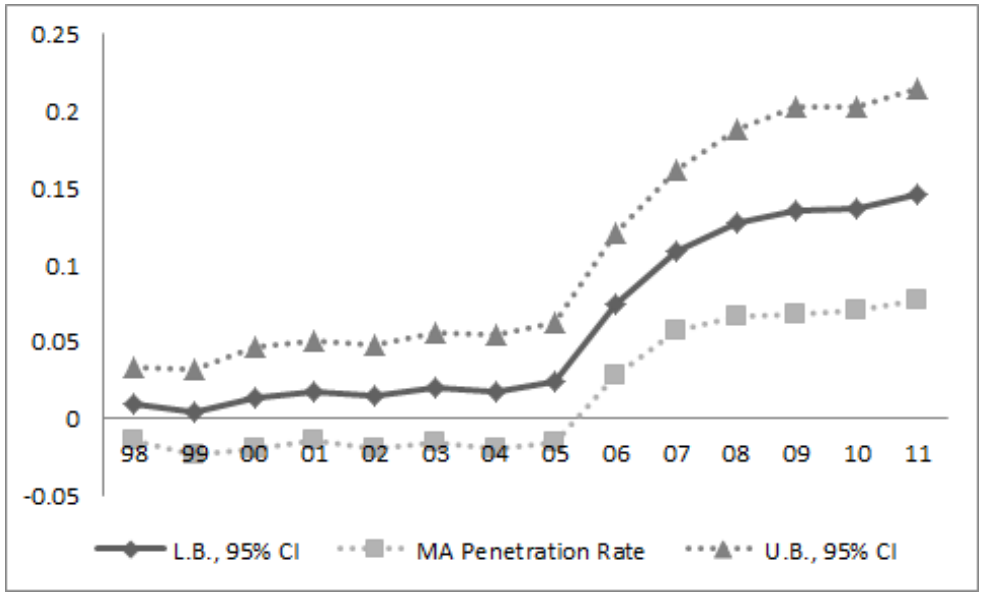


Figure 10: Effect of Urban Status on MA Penetration Rates by Year

Table 1: Summary Statistics: County & Financial

	All	*Sub-Group 1*	*Sub-Group 2*	*Sub-Group 3*
Per Capita 2007 FFS Restriction:	**None**	$<$***662***	$\geq$***662*** ***&*** $<$***732***	$\geq$***732***
Metro Pop (thousands)	472	239	616	1,109
	(1,209)	(661)	(1,103)	(2,180)
County Pop (thousands)	96	50	104	246
	(306)	(105)	(243)	(631)
Monthly Per Cap. FFS	680	615	732	839
	(104)	(60)	(29)	(72)
Medicare Enroll (thousands)	14.79	8.33	15.98	35.98
	(39.66)	(14.93)	(33.28)	(79.47)
MA Penetration Rate	0.12	0.12	0.11	0.14
	(0.10)	(0.10)	(0.09)	(0.13)
PFFS Penetration Rate	0.05	0.06	0.04	0.02
	(0.04)	(0.05)	(0.03)	(0.03)
HHI Index	5,117	5,168	5,070	5,002
	(2,212)	(2,244)	(2,168)	(2,155)
Floor Status (2007)	0.62	0.92	0.27	0.00
	(0.49)	(0.26)	(0.44)	(0.00)
MA Benchmark (Monthly)	764	726	771	888
	(75)	(32)	(32)	(84)
N	3044	1850	667	527
Out of Pocket Costs (monthly)	380.1	391.7	369.6	352.6
	(38.8)	(32.7)	(33.0)	(47.0)
Rebate Payment (monthly)	58.3	53.6	59.3	73.3
	(22.5)	(15.7)	(17.8)	(37.0)
Premium (monthly)	32.3	31.2	33.4	34.6
	(19.8)	(18.4)	(19.2)	(24.5)
Premium+OOPC	412.5	423.2	403.0	387.2
	(43.7)	(35.7)	(38.2)	(59.6)
Premium+OOPC-Rebate Pmt	356.4	372.6	344.3	314.3
	(61.2)	(45.0)	(51.6)	(91.7)
Percent Offering Drug Cov	68.8	64.9	73.7	76.4
	(27.8)	(28.3)	(25.9)	(25.8)
N	3028	1840	666	522

Notes: The first panel presents summaries of demographic, MA penetration, and other characteristics for different sets of counties. The second panel presents summaries of the financial characteristics of MA plans, across different sets of counties. Measures are denoted per enrollee, per month. These measures cover the 2007-2011 period, and are at a county level. The source data, which is at a plan level, is first aggregated to the county-year level; weighting is done based on plan enrollment levels. The countty-year data is then aggregated to a county-level, with each year weighed equally; thus the final observation level is at a county level. The original data is obtained from publicly available CMS files, including simulated out of pocket cost information, premium metrics, as well as other data.

Table 2: Most Active Firms in Markets of Interest

	All	*Sub-Group 1*	*Sub-Group 2*	*Sub-Group 3*
Per Capita 2007 FFS Rest:	**None**	***Below 662***	***Above 662 & Below 732***	***Above 732***
Humana Inc.	12,998	8,094	2,840	2,064
UnitedHealth Group, Inc.	7,146	4,444	1,407	1,295
Universal American Corp.	5,844	3,511	1,356	977
Coventry Health Care Inc.	5,463	3,427	1,121	915
WellPoint, Inc.	5,100	3,303	1,082	715
Aetna Inc.	4,042	1,826	1,077	1,139
XLHealth Corporation	2,099	974	677	448
WellCare Health Plans, Inc.	1,910	980	410	520
Blue Cross Blue Shield of Michigan	1,466	620	425	421
	15,020	**9,430**	**3,160**	**2,430**

Notes: Table presents number of county-year units through which any given firm offers contracts, where enrollment exceeds 10. This analysis extends for the period 2007-2011. The original data is obtained from publicly available CMS files, including contract-county level enrollment data and contract characteristics data.

Table 3: First Stage Regression Results

	(1)	(2)	(3)	(4)
VARIABLES	**County Benchmark**			
Urban	71.46***	22.72*	-22.14*	0.77
	(2.37)	(11.55)	(12.93)	(9.65)
County Pop (100k)	-1.67	-1.66	-8.32	-6.59
	(1.50)	(5.10)	(7.83)	(4.81)
County Pop (100k) Sq	0.51	0.18	0.62	0.72
	(0.48)	(0.95)	(1.45)	(0.91)
Metro Pop	0.61	1.59	22.99*	13.47
	(3.02)	(13.58)	(13.30)	(10.52)
Metro Pop Sq	-0.10	-0.28	-2.23	-1.41
	(0.37)	(1.61)	(1.74)	(1.33)
2007 FFS 5-yr	0.04***	0.55***	1.06***	1.04***
	(0.01)	(0.14)	(0.06)	(0.04)
FFS Restriction	**Group 1**	**Group 2**	**Group 3**	**Groups 2 & 3**
Observations	1,740	650	490	1,140
R-squared	0.970	0.659	0.533	0.523

Notes: Table presents results of our first-stage regression, a linear model with MA Benchmark as the outcome and urban as the instrument of interest. The unit of observation is at the county-year level, for the 2007-2011 period. Year fixed effects are included in the analysis. The county sample is restricted to a variety of FFS cost groupings, as specified. We include year-level indicators and also control for 5-yr per capita Medicare FFS spending, from 2007. Standard errors are clustered at the metro level. The original data is obtained from publicly available CMS files, including enrollment and other data. Note that populations are stated in terms of 100k.

