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The unintended effects of the Medicare Part D low income subsidy

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ABSTRACT

Objectives: Medicare Part D is the voluntary program that provides insurance for prescription drugs to 37 million US elderly. This form of public insurance is delivered exclusively through a choice-based private insurance market, where Medicare pays various types of subsidies. The objective of this paper is to analyze how the subsidy paid to low income enrollees induces insurers to distort their plan premiums.
Methods: Combining both an analysis of the incentives created by the different regulations and empirical evidence obtained from plan level data for the years between 2006 and 2013, the paper evaluates the presence of premium distortions associated with insurers response to the low income subsidy.
Results: The findings indicate that insurers cluster premiums at the value that maximizes the rents they earn on enrollees receiving the low income subsidies. Moreover, insurers use the possibility of offering multiple insurance plans to manipulate the amount of the subsidy and increase further their rents.
Conclusions: This study indicates the need to reform the subsidy system in Medicare Part D and offers guidance on the essential elements of the low income subsidy reform.

1. Introduction

Medicare is a public health insurance program for the elderly and disabled in the United States that covers over 50 million beneficiaries. Medicare consists of several parts. Parts A and B cover hospital and outpatient services, respectively, under a fee-for-service model. Part C allows consumers to switch from fee-for-service to government-subsidized managed care administered by private insurers. Part D, introduced in 2006, is a voluntary program that provides insurance for prescription drugs.

In 2014, Part D had an enrollment of 37 million individuals and its cost for the government was estimated to be $75 billion. The distinguishing feature of this program is the delivery of insurance exclusively through a choice-based private insurance market. The public intervention is limited to paying subsidies and setting the rules under which the insurers operate. Hence, Part D is an important testing ground for how the government can regulate a publicly financed privately delivered health insurance program.

This paper focuses on the intended and, especially, the unintended effects of the Part D subsidies on insurer pricing strategies. In Part D, subsidies are in various forms and account, overall, for 90% of insurer revenues, while premiums paid by enrollees only constitute the remaining 10% of revenues [20]. This paper shows how the regulations

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involving the low income subsidy (LIS), which Medicare pays to plans enrolling beneficiaries of limited financial resources, might induce distortions in plan pricing choices. By linking together two parts of the regulation, that is the algorithm through which the LIS amount is calculated and the rule according to which low income enrollees are assigned to plans, I argue that insurers are capable of and do distort premiums. In particular, since Medicare pays the premium of low income enrollees in full as long as their premium is not higher than a threshold amount called the Low Income Premium Subsidy Amount (LIPSA), premiums can be increased up to the LIPSA without losing low income enrollees. Hence, for plans with a high share of LIS enrollees, insurers will try to forecast the LIPSA and set premiums equal to it. Furthermore, since the LIPSA is endogenously determined as a weighted average of plan premiums, a second type of distortion can result when insurers offering more than one plan use some of their plans to bolster the LIPSA. Using plan level data for the years between 2006 and 2013, I show evidence consistent with the presence of both types of distortions. I then conclude discussing the negative effects of premium distortions and some remedies.

This study contributes to a small but growing literature on the determinants of premiums in Part D. In particular, the idea presented in this paper is further developed in [4,5] to quantify the effect of the LIS-induced distortion on premium growth and consumer's welfare. Meanwhile, the current paper is concerned exclusively with establishing the presence of premium distortions and their evolution as regulations change between 2006 and 2013. The focus on supply side issues distinguishes this work from the majority of studies which focus on demand-side questions [1,11,14,10,15,19]. Finally, since Part D low income enrollees are mainly Medicare–Medicaid *dual eligibles*, this study contributes to the analysis of the mechanism used to provide drugs to this important population group [17,7,9,18].

