From: McGyver Scott Clark
To: Professor Paul Eliason
Date: June 13, 2022
Re: 2010 Competitive Bidding Program and Medicare Reimbursements on Durable Medical Equipment

MEMORANDUM

Objective

The purpose of the following memo is to analyze the effect that the Competitive Bidding Program (CBP) had on Medicare reimbursements for durable medical equipment (DME). The CBP was put in place in the year 2011 had was rolled out to 72 unique counties in the United States. The data used for this analysis comes from The Dartmouth Atlas that provides data on Medicare expenditures by geographies over time.[1]

Context

Medicare is the U.S. federal health insurance program for people aged 65 years or older and people with certain disabilities. Medicare is the second largest program in the federal budget, comprising representing approximately 12% of total federal spending.[2] Durable Medical Equipment includes products such as Blood Sugar Meters, Crutches, CPAP Machine, Oxygen Equipment, etc. DME, though the smallest categorical reimbursement of Medicare since 2014, remains a substantial payout of the federal budget.[3]

The Competitive Billing Program was instated with the goal to decrease the total expenditure for DME to rates that reflected a competitive landscape. CBP requires that Medicare replace the current fee schedule payment methodology for DME with a competitive bid process. Under CBP, a competition among suppliers in a particular area is held through an electronic bidding process for the awarding of contracts to supply such equipment to Medicare.[4] The CBP was applied to 72 different unique counties in the United States.

The questions stand, after having the CBP program in effect for 10 years now, whether it was effective in decreasing the rates for DME products down to competitive levels. This question is not only important for future expenditures on DME, but also has implications for other Medicare expenditure categories such as reimbursements for Hospice, Skilled Nurse, and other healthcare facilities.

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1. *Medicare reimbursements*. Dartmouth Atlas DATA. (2022, February 3). Retrieved June 13, 2022, from https://data.dartmouthatlas.org/medicare-reimbursements/
2. *Budget basics: Medicare*. Peter G. Peterson Foundation. (2021, September 2). Retrieved June 13, 2022, from https://www.pgpf.org/budget-basics/medicare
3. *Figure 1* – Page 4
4. DME CBP Education. (n.d.). Retrieved June 13, 2022, from https://www.dmecbpeducation.com/

Methods

To explore this question, a Difference in Difference regression model controlling for time trends was used to explore the efficacy of the CBP program and its causal effect on the Medicare DME rates.[5] The proposed regression model to be used is as follows:

$$\text{Adjusted DME Rate}_{it} = \beta_0 + \beta_1 CBP_i + \beta_2 POST_t + \delta(CBP_i * POST_t) + \theta Year_t + \varepsilon_{it}$$

With this model, we will be able to control for time trends prior to the CBP program being instated, time trends after, control for geographic area and explore the effect of the CBP program on the chosen geographic areas. For this model, we have assumed that the selection of geographic areas was randomized, that the time trend of reimbursement rates was parallel prior to 2010, and that we have controlled for all issues of linearity, multicollinearity, and heteroskedasticity.[6] The following is the proposed model:

$$\text{Adjusted DME Rate}_{it} = 5{,}307.54 + 16.89(CBP_i) - 30.68(POST_t) - 14.46(CBP_i * POST_t) - 2.51(Year_t) + \varepsilon_{it}$$

Analysis

There is strong evidence to suggest that the CBP program was effective in decreasing Medicare Reimbursement for DME products. We also saw a general time trend showing that after the CBP program had rolled out, there were other factors that caused the price of DME to decrease as well. [7]

For untreated counties, before 2010, the average price of DME reimbursement was $268.40, and after 2010 to present, the average has decreased to $216.38. For Treated counties, the price decrease was greater, with a change of $285.30 to $218.81. Therefore, the regression results predict that the effect on DME prices on CBP treated counties was greater that the control untreated counties. Even though both pre and post program averages of the untreated group is higher, the sample size of the untreated group is much larger with ~24,000 observations, but only ~500 observations of the treated group.[8,9] Therefore, there is strong evidence that the CBP was effective in decreasing the price of DME in the counties that were treated significantly and that it was effective in reaching its goal.