Table 4: First Stage Regression Results: Pre-Period

	(1)	(2)	(3)	(4)
VARIABLES	**County Benchmark**			
Urban	-4.97	-3.49	24.76***	1.23
	(4.08)	(4.66)	(5.48)	(1.76)
Pre-2003 Urban		-3.06		48.88***
		(2.61)		(1.41)
County Pop (100k)	-5.35***	-4.84**	7.81***	-0.34
	(2.04)	(2.08)	(2.42)	(0.82)
County Pop (100k) Sq	1.26*	1.21*	-0.63	0.16
	(0.64)	(0.64)	(0.55)	(0.24)
Metro Pop	4.14	4.39	2.90	-1.08
	(4.47)	(4.46)	(3.46)	(1.91)
Metro Pop Sq	-0.44	-0.46	-0.09	0.15
	(0.57)	(0.58)	(0.53)	(0.25)
2007 FFS 5-yr	0.55***	0.55***	0.10***	0.06***
	(0.03)	(0.03)	(0.02)	(0.02)
FFS Restriction	**Group 1**			
Population Restriction	100-600k Metro Areas			
Year Range	*1998-2000*		*2001-2003*	
Observations	1,044	1,044	1,044	1,044
R-squared	0.848	0.849	0.677	0.950

Notes: Table presents results of our first-stage regression, a linear model with MA Benchmark as the outcome and urban as the instrument of interest. The unit of observation is at the county-year level, for the period specified. The sample is restricted to counties in the 100-600k metro population range, as well as to counties with 2007 FFS levels below the lowest floor value. We include year-level indicators and also control for 5-yr per capita Medicare FFS spending, from 2007. The original data is obtained from publicly available CMS files, including enrollment and other data. Note that populations are stated in terms of 100k.

Table 5: Reimbursement Impact: Market Structure and Plan Penetration

VARIABLES	(1) Insurers	(2) HHI	(3) HMO+PPO Sh.	(4) PFFS Sh.	(5) MA Sh.
Mean (Baseline Sample)	*6.49*	*3,907*	*0.097*	*0.068*	*0.166*
Urban	1.78***	-873**	0.071***	0.059***	0.131***
	(0.47)	(370)	(0.019)	(0.013)	(0.023)
2007 FFS 5-yr (100s)	-0.69***	558***	-0.041***	-0.031***	-0.072***
	(0.23)	(187)	(0.015)	(0.008)	(0.015)
N	1,740	1,728	1,740	1,740	1,740
Sample	*Baseline: 100-600k Metros, 2007-2011, 2007 FFS < 662*				
Urban	1.89***	-541	0.070***	0.041**	0.111***
	(0.52)	(373)	(0.021)	(0.016)	(0.026)
2007 FFS 5-yr (100s)	-0.35	486*	-0.034***	-0.021**	-0.054***
	(0.37)	(252)	(0.011)	(0.010)	(0.015)
N	750	739	750	750	750
Sample	*Robustness: Narrower Bandwidth Sample (150-350k Metros)*				
Urban	1.98***	-29	0.070**	0.026	0.096***
	(0.66)	(503)	(0.028)	(0.022)	(0.030)
2007 FFS 5-yr (100s)	-0.10	421	-0.023	-0.024*	-0.048*
	(0.47)	(361)	(0.017)	(0.014)	(0.024)
N	395	386	395	395	395
Sample	*Robustness: Narrower Bandwidth Sample (200-300k Metros)*				
Urban	-0.74	572	0.025	0.001	0.026
	(0.52)	(468)	(0.023)	(0.009)	(0.025)
2007 FFS 5-yr (100s)	-0.54**	140	0.011	-0.012**	-0.001
	(0.25)	(182)	(0.012)	(0.005)	(0.013)
N	1,150	1,137	1,150	1,150	1,150
Sample	*Falsification: High FFS Cnty Sample (2007 FFS > 662)*				
Urban	0.26	-964	0.013		0.013
	(0.52)	(1,037)	(0.025)		(0.025)
1997 FFS 5-yr (100s)	0.33*	185	0.035***		0.035***
	(0.17)	(474)	(0.011)		(0.011)
N	1,044	344	1,044		1,044
Sample	*Pre-Period Sample (1998-2000)*				

Notes: Table presents linear regression models, where outcome variables are measures of MA market structure and the financial characteristics of MA plans. The unit of observation is aggregated at the county-year, for the period specified. The original data is obtained from publicly available CMS files, including enrollment, landscape, OOPC, and other data. We exclude counties whose adjusted FFS level-as of 2007-was above that of the lowest possible floor. The sample of counties included the pre-period analyses remains the same as in the corresponding baseline period analyses. Finally, we restrict to those counties within the specified population band. Prior to 2004, only HMO plans could be offered, meaning that the MA share and HMO+PPO share levels are identical for the pre-period analysis. We include year-level indicators and also control for 5-yr per capita Medicare FFS spending, from 2007. We also include quadratic population controls, for counties as well as metros. Populations are stated in terms of 100k. Standard errors are clustered at the metro-level.

Table 6: Reimbursement Impact: Plan Characteristics

VARIABLES	(1) Premium	(2) Rebate	(3) OOPC	(4) Premium+OOPC	(5) Drug Coverage
Mean (Baseline Sample)	*33.49*	*54.40*	*379.54*	*413.03*	*0.658*
Urban	-1.00	3.52	-7.33	-8.33	-0.064
	(6.24)	(4.23)	(8.86)	(11.05)	(0.070)
2007 FFS 5-yr (100s)	2.32	-1.06	-10.11**	-7.79	0.106***
	(3.37)	(1.99)	(4.33)	(5.27)	(0.032)
N	1,701	1,360	1,701	1,701	1,701
Sample	*Baseline: 100-600k Metros, 2007-2011, 2007 FFS < 662*				
Urban	1.55	(1.19)	2.59	4.14	0.020
	(7.72)	(6.06)	(12.25)	(14.63)	(0.098)
2007 FFS 5-yr (100s)	0.56	2.97	-25.40***	-24.84***	0.099*
	(4.59)	(3.12)	(5.79)	(6.99)	(0.050)
N	711	568	711	711	711
Sample	*Robustness: Narrower Bandwidth Sample (150-350k Metros)*				
Urban	7.53	5.66	0.33	7.86	-0.050
	(8.47)	(8.84)	(18.73)	(20.54)	(0.147)
2007 FFS 5-yr (100s)	4.40	-2.20	-27.14***	-22.74**	0.081
	(5.07)	(4.54)	(7.68)	(9.40)	(0.073)
N	361	288	361	361	361
Sample	*Robustness: Narrower Bandwidth Sample (200-300k Metros)*				
Urban	-10.18	2.54	-8.81	-18.99	0.114
	(11.57)	(9.57)	(13.14)	(21.25)	(0.083)
2007 FFS 5-yr (100s)	-1.87	8.34*	-13.06***	-14.93**	0.020
	(3.07)	(4.89)	(4.98)	(6.64)	(0.020)
N	1,118	894	1,118	1,118	1,118
Sample	*Falsification: High FFS Cnty Sample (2007 FFS > 662)*				
Urban	-15.07				0.157
	(11.15)				(0.239)
1997 FFS 5-yr (100s)	-8.44				0.019
	(6.32)				(0.108)
N	85				85
Sample	*Falsification: Pre-Period Sample (2000)*				

Notes: Table presents linear regression models, where outcome variables are financial characteristics of MA plans. The unit of observation is aggregated at the county-year, for the 2007-2011 period. The original data is obtained from publicly available CMS files, including enrollment, landscape, OOPC, and other data. We exclude counties whose adjusted FFS level-as of 2007-was above that of the lowest possible floor. Finally, we restrict to those counties within the specified population band. Note that plan financial information only became available in 2000, meaning that our pre-period analysis only covers a single year. Further, note that plan rebates were only begun in 2006. We include year-level indicators and also control for 5-yr per capita Medicare FFS spending, from 2007. We also include quadratic population controls, for counties as well as metros. Populations are stated in terms of 100k. Standard errors are clustered at the metro-level.

Table 7: Summary Statistics: CAHPS Data

	All	100-600k	**100-600k, FFS Blw Floors**	
			Urban	*Non-Urban*
Overall Healthcare Received	8.45	8.49	8.52	8.48
	(0.71)	(0.49)	(0.38)	(0.60)
Primary Care Physician	9.00	9.02	9.03	9.03
	(0.58)	(0.37)	(0.31)	(0.45)
Specialist Physicians Seen	8.85	8.90	8.92	8.89
	(0.79)	(0.50)	(0.32)	(0.69)
Overall Health Plan	8.30	8.34	8.42	8.30
	(0.80)	(0.58)	(0.43)	(0.70)
Prescription Drug Benefits	8.32	8.33	8.40	8.27
	(0.86)	(0.57)	(0.38)	(0.69)
Specialists Seen	1.66	1.70	1.67	1.64
	(0.44)	(0.31)	(0.24)	(0.35)
Visits to Personal MD	2.01	1.97	1.94	1.89
	(0.63)	(0.51)	(0.39)	(0.59)
Visits for Routine Care	2.29	2.33	2.28	2.29
	(0.66)	(0.48)	(0.35)	(0.62)
Self-Reported Overall Health Status	2.96	2.95	2.93	2.94
	(0.41)	(0.31)	(0.26)	(0.37)
Self-Reported Mental Health Status	2.27	2.27	2.27	2.28
	(0.42)	(0.31)	(0.26)	(0.37)
No. Obs	2,923	560	167	195

Notes: This panel presents summaries of self-reported plan ratings, utilization, and outcomes for MA enrollees, across different sets of counties. The unit of aggregation is at the county-year level. The original measures were denoted for each enrollee, per year. The original data is taken from the CAHPS and is originally provided at an individual respondent level. Plan ratings are coded on a 0-10 scale, while self-reported health ratings are coded on a 1-5 scale. CAHPS survey data only covers plans that are at least a year old. As such, counties that have only new MA plans or no MA plans whatsoever do not appear in the data. SRH refers to self-reported health.