2. Relevant regulations

In Part D, enrollees are divided into two groups, LIS receivers (35% of all enrollees) and "regular enrollees." LIS beneficiaries are the dual Medicare–Medicaid eligibles as well as certain institutionalized enrollees and enrollees with combination of assets and income below certain thresholds. Every year, regular enrollees choose a plan and pay its premium. In contrast, the Center for Medicare and Medicaid Services (CMS) randomly assigns LIS enrollees to plans where they are charged a zero premium. Premiums have a "basic component," meant to cover those drugs belonging tot he Part D formulary, and an "enhanced component," when additional drugs outside this formulary are offered. The LIS equals either the basic component of the plan premium or the LIPSA, whichever is less. The combined effect of the two rules described below is essential for the analysis of the effects of the LIS on premiums.

(1) *LIPSA calculation:* The LIPSA, the dollar amount of the LIS, is computed every year separately for each one of the 34 regions in which the US is divided. Its calculation involves several steps: The first step entails calculating premiums: Every year, insurers submit to CMS a *bid* for each of their Prescription Drug Plans (PDP) and Medicare Advantage Prescription Drug Plans (MA-PD). MA-PD provide Medicare Part A/B services in addition to the drugs of Part D, while PDP cover only drugs. The bid is the price requested by the insurer to enroll a beneficiary in its plan in the following year. This is *not* the premium. The premium is obtained by subtracting from the bid a "direct subsidy" which CMS calculates as (approximately) 65% of the average of all the bids submitted for that year (weighted by plans enrollment in the previous year). The second step entails calculating region-specific LIPSA as the average of the premiums in the region. The averaging method used from 2009 onward is a weighted average of the premiums' basic component with weights equal to plan shares of LIS enrollees. Before 2009, a hybrid system was used where, roughly, PDP were equally weighted, while MA-PD were enrollment-weighted [4].

(2) *LIS Enrollees Plan Assignment:* By default, LIS enrollees are randomly assigned by CMS to a PDP. The eligible plans for assignment are those without an enhanced component of the premium (called "basic plans") and with a premium no higher than the LIPSA. Although LIS beneficiaries can opt out of this auto-enrollment and choose any Part D plan, in 2010 only 30% of enrollees had opted out. These LIS enrollees, known as "choosers," might end up paying a positive premium, unless every year they self-enroll in an eligible plan.

An important feature of LIS enrollees assignments is that, if a plan eligible in a year t remains eligible into the following year $t+1$, it retains all the LIS enrollees it got assigned in period t. If it loses eligibility, however, CMS removes all previously assigned LIS enrollees. These enrollees are then reassigned at random among the eligible plans of that year, with one crucial exception. If the plan losing eligibility belongs to a multi-plan insurer with another eligible plan in the same region, then the random reassignment takes place within the eligible plans of the same insurer. From 2001, a newer regulation known as "meaningful difference" limited, but not eliminated, the presence of multi-plan firms by requiring that no more than two "enhanced" plans and at most one "basic" plan could be offered per brand.

Finally, it is important to stress that although LIS enrollees consume more drugs than regular enrollees, various provisions (the "three R's:" risk adjustment, reinsurance and risk corridors) limit insurer costs for high-consumption enrollees. First, CMS risk adjusts the direct subsidy so that plans with higher risk enrollees are paid more. An additional risk adjustment factor increases the payments for plans enrolling LIS enrollees. Second, CMS pays insurers the "catastrophic subsidy" which covers 80% of enrollees expenditures above (approximately) $6500. Third, at the end of every year, plans either pay or receive a transfer from CMS depending on how much their profits/losses exceed a risk corridor.

3. Expected effects of the LIS regulations

Insurers can submit a single *bid* per plan that cannot be made conditional on the LIS status of the enrollee. Thus, the simultaneous presence of both regular and LIS enrollees requires that, to discuss the impact of LIS regulations, a more general framework premium determinants be presented first. To simplify, I will consider three sets of premium determinants – cost, demand and competition – and briefly describe their interaction with the LIS regulations.

First, premiums are linked to insurer costs. Since drug prices are likely to be the main cost driver [6,16], have analyzed them showing that insurers have been effective in bargaining lower prices with insurers by leveraging their increased customer base under Part D and their ability to increase substitutability between drugs, due to the use of drug formularies. A relevant aspect for this study is that, since most of the drug costs for LIS enrollees is paid by Medicare and not by insurers, differences in drug costs between insurers might induce heterogeneity, with some insurers specializing in LIS enrollees.

Second, various demand features might affect premiums. Enrollees consuming more drugs self select into more generous plans [19,12]. The "three R's" system mitigates adverse selection, but, specifically for LIS enrollees [13], documented that the amount of the extra readjustment for LIS enrollees (8% before 2011) was insufficient and provided a justification for the upward revision that occurred in 2011. Consumer self selection, however, can also lead to greater profits when Medicare incorrectly associates diagnosis-specific reimbursements with their costs for insurers. [2] documents the misalignments of the reimbursement formula used before 2011 and how this lead to cream-skimming by insurers. Finally, the presence of inertia in plan choices has been shown by [8] to be an important feature of this market leading certain insurers to drive up their premiums over time. Third, the extent of insurer competition affects premiums [3]: find that a larger number of plan sponsors in a region is associated with lower bids. Both [3], that focuses on the period 2006–2010, and [4], that focuses on the period 2006–2011, argue that competition was likely softened due to the provisions for LIS enrollees. Indeed, two main types of pricing distortions are likely caused by the LIS regulations. First, the default assignment makes LIS enrollees infinitely inelastic to premium changes up until the point where the premium equals the LIPSA. After this threshold, however, they immediately move to a different plan. To see how this discontinuity affects pricing choices, consider the case of a plan enrolling only LIS beneficiaries. Any price below the LIPSA will be suboptimal because, by increasing the premium up to the LIPSA, the profit earned on each enrollee increases and no enrollee leaves the plan. Similarly, a price just above the LIPSA is unlikely to be optimal since lowering the price to the LIPSA can substantially increase the market share. On the other hand, however, the previous discussion suggests that LIS enrollees might be more costly to ensure given the imperfect risk adjustment and the impossibility of cream skimming. This creates a cost discontinuity at the LIPSA that could induce certain insurers to price strictly above the LIPSA. Thus, it is for those plans enrolling mostly LIS receiver that we expect a tendency to increase prices toward the LIPSA.

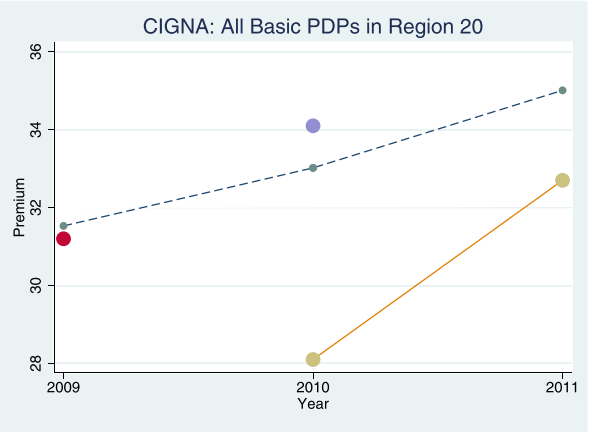

Fig. 1. CIGNA basic plans 2009–2011 – Region 20 (Mississippi). Small dots: LIPSA values. Large dots: premiums, with different colors indicating different plans. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

The second and more subtle type of distortion is the one driven by how the LIS calculation method interacts with the random assignment provision. Fundamental to this distortion is the fact that insurers offer multiple plans in each market. A multiplan insurer can use some of its plans to increase the LIPSA, while placing its other plans right at the LIPSA to capture LIS enrollees. This distortion can be formally shown to emerge as the equilibrium outcome of a pricing game between insurers [4]. Thus, we shall find that multiplan firms in addition to clustering some of their plans at the LIPSA also set particularly high premiums for their other plans having a larger weight in the LIPSA calculation. In any period t, these high premium plans should be the ones priced low in $t-1$ because this allows them to get LIS enrollees in period $t-1$ and enter period t with a high weight for the LIPSA calculation.