Table 8: CAHPS Ratings

	(1) Overall Health Plan	(2) Overall Healthcare	(3) PCP	(4) Specialist Seen	(5) Drug Benefits
Urban	-0.044	-0.177	-0.204**	-0.050	-0.067
	(0.157)	(0.126)	(0.083)	(0.116)	(0.126)
2007 FFS 5-yr (100s)	0.061***	0.010	-0.000	0.003	0.023
	(0.018)	(0.015)	(0.014)	(0.019)	(0.018)
Metro Pop (100k)	0.157	0.076	0.215**	0.092	0.228
	(0.173)	(0.139)	(0.097)	(0.129)	(0.161)
Metro Pop (100k) Sq	-0.022	-0.001	-0.021*	-0.009	-0.028
	(0.022)	(0.018)	(0.012)	(0.016)	(0.020)
Cnty Pop (100k)	-0.012	-0.019	-0.044	-0.055	-0.034
	(0.065)	(0.056)	(0.047)	(0.059)	(0.066)
Cnty Pop (100k) Sq	0.001	0.006	0.008	0.006	0.007
	(0.016)	(0.013)	(0.011)	(0.014)	(0.016)
Stand. Treat. Effect			-0.119		
			(0.083)		
Additional Controls			Year		
Counties			Metro 100-600k, 2007 FFS 5-yr Blw Floors		
Mean	8.39	8.51	9.02	8.9	8.35
	(0.92)	(0.81)	(0.63)	(0.86)	(0.98)
N	1,657	1,641	1,625	1,545	1,588
R-squared	0.029	0.023	0.015	0.007	0.025

Notes: Table presents linear regression models, where outcome variables are enrollee-reported ratings of plan quality. The unit of observation is at the county-year level, for the 2007-2011 period. The original data is obtained from CMS, from the CAHPS survey of MA enrollees; while the data was originally at an individual respondent level, we aggregate this data to the county-year level for purposes of our analysis. We exclude counties whose adjusted FFS level-as of 2007-was above that of the lowest possible floor. Further, we restrict to those counties within the 100-600k metro population band. Plan ratings are coded on a 0-10 scale, while self-reported health ratings are coded on a 1-5 scale. CAHPS survey data only covers plans that are at least a year old. As such, counties that have only new MA plans or no MA plans whatsoever do not appear in the data. We include year-level indicators and also control for 5-yr per capita Medicare FFS spending, from 2007. We also include controls for age categories, race, and gender. In addition, we include quadratic population controls, for counties as well as metros. Populations are stated in terms of 100k. Standard errors are clustered at the metro-level. Standardized treatment effects are calculated consistent with the approach in Kling et al (2007) and Finkelstein et al (2012).

Table 9: CAHPS Utilization and Health

	(1) Specialist Visits	(2) Personal MD Visits	(3) Routine Visits	(4) SRH Overall	(5) SRH Mental Health
Urban	-0.029	0.054	-0.070	0.094	0.121
	(0.080)	(0.110)	(0.121)	(0.081)	(0.084)
2007 FFS 5yr (in 100s)	0.011	0.007	-0.001	-0.012	-0.005
	(0.012)	(0.016)	(0.017)	(0.009)	(0.009)
Metro Pop (100k)	0.080	-0.065	0.068	-0.010	-0.126
	(0.088)	(0.114)	(0.136)	(0.089)	(0.083)
Metro Pop (100k) Sq	-0.011	0.010	-0.006	-0.004	0.013
	(0.011)	(0.015)	(0.017)	(0.012)	(0.011)
Cnty Pop (100k)	0.054	-0.139**	-0.042	-0.131***	-0.146***
	(0.040)	(0.054)	(0.053)	(0.043)	(0.042)
Cnty Pop (100k) Sq	-0.007	0.028*	0.010	0.025**	0.029***
	(0.009)	(0.014)	(0.013)	(0.010)	(0.010)
Stand. Treat. Effect			0.071		
			(0.110)		
Additional Controls			Year		
Counties			Metro 100-600k, 2007 FFS 5 yr Blw Floors		
Mean	1.66	1.90	2.27	2.92	2.26
	(0.50)	(0.67)	(0.75)	(0.47)	(0.46)
N	1,554	1,651	1,661	1,661	1,662
R-squared	0.009	0.014	0.010	0.034	0.024

Notes: Table presents linear regression models, where outcome variables are enrollee-reported utilization levels and health status. The unit of observation is at the county-year level, for the 2007-2011 period. The original data is obtained from CMS, from the CAHPS survey of MA enrollees; while the data was originally at an individual respondent level, we aggregate this data to the county-year level for purposes of our analysis. We exclude counties whose adjusted FFS level-as of 2007-was above that of the lowest possible floor. Further, we restrict to those counties in the 100-600k metro population band. Plan ratings are coded on a 0-10 scale, while self-reported health ratings are coded on a 1-5 scale. CAHPS survey data only covers plans that are at least a year old. As such, counties that have only new MA plans or no MA plans whatsoever do not appear in the data. We include year-level indicators and also control for 5-yr per capita Medicare FFS spending, from 2007. We also include controls for age categories, race, and gender. In addition, we include quadratic population controls, for counties as well as metros. Populations are stated in terms of 100k. Standard errors are clustered at the metro-level. Standardized treatment effects are calculated consistent with the approach in Kling et al (2007) and Finkelstein et al (2012).

Table 10: MA Enrollment Composition Analyses: From CAHPS Data

	100-600k Metro & 2007 FFS Below Floors	
	Urban	*Non-Urban*
Age		
65-74	31.9%	29.5%
75-80	24.7%	24.6%
81-84	17.2%	17.9%
85+	12.0%	13.1%
Unknown	7.5%	8.8%
White	90.2%	91.8%
Female	54.1%	53.7%
MD Visits	1.77	1.76
Specialist Visits	1.67	1.66
Routine Care Visits	2.17	2.18
General Health Self-Assess	2.77	2.78
Mental Health Self-Assess	2.11	2.12

Note: This panel presents summaries of demographics and self-reported utilization. This data is taken from the CAHPS survey, and is provided at an individual respondent level, for the 2007-2011 period. The utilization measures are denoted for each enrollee, per year.

Table 11: MA Bid Analysis

	(1)	(2)
	Bid As	
	Fract of Benchmark	*Tot Amount*
Urban	**0.004**	
	(0.008)	
Instr. County Benchmark		**0.933*** **
		(0.082)
2007 FFS 5yr (in 100s)	0.004	2.634
	(0.003)	(2.411)
Metro Pop (100k)	-0.006	-4.106
	(0.009)	(6.215)
Metro Pop (100k) Sq	0.001	0.507
	(0.001)	(0.805)
Cnty Pop (100k)	0.001	0.699
	(0.003)	(2.398)
Cnty Pop (100k) Sq	-0.001	-0.524
	(0.001)	(0.69)
Counties	Metro 100-600k, & 2007 FFS 5 yr Blw 662	
Mean	0.897	665.76
	(0.034)	(52.55)
N	1,360	1,360
R-squared	0.339	0.858