An example concerning CIGNA (one of the seven largest insurers in Part D) will clarify what type of strategies are compatible with LIPSA manipulations. Fig. 1 reports the LIPSA of region 20 (Mississippi) for the years 2009–2011 as well as the premium of CIGNA's basic PDP. In 2009 CIGNA had only one plan in this region and 96% of its 14,310 enrollees were LIS receivers. In 2010, two new plans, one "cheap" ($28.1 premium) and one "expensive" ($34.1), were introduced and the old plan was consolidated into the *expensive* plan. CIGNA's decision to transfer all LIS enrollees into the $34.1 plan might seem surprising, especially since the 2009 LIPSA was less than $32. However, this choice maximized its positive influence on the LIPSA: Its expensive plan had a weight of 8% (inherited from the consolidated plan), while its cheap plan had a weight of 0%. Once the LIPSA was calculated, the premium of the expensive plan was above the LIPSA and so this plan lost its subsidized enrollees. But none of them were lost by CIGNA itself because they were reassigned to its cheap plan and Medicare paid the premium of this cheap plan for all LIS enrollees. However, had CIGNA consolidated the old plan

Table 1
Summary statistics.

Statistics by Plan, 2006–2013								
	Basic PDP				Enhanced PDP			
	Mean	SD	p50	*N*	Mean	SD	p50	*N*
Basic premium	33.04	10.19	31.95	5467	39.02	18.00	36.20	4858
Total premium	33.04	10.19	31.95	5467	57.24	24.63	50.70	4858
Deductible	218.2	120.7	275	5467	17.62	50.07	0	4858
Tot. enrollment	17,877	34,461	5388	5467	6131	16,324	1545	4858
LIS enrollment	10,394	19,922	2944	5467	655.3	2375	166	4858
Unrestricted A.I.	426.7	130.3	416	5467	402.8	114.5	400	4858
Top 100 A.I.	66.98	18.08	70	5467	64.08	17.89	66	4858
Drugs	0.806	0.124	0.818	5467	0.844	0.119	0.845	4858
Pharmacy netw.	57,789	16,216	62,045	5467	57,510	16,554	62,280	4858

Sample of PDP offered in 2006–2013. "Unrestricted A.I." – number of active ingredients covered without any usage restriction. "Top 100 A.I." – number of covered active ingredients under tier 1 or 2 out of the 100 most frequently purchased active ingredients. "Drugs" – number of drugs in the formulary. "Pharmacy netw." – number of in-network pharmacies.

directly into the cheap plan, the LIPSA would have been 2% lower (holding all other premiums fixed).

This suggests that LIPSA manipulations are likely associated with abrupt premium changes over time. I will refer to this type of behavior as "active distortion" because it actively tries to increase the LIPSA, while I will define the simple clustering at the LIPSA as "passive distortion" to indicate that it can result from taking the LIPSA value as given. The following analysis presents evidence on both distortions. The earlier considerations on other premium determinants have two main implications: First, the price cycles due to LIPSA manipulation shall be distinguished from those associated with consumer inertia. Second, the regulatory periods 2006–2010 and 2011–2013 shall be considered separately due to the changes in both the cost LIS beneficiaries relative to regular enrollees (via the updates to the risk adjustment formula) and LIPSA manipulability (via the "meaningful difference" rule).

4. Data and method

This study uses publicly available data released by CMS describing enrollment and plan features for all plans offered between 2006 and 2013. These plan-level data allow us to observe enrollment and several plan characteristics, like the basic and enhanced components of the premium, the type of PDP and MA plan, the deductible, the type of coverage in the gap, the identity of the insurer, the drug formulary and the pharmacy network. Insurers are required to offer different plans across the 34 geographical regions even if the plan characteristics are identical. Table 1 reports summary statistics for the sample of PDP, separately for basic and enhanced PDP. LIS enrollees are present in both groups of plans, but they are particularly concentrated in basic PDP. In these data, 70 distinct insurers offer at least one PDP. However, by looking at total enrollment into PDP in 2011, only 7 firms have a market share of at least 3%. They are: United Health, Humana, Universal American, CVS Caremark, Coventry, WellCare and CIGNA (in decreasing order of enrollment share). A key feature of the data regards the concentration of the plan weights used to calculate the direct and low-income subsidies and how their concentration increased after 2008: no plan has more than a 2% weight on the direct subsidy, while for the LIPSA the 5 highest weights range between 12% and 20% for 2007–2008 and between 50% and 64% for 2007–2013. This suggests that the LIS is more easily manipulable relative to the direct subsidy.