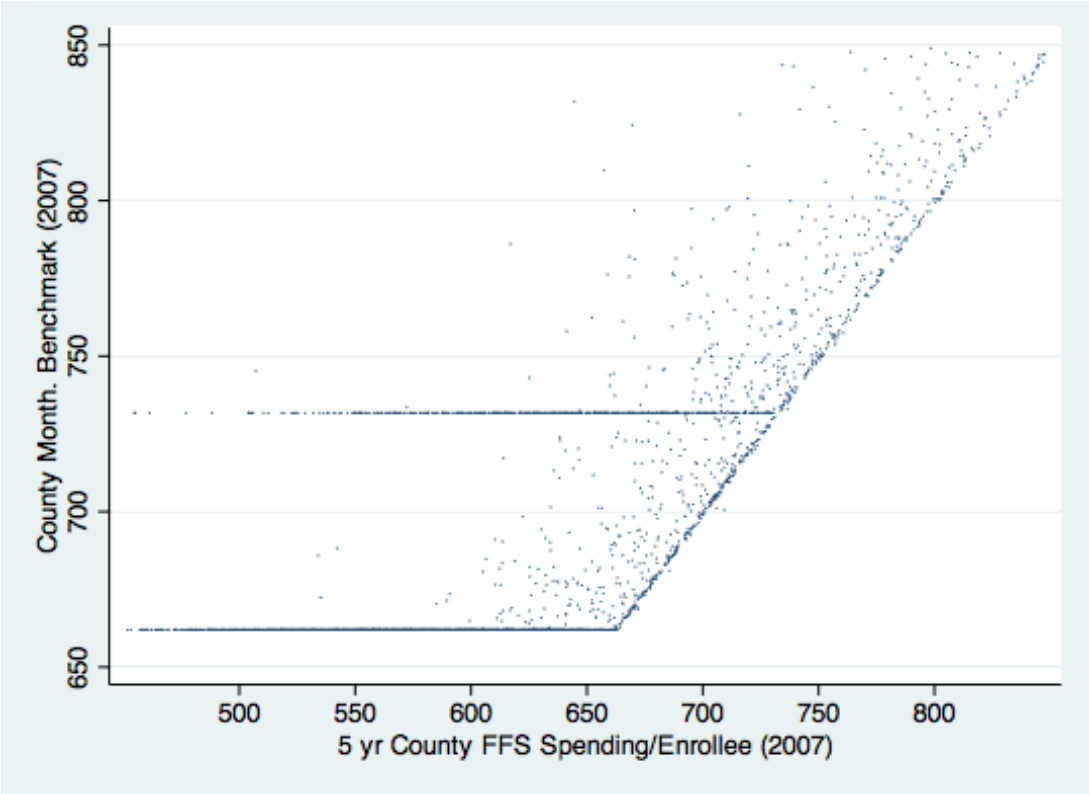
Notes: Table presents linear regression model, where outcome variable include plan bids, as fractions of benchmarks and in absolute terms. The unit of observation is aggregated to the county-year level. The underlying data is from CMS and covers the 2007-2010 period. In our sample construction, exclude counties whose adjusted FFS level-as of 2007-was above that of the lowest possible floor. Further, we restrict to those counties in the 100-600k metro population band. We include year-level indicators and also control for 5-yr per capita Medicare FFS spending, from 2007. Populations are stated in terms of 100k. Standard errors are clustered at the metro-level.

Table 12: Advertising Spending in $ per Medicare Beneficiary

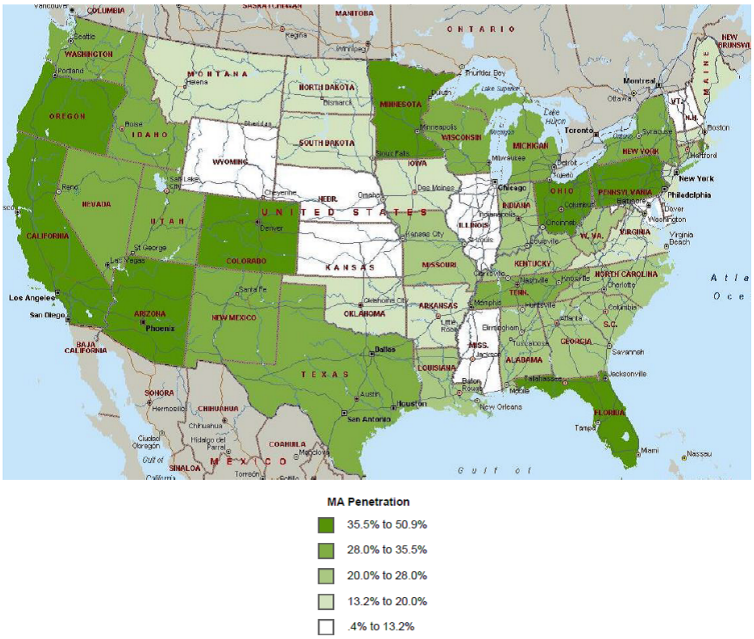
	(1)	(2)	(3)	(4)
Panel A				
% Urban Floor	6.562***		7.501***	6.214***
	(1.638)		(1.608)	(1.714)
FFS Spending		-2.541***		-1.796**
		(0.808)		(0.842)
Ad Price Index Controls			X	X
N	840	840	840	840
R-Squared	0.060	0.053	0.108	0.113
Panel B				
% Urban Floor	4.634**		6.762***	4.405*
	(2.141)		(2.121)	(2.401)
% Rural Floor	2.366		1.999	-0.346
	(1.813)		(1.771)	(2.097)
% Urban	4.333*		2.127	2.390
	(2.605)		(2.567)	(2.565)
FFS Spending		-2.541***		-2.189**
		(0.808)		(1.053)
Ad Price Index Controls			X	X
N	840	840	840	840
R-Squared	0.063	0.053	0.110	0.114

Notes: Table present results of an OLS regression with TV spot advertising expenditures for Medicare insurance products per Medicare beneficiary per year as the dependent variable. The unit of observation is the DMA-year. The key explanatory variables of interest, % Urban Floor and % Rural Floor are aggregated from the county-level dataset using the same crosswalk provided by Gentzkow and Shapiro (2008). Population controls include a quadratic in metro-area population, and are included in all specifications. Advertising price index is given in SQAD points.

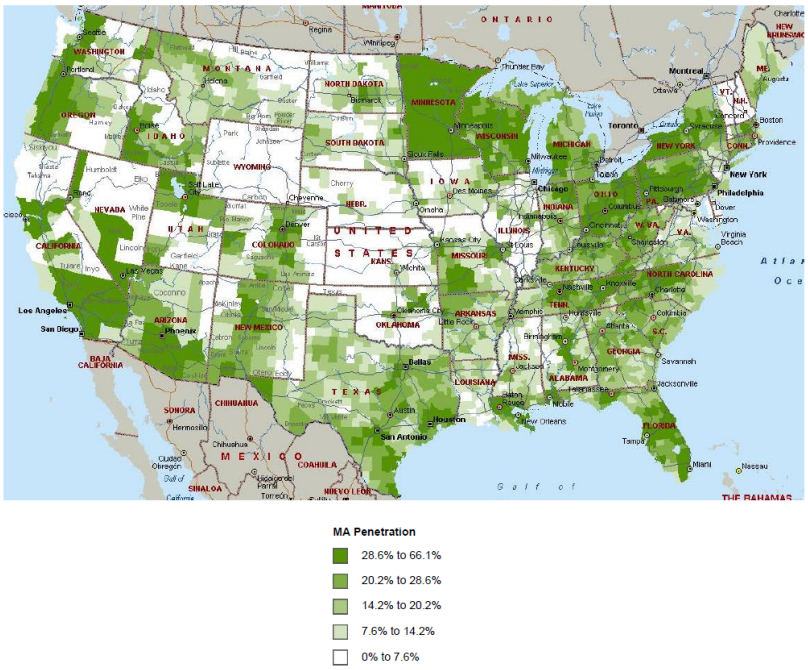
Appendix: For Online Publication Only



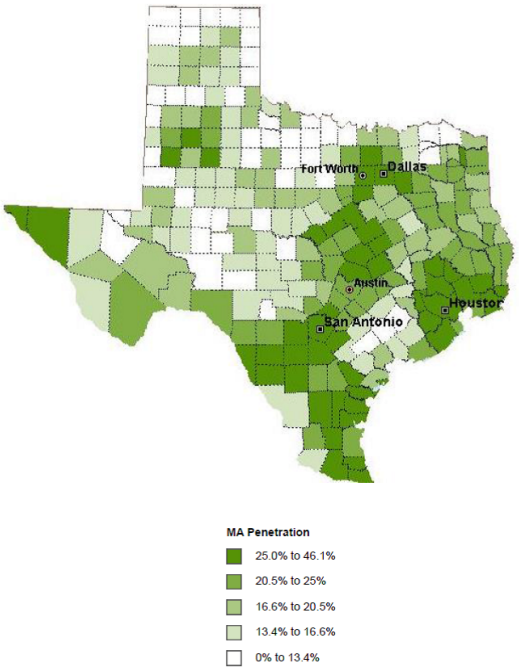
Appendix Figure I: FFS Costs and County Benchmarks