I assess the presence of active and passive premium distortions through descriptive empirical analyses. For the passive distortion, I rely on a graphical analysis to show clustering of premiums at the LIPSA. As regards the active distortion, I present a regression analysis relating changes in plan premiums over time to measures of the incentive to manipulate the LIPSA. Drastically increasing the price of a plan is a profitable method to exploit the LIPSA manipulability only if the firm that follows this strategy has both a high LIPSA weight and some eligible plan to absorb LIS enrollees. Therefore, I construct a dummy variable (*Premium_Jump*) to identify the instances when a plan premium drastically changes relative to the year before and estimate a probit model to find how the probability of drastic premium changes depends on three main factors: (i) the firm LIPSA weight (*wLIS_Firm*), (ii) a dummy recording whether the firm offers multiple plans, at least one of which is eligible for LIS enrollees (*Eligible_Firm*) and (iii) the interaction between the previous two variables. Formally, I estimate the probit model: $Pr(Premium\_Jump_{ijt}) = \Phi[\alpha + \beta_1(wLIS\_Firm_{ijt}) + \beta_2(Eligible\_Firm_{ijt}) + \beta_3(wLIS\_Firm_{ijt}) * (Eligible\_Firm_{ijt}) + \gamma X_{ijt} + \tau_t + \lambda_j + f_i]$, where i indexes the plan, j the region and t the year. Φ is the CDF of the unit-normal distribution. The main coefficient of interest is β_3. The regressions also include dummy variables to control for years, τ_t, regions, λ_j, and the identity of the 20 largest firms, f_i. The matrix X_{ijt} contains additional covariates and it differs across the specifications analyzed.

To assess the reliability of the baseline regressions, I present results using different sets of additional covariates. I control for both plan generosity measures and for proxies of the incentive to exploit inertia via premium changes. I also perform a placebo analysis in which the firm market share of regular enrollees replaces the LIPSA weight both as a control and as an element of the interaction term. Moreover, I compare the estimates obtained for the sample period 2006–2010 with those for 2011–2013 since price

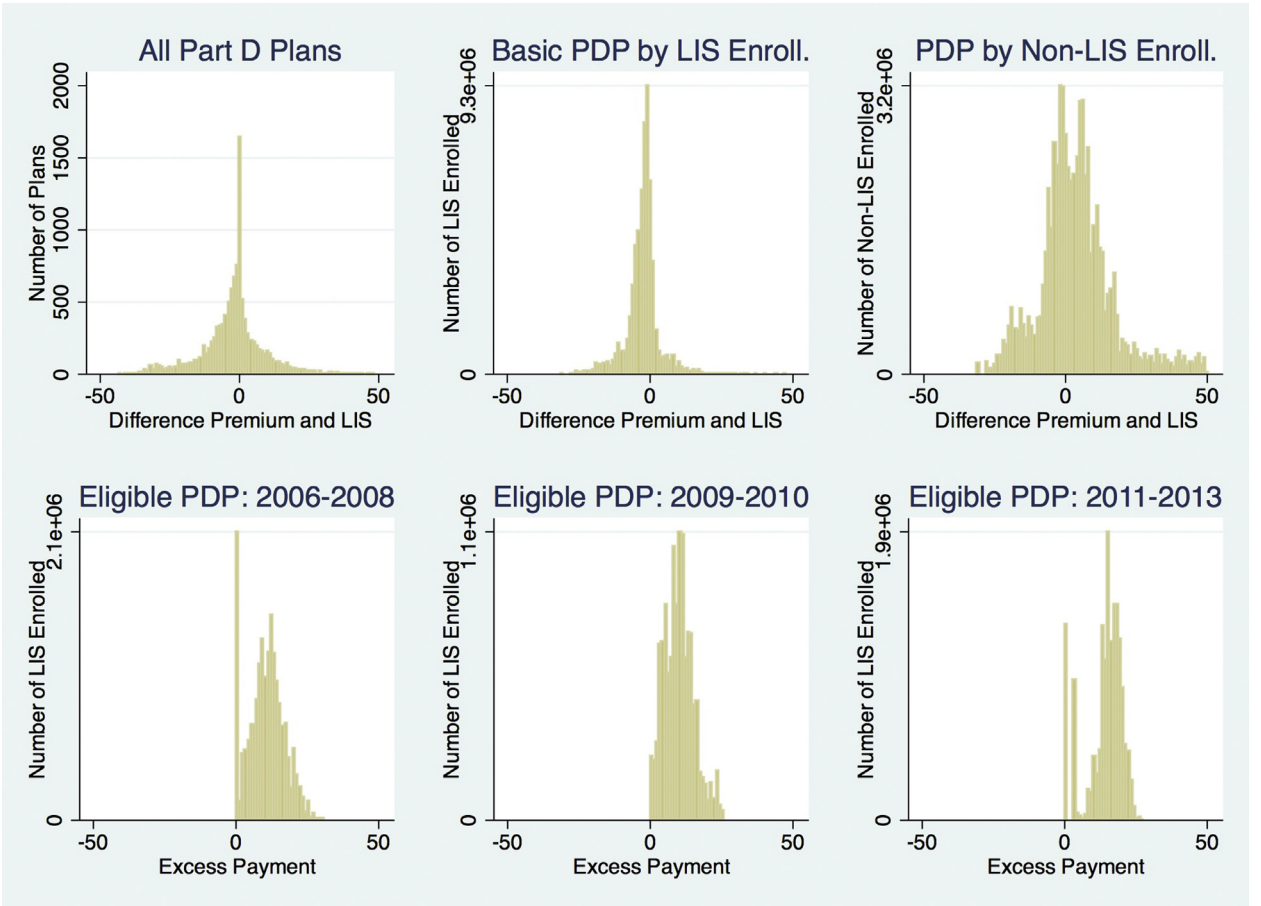

Fig. 2. Passive distortion of plan premiums. Top row – histograms for the difference between premium and the LIPSA for 2006–2013 for there cases: all plans (left); basic PDP, weighted by LIS enrollment (center): all PDP, weighted by non-LIS enrollment. Bottom row – histograms for eligible PDP reporting the difference between premium and the cheapest eligible PDP, weighted by LIS enrollment.

cycles are less likely to happen in this latter period. For this latter period, I supplement the regression analysis with a discussion of more sophisticated active distortion strategies based on switching the enhanced/basic plan status.

5. Results

(1) Passive distortion: Fig. 2 reports four histograms that illustrate premiums concentration at the LIPSA. The top-left plot reports the difference between premium and the LIPSA for all plans. The absolute frequency of plans that are within $1 below the LIPSA is twice that of plans that are between $1 and $2 below the LIPSA and three times that of plans that are within $1 above the LIPSA. No other bin in the histogram has a similar abrupt increase in its frequency. The next two plots show a similar pattern for two subgroups of plans: basic PDP, weighted by their LIS enrollees (top-center plot) and all PDP, weighted by regular enrollees (top-right plot). Clustering near the LIPSA is a major feature of the data.

The following three plots show a measure of the potential waste: They restrict the analysis to eligible PDP and show that for most LIS enrollees there is a positive and large (typically between $10 and $20) difference between their premium and cheapest basic PDP in the region. Unless insurers readjusted premiums over time to be right at the LIPSA, random reassignment, together with the weighted average LISPA calculation method, should mechanically lead to the convergence of LIS enrollees into the cheapest basic PDP. The comparison of the histograms shows that, although the 2011 reforms partially succeeded in moving of a large number of LIS enrollees into the cheapest PDP, many remain enrolled in expensive PDP.

(2) Active distortion: Table 2 reports the results from the probit analysis. The dependent variable in models [1]–[3] and [7]–[9] is a dummy that equals one if there is a premium increase of at least 75%. In models [4]–[6] and [10]–[12] it equals one if the premium declines by at least 40%. The main part of this analysis focuses on 2007–2010 realizations of the premium change variables. The estimates for models [1] and [4] are the baseline estimates. The following two sets of estimates for models [2] and [5] extend the specification to include additional controls, while models [3] and [6] replace the continuous variable measuring the firm LIS weight with a dummy for high weight plans.