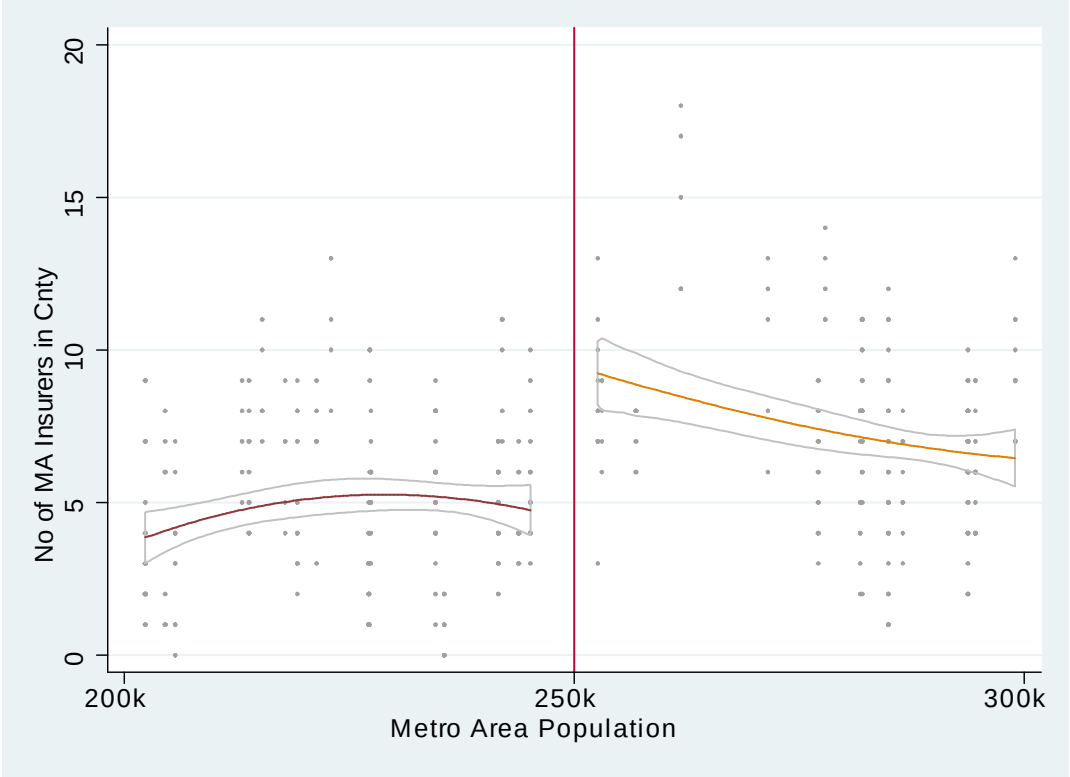
Appendix Figure II: 2014 Medicare Advantage Market Penetration, By State



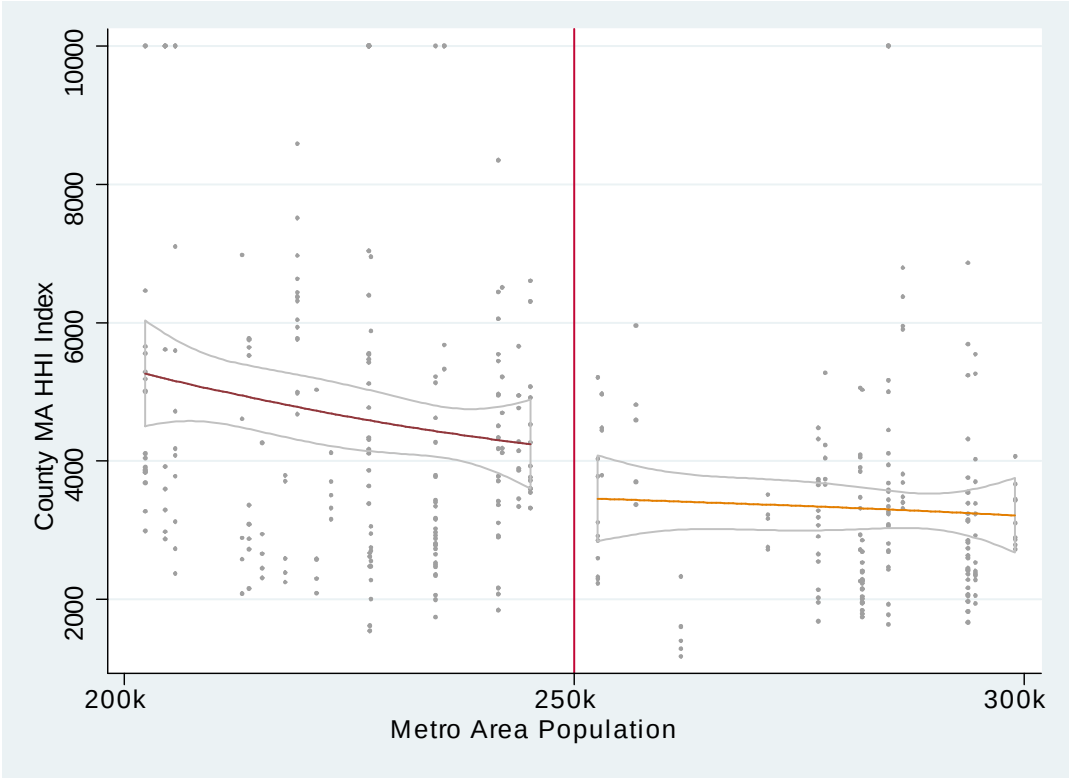
Appendix Figure III: 2014 Medicare Advantage Market Penetration, By County



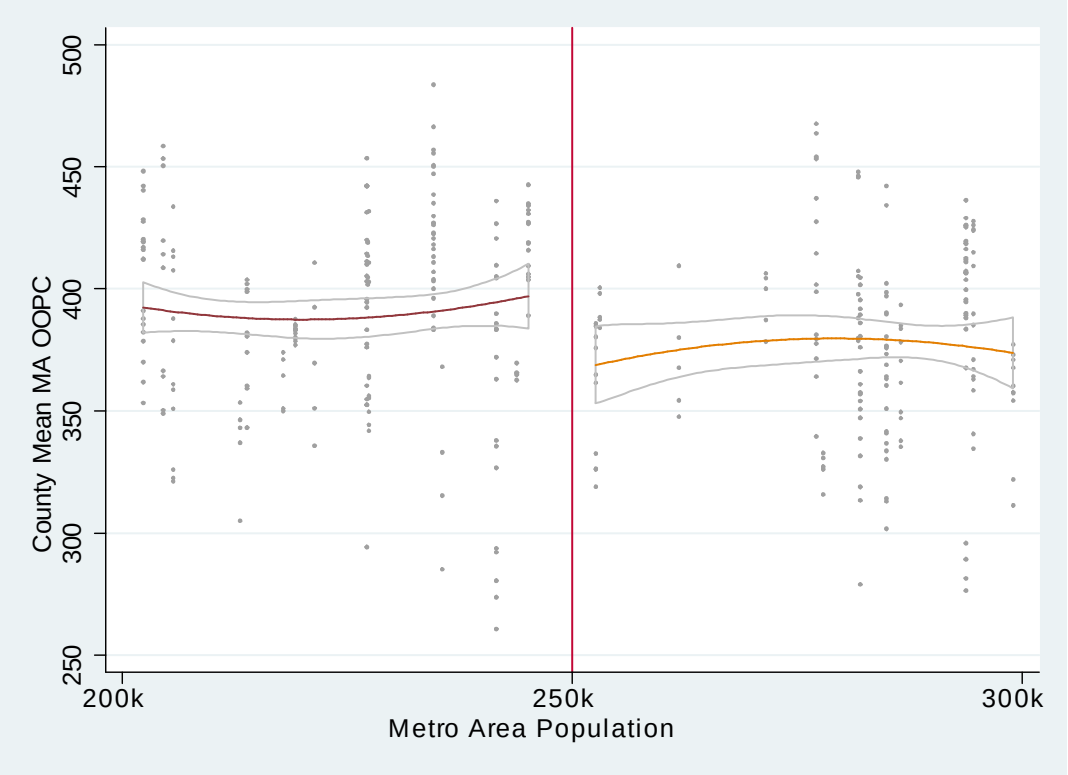
Appendix Figure IV: 2014 Texas Medicare Advantage Market Penetration, By County