Both upward and downward premium changes are significantly associated with the interaction between a firm's LIPSA weight and LIS eligibility, although not in all specifications. Moreover, the positive sign estimated for models

Table 2
Regressions for large changes of plan premiums.

Dependent var.	Increase over +75%			Decline over −40%			Increase over +75%			Decline over −40%		
Model	Baseline [1]	Controls [2]	Dummy [3]	Baseline [4]	Controls [5]	Dummy [6]	M.S. control [7]	Placebo [8]	Post 2010 [9]	M.S. control [10]	Placebo [11]	Post 2010 [12]
(*wLIS_Firm*)*(LIS eligible firm)	0.198** (0.078)	0.188** (0.075)	0.057* (0.032)	−0.275(0.224)	−0.303(0.225)	−0.016** (0.008)	0.175** (0.076)		−0.011(0.021)	−0.271(0.219)		0.256*** (0.065)
wLIS_Firm	0.094** (0.039)	0.080** (0.039)	0.016** (0.007)	−0.196*** (0.045)	−0.132*** (0.039)	−0.011** (0.005)	0.003 (0.038)		0.011 (0.008)	−0.174*** (0.047)		−0.163*** (0.054)
LIS eligible firm	−0.013(0.009)	−0.014* (0.008)	−0.015* (0.009)	0.018 (0.018)	0.045* (0.027)	0.028 (0.017)	−0.012(0.008)	−0.012(0.009)	0.023 (0.024)	0.018 (0.018)	0.003 (0.011)	−0.022*** (0.008)
Solo basic PDP		−0.016** (0.007)	−0.017** (0.007)		0.107*** (0.027)	0.119*** (0.028)						
Plan age		−0.004(0.003)	−0.003(0.003)		−0.025*** (0.004)	−0.028*** (0.003)						
Drugs		0.054 (0.045)	0.048 (0.043)		0.069*** (0.022)	0.076*** (0.024)						
Pharmacy netw.		0.538 (0.347)	0.457 (0.342)		−0.212*** (0.062)	−0.239*** (0.064)						
(Mkt share)*(LIS eligible firm)							0.025 (0.050)			−0.134(0.104)		
Mkt share							0.179*** (0.031)	0.193*** (0.036)		−0.039(0.034)	−0.076* (0.040)	
Observations	4581	4581	4581	4400	4400	4400	4581	5071	2211	4400	4758	678

Probit marginal effects and standard errors (clustered by region, year and insurer). All regressions include dummy variables for: regions, years, the identity of the 20 largest insurers, enhanced plans and the first year the plan was offered. The sample years are 2010–2013 for [9] and [12] and 2007–2010 for all other cases. The number of pharmacies is divided by 10,000.

* $p<0.1$.
** $p<0.05$.
*** $p<0.01$.

[1]–[3] and the negative sign estimated for model [4]–[6] support the hypothesis that when an insurer can gain from a higher LIPSA, positive jumps are more likely and negative jumps less likely. Among the additional controls, I include a control for whether the plan is the only basic PDP offered in a market where the insurer was not eligible in the previous year (*Solo Basic PDP* in the table). Consistent with firms adjusting premiums to be eligible for LIS enrollees, such plans are unlikely to experience positive jumps, but likely to experience negative ones.

Although it is the sign of the estimates to be of particular interest, the estimates from models [3] and [6] are useful to interpret magnitudes. In model [3], for an insurer that is LIS-eligible a switch from being a below-average LIS weight to an above-average LIS weight insurer increases the probability of a positive jump by 0.06, which is also exactly the sample average of the dependent variable. The effects of these price jumps on market shares reveal an interesting heterogeneity across insurers. Humana and Universal, the firms exhibiting the largest number of jumps, are typically described as being interested respectively in exploiting either consumers' inertia (Humana [8]) or LIS enrollees (Universal [4]). Indeed, over the sample period the share enrollees who are LIS remain stable at around 70% for Universal, while it declines from 25% to 10% for Humana.