Appendix Figure V: Change in Number of Insurers at Population Discontinuity



Appendix Figure VI: Change in HHI at Population Discontinuity



Appendix Figure VII: Change in OOPC at Population Discontinuity

Table A.1: Covariate Table

	Analysis Sample		**Within 50k of boundary**				
	Mean	*Std. Dev.*	*Bound Sample Mean*	*Low Side Mean*	*High Side Mean*	*Difference in Means*	*Test of Diff*
County Bnchmk	747	46	746	719	782	63	13.52
Market Structure							
No of Insurers	6.17	2.64	5.88	4.85	7.24	2.39	3.44
HHI Index	3,970	1,634	4,190	4,854	3,313	-1,541	-3.3
MA Share	0.167	0.104	0.136	0.097	0.187	0.090	3.32
PFFS Share	0.074	0.049	0.071	0.052	0.097	0.045	2.73
PPO Share	0.039	0.040	0.029	0.020	0.041	0.021	1.76
HMO Share	0.053	0.080	0.035	0.025	0.049	0.024	1.66
Fin Chars							
Drug Cov	0.66	0.20	0.62	0.63	0.59	-0.04	-0.63
Rebate Pmt	57.3	13.6	57.9	58.3	57.4	-1.0	-0.16
Prem	30.4	18.3	26.6	29.0	23.6	-5.4	-0.95
OOPC	382.1	28.6	382.7	387.2	377.2	-10.1	-1
OOPC+ Prem	412.5	32.7	409.3	416.2	400.8	-15.4	-1.44
Cnty Chars							
5 yr FFS	591.7	47.0	586.1	585.4	587.0	1.7	0.12
Medicare Enroll	15,666	14,920	15,221	12,760	18,479	5,719	1.62
County Pop	97,827	97,344	94,056	83,426	108,127	24,701	1.1
Metro Pop	273,234	139,752	249,738	225,303	282,077	56,774	11.03
Percent White	88.22	14.15	88.98	90.06	87.54	-2.53	-0.56
Percent Black	7.98	13.16	7.46	6.69	8.48	1.79	0.38
Percent Hispanic	5.99	10.45	5.89	7.67	3.54	-4.14	-1.39
Percent Female (Among 65+)	0.57	0.02	0.57	0.57	0.58	0.01	1.94
Personal Income	28,415	4,681	28,903	29,182	28,545	-637	-0.66
Number of Counties	*348*		*79*	*45*	*34*		

Notes: Panel presents balance table, showing mean values of outcomes and county characteristics in our baseline sample; we also present means within a 100k band around the metro population discontinuity, as well as in 50k bands on either side of the metro population discontinuity. Finally, we run t-tests for these measures, for differences across the discontinuity within the 200-300k metro population sample; for these t-tests, we cluster standard-errors at the metro-level.

Table A.2: Population Trends Stability

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep Var.	Insurers	HHI	HMO/PPO Sh.	PFFS Sh.	MA Sh.	Prem.	Rebate	OOPC
Urban	1.64***	-756**	0.068***	0.054***	0.122***	-5.33	5.67	-2.35
	(0.44)	(324)	(0.021)	(0.013)	(0.024)	(5.93)	(3.50)	(8.02)
Metro Pop Controls	Linear							
Urban	1.78***	-873**	0.071***	0.059***	0.131***	-1.00	3.52	-7.33
	(0.47)	(370)	(0.019)	(0.013)	(0.023)	(6.24)	(4.23)	(8.86)
Metro Pop Controls	Quadratic							
Urban	1.61***	-698*	0.051**	0.058***	0.109***	-2.16	0.99	1.63
	(0.50)	(398)	(0.022)	(0.015)	(0.026)	(7.10)	(4.35)	(10.04)
Metro Pop Controls	Cubic							
Urban	1.74***	-593	0.063***	0.050***	0.112***	5.76	-0.16	0.96
	(0.52)	(420)	(0.023)	(0.017)	(0.027)	(9.10)	(5.97)	(12.98)
Metro Pop Controls	Quartic							
Urban	1.48***	-351	0.053**	0.039***	0.092***	-18.45	8.33	15.39
	(0.48)	(382)	(0.025)	(0.014)	(0.026)	(11.55)	(6.86)	(15.52)
Metro Pop Controls	Linear Trend on Each Side of Discontinuity							

Notes: Table presents linear regression models, where outcome variables include measures of MA plan penetration, market structure, and plan financial characteristics, as specified by the column. The unit of observation is aggregated at the county-year, for the 2007-2011 period. The original data is obtained from publicly available CMS files, including enrollment, landscape, OOPC, and other data. We exclude counties whose adjusted FFS level-as of 2007-was above that of the lowest possible floor. In addition, we restrict to those counties within the specified metro population band of 100,000 to 600,000. We include quadtratic controls in county and metro-area population. We also control for 1997 per capita Medicare FFS spending, and include year-level indicators. Each panel includes increasingly flexible population controls for metro-level populations, which determines urban and rural status. Standard errors are clustered at the metro-area level.

Table A.3: Bandwidth Tests

Dep Var.	(1) Insurers	(2) HHI	(3) HMO/PPO Sh.	(4) PFFS Sh.	(5) MA Sh.	(6) Prem.	(7) Rebate	(8) OOPC
Urban	1.78***	-873**	0.071***	0.059***	0.131***	-1.00	3.52	-7.33
	(0.47)	(370)	(0.019)	(0.013)	(0.023)	(6.24)	(4.23)	(8.86)
N	1,740	1,728	1,740	1,740	1,740	1,701	1,360	1,701
Metro Pop Restriction				***100,000-600,000***				
Urban	1.61***	-563	0.061***	0.059***	0.120***	3.79	-0.76	-2.54
	(0.48)	(351)	(0.021)	(0.015)	(0.026)	(6.75)	(4.33)	(10.69)
N	1,380	1,368	1,380	1,380	1,380	1,341	1,072	1,341
Metro Pop Restriction				***100,000-400,000***				
Urban	1.89***	-541	0.070***	0.041**	0.111***	1.55	-1.19	2.59
	(0.52)	(373)	(0.021)	(0.016)	(0.026)	(7.72)	(6.06)	(12.24)
N	750	739	750	750	750	711	568	711
Metro Pop Restriction				***150,000-350,000***				
Urban	1.99***	-29	0.070**	0.026	0.096***	7.53	5.66	0.33
	(0.66)	(503)	(0.028)	(0.022)	(0.030)	(8.47)	(8.84)	(18.73)
N	395	386	395	395	395	361	288	361
Metro Pop Restriction				***200,000-300,000***				

Notes: Table presents linear regression models, where outcome variables include measures of MA plan penetration, market structure, and plan financial characteristics, as specified by the column. The unit of observation is aggregated at the county-year, for the 2007-2011 period. The original data is obtained from publicly available CMS files, including enrollment, landscape, OOPC, and other data. We exclude counties whose adjusted FFS level-as of 2007-was above that of the lowest possible floor. Finally, we restrict to those counties within the specified metro population band. We include quadtratic controls in county and metro-area population. We also control for 1997 per capita Medicare FFS spending, and include year-level indicators. Standard errors are clustered at the metro-area level.

Table A.4: Falsification Test-High FFS Cnty Sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dep Var.	Benchmark	Insurers	HHI	HMO+PPO Sh.	PFFS Sh.	MA Sh.	Premium	OOPC	Rebate
Urban	0.38	-0.74	572	0.025	0.001	0.026	-10.18	2.54	-8.81
	(7.89)	(0.52)	(468)	(0.023)	(0.009)	(0.025)	(11.56)	(9.57)	(13.14)
2007 FFS 5yr (in 100s)	103.57***	-0.54**	140	0.011	-0.012**	-0.001	-1.87	8.34*	-13.06***
	(3.65)	(0.25)	(182)	(0.012)	(0.005)	(0.013)	(3.07)	(4.89)	(4.98)
Metro Pop (100k)	13.86	0.01	14	-0.058*	0.016	-0.042	3.83	3.22	-0.22
	(9.12)	(0.62)	(545)	(0.032)	(0.010)	(0.033)	(11.45)	(11.11)	(14.65)
Metro Pop (100k) Sq	-1.51	0.09	-30	0.011**	-0.002	0.009*	-0.25	-0.16	-0.18
	(1.19)	(0.09)	(77)	(0.005)	(0.001)	(0.005)	(1.45)	(1.37)	(1.95)
Cnty Pop (100k)	-5.24	1.10**	-999**	-0.000	0.004	0.004	4.51	-9.79*	9.75
	(5.26)	(0.44)	(417)	(0.019)	(0.007)	(0.020)	(5.04)	(5.11)	(8.03)
Cnty Pop (100k) Sq	1.07	-0.40***	270***	0.000	-0.001	-0.001	-1.51	0.49	0.21
	(0.95)	(0.08)	(68)	(0.004)	(0.001)	(0.003)	(0.92)	(0.81)	(1.44)
Additional Controls	Year								
Counties	Metro 100-600k, FFS 5 yr Above 662 (from 2007)								
Mean	814.68	6.69	4,324	0.109	0.034	0.143	35.83	360.01	67.20
	(75.17)	(3.550)	(1,987)	(0.115)	(0.042)	(0.112)	(28.98)	(39.88)	(30.31)
N	1,150	1,150	1,137	1,150	1,150	1,150	1,118	894	1,118
R-squared	0.87	0.64	0.15	0.31	0.18	0.27	0.12	0.22	0.16

Notes: Table presents linear regression models, where outcome variables include measures of MA plan penetration, market structure, and plan financial characteristics, as specified by the column. The unit of observation is aggregated at the county-year, for the 2007-2011 period. The original data is obtained from publicly available CMS files, including enrollment, landscape, OOPC, and other data. We exclude counties whose adjusted FFS level-as of 2007-was above that of the lowest possible floor. Finally, we restrict to those counties within the metro population band of 100,000 to 600,000. We include quatin county population and 2007 per capita Medicare FFS spending. FFS spending is omitted as an explanatory variable in the first column. We include quadtratic controls in county and metro-area population, as well as controls for 2007 5-yr per capita Medicare FFS spending, and include year-level indicators. Standard errors are clustered at the metro-area level.

Table A.5: Falsification Test, Pre-Period

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dep. Var.	Benchmark	No. Insurers	Any Insurers	MA Share	HHI	Prem	Drug Cov
Urban	-4.242	0.259	0.125	0.013	-964	-15.070	0.157
	(3.720)	(0.520)	(0.102)	(0.025)	(1,037)	(11.146)	(0.239)
1997 FFS in $100s	59.070***	0.328*	0.173***	0.035***	185	-8.440	0.019
	(3.168)	(0.172)	(0.055)	(0.011)	(474)	(6.324)	(0.108)
Metro Pop	5.206	-0.669	-0.319**	-0.013	1,632	9.239	-0.516*
	(4.290)	(0.561)	(0.133)	(0.029)	(1,254)	(15.469)	(0.299)
Metro Pop Sq	-0.602	0.079	0.047**	0.001	-197	-0.857	0.072*
	(0.568)	(0.073)	(0.019)	(0.004)	(173)	(2.046)	(0.040)
Cnty Pop	-3.939	0.866***	0.425***	0.030**	-710	11.324	0.200
	(2.396)	(0.269)	(0.060)	(0.014)	(728)	(7.861)	(0.147)
Cnty Pop Sq	0.920	0.031	-0.059***	0.002	-25	-1.585	-0.030
	(0.713)	(0.066)	(0.015)	(0.004)	(158)	(1.682)	(0.031)
Additional Controls				Year			
Mean	405.78	0.734	0.428	0.03	8232	42.3	0.507
	(33.13)	(1.44)	(0.50)	(0.07)	(2,337)	(22.59)	(0.405)
Observations	1,044	1,044	1,044	1,044	344	85	85
R-squared	0.863	0.320	0.263	0.216	0.131	0.104	0.093

Notes: Table presents linear regression models, where outcome variables include measures of MA plan penetration, market structure, and plan financial characteristics, as specified by the column. The unit of observation is aggregated at the county-year. The market structure variables cover the 1998-2000 period, while the financial characteristic variables (premium levels and drug coverage) cover only 2000. The original data is obtained from publicly available CMS files, including enrollment, landscape, and other data. We exclude counties whose adjusted FFS level-as of 2007-was below that of the lowest possible floor. We restrict to those counties within the metro population band of 100,000 to 600,000, also as of 2007. Altogether, the composition of counties in the pre-period sample is identical to those included for the baseline period sample. We include quadtratic controls in county and metro-area population. We also control for 1997 per capita Medicare FFS spending, and include year-level indicators. Standard errors are clustered at the metro area level.

Table A.6: Additional Metrics

VARIABLES	(1) FFS Costs	(2) Risk Scores	(3)	(4)	(5)	(6)
			Star Ratings			
			Health Outcomes	*Chronic Care Mgmt*	*Cust Service*	*Plan Ratings*
Urban	0.89	0.021	0.147	0.099	-0.061	0.271*
	(14.61)	(0.025)	(0.145)	(0.144)	(0.116)	(0.139)
2007 FFS 5yr (in 100s)		0.065***	0.019	-0.025	0.027	0.029
		(0.009)	(0.026)	(0.025)	(0.026)	(0.026)
Metro Pop (100k)	28.18	0.013	-0.057	-0.035	0.078	-0.184
	(17.49)	(0.009)	(0.159)	(0.142)	(0.126)	(0.148)
Metro Pop (100k) Sq	-3.66	-0.003	0.007	0.001	-0.010	0.020
	(2.30)	(0.002)	(0.023)	(0.019)	(0.018)	(0.019)
Cnty Pop (100k)	7.87	0.005	0.176	0.225*	-0.011	0.054
	(15.46)	(0.029)	(0.129)	(0.121)	(0.075)	(0.141)
Cnty Pop (100k) Sq	2.22	-0.002	-0.037**	-0.028*	0.005	-0.024
	(2.10)	(0.004)	(0.019)	(0.017)	(0.012)	(0.018)
Additional Controls			Year			
Counties			Metro 100-600k, FFS 5 yr Below 662 (from 2007)			
Mean	642.98	0.886	3.147	2.460	3.760	3.300
	(63.75)	(0.081)	(0.570)	(0.570)	(0.630)	(0.580)
N	1,740	1,724	1,270	1,224	1,387	1,394
R-squared	0.251	0.197	0.139	0.281	0.268	0.213

Notes: Table presents linear regression models, where outcome variables include measures of MA & FFS enrollee composition, as well as plan star ratings, as specified in the column. The unit of observation is aggregated at the county-year. The market structure variables cover the 2007-2011 period. The original data is obtained from publicly available CMS files, including enrollment, star ratings, and other data. We exclude counties whose adjusted FFS level-as of 2007-was below that of the lowest possible floor. We restrict to those counties within the metro population band of 100,000 to 600,000, also as of 2007. We include quadtratic controls in county and metro-area population. We also control for 1997 per capita Medicare FFS spending, and include year-level indicators. Standard errors are clustered at the metro=area level

Table A.7: Market Structure Baseline Analysis-Expanded

VARIABLES	(1) Insurers	(2) HHI	(3) HMO+PPO Sh.	(4) PFFS Sh.	(5) MA Sh.
Urban	1.78***	-873**	0.071***	0.059***	0.131***
	(0.47)	(370)	(0.019)	(0.013)	(0.023)
2007 FFS 5yr (in 100s)	-0.69***	558***	-0.041***	-0.031***	-0.072***
	(0.22)	(187)	(0.015)	(0.008)	(0.015)
Metro Pop (100k)	-0.57	435	-0.014	-0.022*	-0.036
	(0.59)	(465)	(0.023)	(0.013)	(0.024)
Metro Pop (100k) Sq	0.05	-38	0.001	0.002	0.003
	(0.09)	(65)	(0.003)	(0.002)	(0.004)
Cnty Pop (100k)	0.37	-574	-0.001	-0.003	-0.004
	(0.49)	(407)	(0.021)	(0.012)	(0.023)
Cnty Pop (100k) Sq	-0.38***	169**	-0.005	-0.001	-0.005
	(0.07)	(77)	(0.004)	(0.002)	(0.003)
Mean	*6.49*	*3,907*	*0.097*	*0.068*	*0.166*
	(3.072)	(1,802)	(0.105)	(0.060)	(0.108)
N	1,740	1,728	1,740	1,740	1,740
R-squared	0.61	0.167	0.303	0.277	0.320

Notes: Table presents linear regression models, where outcome variables are measures of MA market structure and the financial characteristics of MA plans. The unit of observation is aggregated at the county-year, for the 2007-2011 period. The original data is obtained from publicly available CMS files, including enrollment, landscape, OOPC, and other data. We exclude counties whose adjusted FFS level-as of 2007-was above that of the lowest possible floor. Further, we restrict to those counties within the 100-600k metro population band. We include a control for 5-yr per capita Medicare FFS spending, from 2007, and also include year-level indicators. We also include quadratic population controls, for counties as well as metros. Populations are stated in terms of 100k. Standard errors are clustered at the metro-level.