All specifications in Table 2 include dummy variables for the first year in which the plan was offered to control for consumers' inertia [8]. As an additional control, models [2] and [5] report estimates including the number of years since the plan was first offered. [7]–[12] explore the robustness to inertia along two different lines. First, models [7] and [10] control for the firm (one period lagged) market share of regular enrollees in the region: Qualitatively the findings are not affected. Models [8] and [11] report a placebo analysis in which the firm market share of regular enrollees replaces the LIPSA weight both as a control and as an element of the interaction term. The estimates indicate that this interaction term has a smaller magnitude and is not significant. Hence, although the market share of regular enrollees is associated with premium changes, its effect is different from that of the LIPSA weight and unrelated to active distortions. Finally, [9] and [12] repeat the analysis using the 2011–2013 sample. Consistent with the idea of a change in the type of distortion created by the regulation changes, high-weight LIS-eligible insurers are not anymore likely to exhibit positive jumps and, on the contrary become more likely to exhibit negative jumps.

(3) Active distortions after 2010: Outright premium manipulations face two main constraints after 2010. First, CMS supervision over the market became tighter. Enforcement actions (ranging from money penalties to immediate suspension of enrollment or even plan termination) became particularly common only starting from 2010: 9 actions were taken before 2010, while 91 actions took place between then and September 30th, 2014, with 32 of them occurring within the first 9 months of 2014. Second, active manipulations are harder under the cap on the number of plans established by the "meaningful difference" rule. Since LIS enrollees can be reassigned only to basic plans, at first glance the "meaningful difference rule

seems to resolve the perverse incentive to manipulate the LIPSA.

Nevertheless, sophisticated strategies can be used to circumvent these limits. First, the new cap on the number of plans is at the brand-level, while reassignments are at insurer level. Possibly, this explains why after 2011 a few insurers have started to increase the number of their brands. For instance, although CIGNA completed its acquisition of Health Spring by January 2012, its offering for 2013 entailed basic PDPs under the two brands Cigna Medicare Rx and HealthSpring Prescription.

Second, insurers offering both enhanced and basic plans can still manipulate the LIS by switching the plan-type. The basic plan that in $t-1$ enrolls subsidized enrollees is converted to enhanced in t and its premium is set as high as possible. The other plan that was enhanced in $t-1$ is converted to basic in t and its premium is set at the LIPSA. Interestingly, for 2013 in 30 regions the largest Part D insurer, UHG, switched all the basic plans it offered in 2012 (that enrolled about 4 million people in total, 9 million of which were LIS receivers) to enhanced plans and increased their premiums, while at the same time in all these regions it introduced new basic plans at a lower price.

6. Conclusions

The evidence presented in this study reveals that the LIS regulations are associated with premium distortions. The natural question is then: What is the extent of harm from these distortions? Although a detailed answer is beyond the scope of this paper, there are at least two motives why premium distortion should be a major concern. First, one of the main pillars of a choice-based insurance market is that prices must guide consumers to make the best choice. This, in turn, is a pre-requisite for a second pillar of the system, i.e., competition between insurers. Therefore, a systematic distortion like that evidenced by the clustering at the LIPSA represents a threat for the correct functioning of the program. The second motive, instead, is that the type of active distortion described here puts an upward pressure on premiums and subsidies causing the cost of the program to increase for both Medicare and the consumers. Indeed, the growing cost of this program has been a relevant concern and the LIS distortions are likely a relevant part of the explanation.

Any effective reform of the LIS regulations must address the LIS manipulability. This could entail: (i) diluting the weight that each plan exercises on the calculation of the low income subsidy, (ii) using historical cost data, instead of current bids, for the LIS calculation, (iii) setting a fixed amount for this subsidy and (iv) mandating insurers to offer a single plan, but without the exceptions allowed under the *meaningful difference* regulation. Overall, this analysis suggests that an effective reform should focus on limiting the number of choices that are left to insurers in terms of plans design and, more generally, it stresses the difficulties of a careful design of the supply side incentives in public programs delivered through private insurance markets.

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