Table A.8: CAHPS Ratings, 150-350k Sample

	(1) Overall Health Plan	(2) Overall Healthcare	(3) PCP	(4) Specialist Seen	(5) Drug Benefits
Urban	-0.018	0.064	-0.081	0.074	-0.021
	(0.198)	(0.200)	(0.108)	(0.145)	(0.157)
2007 FFS 5yr (in 100s)	0.022	0.042	0.012	0.017	0.038
	(0.033)	(0.046)	(0.020)	(0.030)	(0.026)
Metro Pop (100k)	-0.026	0.295	-0.254	0.450	-0.257
	(0.930)	(0.736)	(0.414)	(0.594)	(0.623)
Metro Pop (100k) Sq	-0.001	-0.089	0.052	-0.111	0.038
	(0.181)	(0.150)	(0.080)	(0.118)	(0.116)
Cnty Pop (100k)	0.068	-0.014	-0.079	0.212	-0.122
	(0.242)	(0.225)	(0.170)	(0.200)	(0.197)
Cnty Pop (100k) Sq	0.029	0.089	0.079	0.003	0.093
	(0.066)	(0.065)	(0.049)	(0.059)	(0.057)
Standarized Treatment Effect			-0.002		
			(0.104)		
Mean	8.41	8.51	9.04	8.88	8.39
	(0.99)	(0.82)	(0.62)	(0.93)	(0.94)
N	650	642	635	598	622
R-squared	0.039	0.037	0.029	0.011	0.044

Notes: Table presents linear regression models, where outcome variables are enrollee-reported levels of plan quality, levels of utilization, and health status. The unit of observation is at the county-year level, for the 2007-2011 period. The original data is obtained from CMS, from the CAHPS survey of MA enrollees; while the data was originally at an individual respondent level, we aggregate this data to the county-year level for purposes of our analysis. We exclude counties whose adjusted FFS level-as of 2007-was above that of the lowest possible floor. Finally, we restrict to those counties within the 150-350k population band. We include a control for 2007 per capita Medicare FFS spending and include year-level indicators. We also include quadratic population controls, for counties as well as metros. Populations are stated in terms of 100k. Standard errors are clustered at the metro-level. Standardized treatment effects are calculated consistent with the approach in Kling et al (2007) and Finkelstein et al (2012). All specifications include controls for age categories, race, and gender.

Table A.9: CAHPS Utilization and Health, 150-350k Sample

	(1) Specialist Visits	(2) Personal MD Visits	(3) Routine Visits	(4) SRH Overall	(5) SRH Mental Health
Urban	0.099	-0.111	-0.142	-0.087	0.006
	(0.100)	(0.159)	(0.137)	(0.115)	(0.116)
2007 FFS 5yr (in 100s)	-0.011	-0.042	-0.018	-0.013	0.007
	(0.032)	(0.028)	(0.030)	(0.016)	(0.016)
Metro Pop (100k)	0.237	0.202	0.417	-0.517	-0.267
	(0.394)	(0.597)	(0.597)	(0.426)	(0.453)
Metro Pop (100k) Sq	-0.059	-0.011	-0.060	0.130	0.061
	(0.078)	(0.123)	(0.112)	(0.082)	(0.088)
Cnty Pop (100k)	0.030	-0.206	-0.244	-0.196	0.032
	(0.115)	(0.199)	(0.258)	(0.201)	(0.180)
Cnty Pop (100k) Sq	-0.014	0.043	0.063	0.007	-0.022
	(0.037)	(0.063)	(0.077)	(0.056)	(0.055)
Standardized Treatment Effect			-0.057		
			(0.155)		
Mean	1.70	1.89	2.28	2.93	2.25
	(0.55)	(0.69)	(0.78)	(0.48)	(0.47)
N	602	645	651	652	652
R-squared	0.009	0.038	0.024	0.055	0.016

Notes: Table presents linear regression models, where outcome variables are enrollee-reported levels of plan quality, levels of utilization, and health status. The unit of observation is at the county-year level, for the 2007-2011 period. The original data is obtained from CMS, from the CAHPS survey of MA enrollees; while the data was originally at an individual respondent level, we aggregate this data to the county-year level for purposes of our analysis. We exclude counties whose adjusted FFS level-as of 2007-was above that of the lowest possible floor. Finally, we restrict to those counties within the 150-350k metro population band. We include a control for 2007 per capita Medicare FFS spending and include year-level indicators. We also include quadratic population controls, for counties as well as metros. Populations are stated in terms of 100k. Standard errors are clustered at the metro-level. Standardized treatment effects are calculated consistent with the approach in Kling et al (2007) and Finkelstein et al (2012). All specifications include controls for age categories, race, and gender.

Table A.10: Plan Financial Characteristics Results, Not Weighed by Enrollment

VARIABLES	(1) Premium	(2) OOPC	(3) Premium+OOPC	(4) Rebate	(5) Drug Coverage
Mean (Baseline Sample)	33.48	*354.36*	*392.71*	*49.55*	*0.664*
Urban	-7.292	-1.618	-8.910	7.857**	-0.115***
	(5.026)	(4.009)	(8.165)	(3.592)	(0.032)
2007 FFS 5yr (in 100s)	7.642***	4.407**	12.049***	-4.428***	0.050***
	(2.281)	(1.962)	(3.845)	(1.615)	(0.015)
N	1,728	1,728	1,728	1,728	1,728
Sample	*Baseline: 100-600k Metros, 2007-2011, 2007 FFS < 662*				
Urban	-4.132	-6.878	-11.011	6.669	-0.045
	(6.045)	(4.727)	(10.014)	(4.101)	(0.032)
2007 FFS 5yr (in 100s)	5.892*	3.302	9.193	-1.364	0.041*
	(3.497)	(3.138)	(6.082)	(2.751)	(0.024)
N	739	739	739	739	739
Sample	*Robustness: Narrower Bandwidth Sample (150-350k Metros)*				
Urban	3.991	-0.417	3.574	5.808	-0.026
	(7.035)	(5.265)	(11.795)	(5.444)	(0.041)
2007 FFS 5yr (in 100s)	5.294	4.987	10.281	-3.571	0.041
	(4.222)	(4.445)	(7.879)	(4.361)	(0.040)
N	386	386	386	386	386
Sample	*Robustness: Narrower Bandwidth Sample (200-300k Metros)*				
Urban	3.196	4.154	7.320	-3.964	-0.001
	(4.699)	(7.484)	(9.992)	(4.626)	(0.050)
2007 FFS 5yr (in 100s)	1.226	-1.525	-0.410	5.460*	0.008
	(2.569)	(3.538)	(5.572)	(3.09)	(0.011)
N	1,121	1,127	1,121	1,127	1,121
Sample	*Falsification: High FFS Cnty Sample (2007 FFS > 662)*				

Notes: Table presents linear regression models, where outcome variables are financial characteristics of MA plans. The unit of observation is aggregated at the county-year, for the 2007-2011 period, with the variables NOT weighed by plan enrollment. The original data is obtained from publicly available CMS files, including enrollment, landscape, OOPC, and other data. We exclude counties whose adjusted FFS level-as of 2007-was above that of the lowest possible floor. Finally, we restrict to those counties within the specified population band. Note that plan financial information only became available in 2000, meaning that our pre-period analysis only covers a single year. Further, note that plan rebates were only begun in 2006. We include year-level indicators and also control for 5-yr per capita Medicare FFS spending, from 2007. We also include quadratic population controls, for counties as well as metros. Populations are stated in terms of 100k. Standard errors are clustered at the metro-level.