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5. *Difference-in-differences*. Dimewiki. (n.d.). Retrieved June 13, 2022, from https://dimewiki.worldbank.org/Difference-in-Differences
6. *Figure 5 – page 5*
7. *Figure 2 – page 4*
8. *Figure 3 – page 5*
9. *Figure 4 – page 5*

A restraint that this model could have is if the insights found are able to be extrapolated to the entire United States. It will be interesting as the CBP is rolled out in more counties how it will affect their DME prices. With such a large sample of years and observations in different counties, there is strong evidence to suggest that the conclusion the CBP is effective at decreasing Medicare Reimbursements for DME in the counties tested will also be true for the counties that have not been treated with the program. Only time will tell, but I do not expect any significant difference to emerge.

Conclusion

There is strong evidence to suggest that the Coappetitive Bidding Program had a causal effect on Medicare reimbursement rates on Durable Medical Equipment. This suggests that not only was this policy effective, but also presents a template for future legislation as private sector companies compete for government contracts and as we continue to cultivate a competitive landscape in the private sector, that we will see an overall decrease in price points across industries, increased innovation, and increased consumer welfare.

Visual Figures

Figure 1 – Average Annual Reimbursement Rate by Category

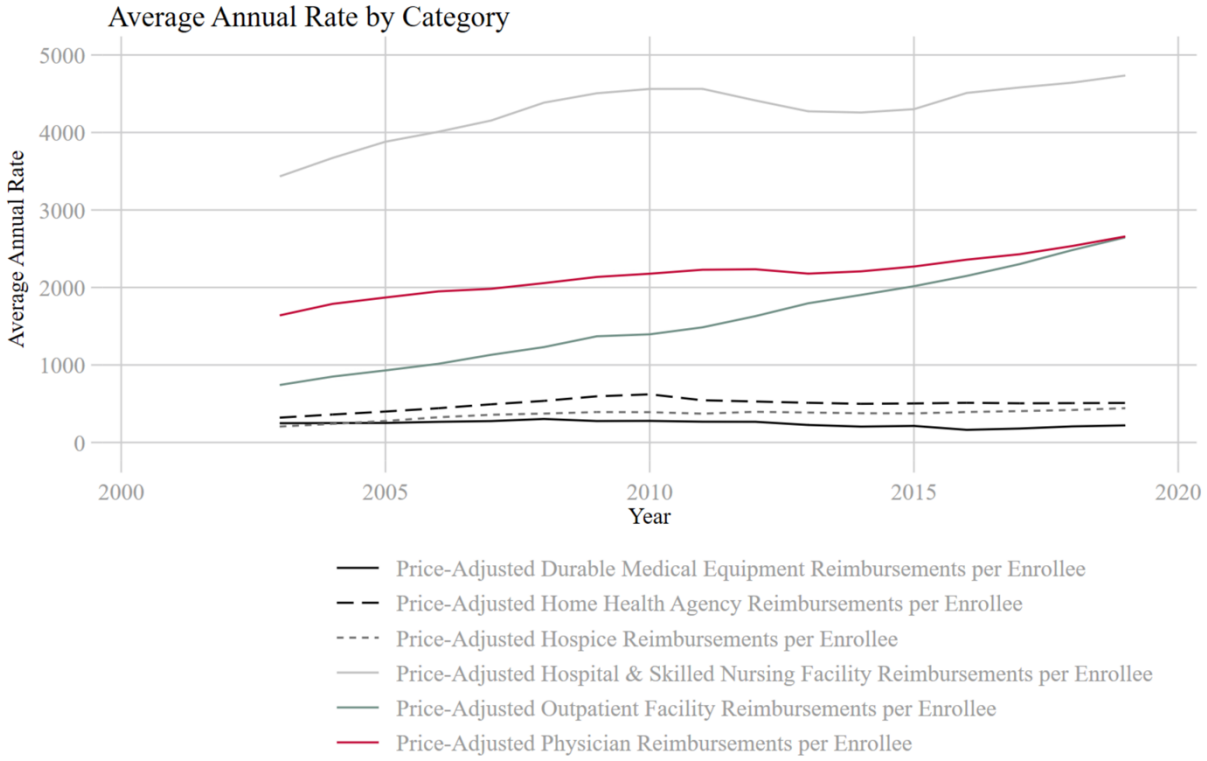
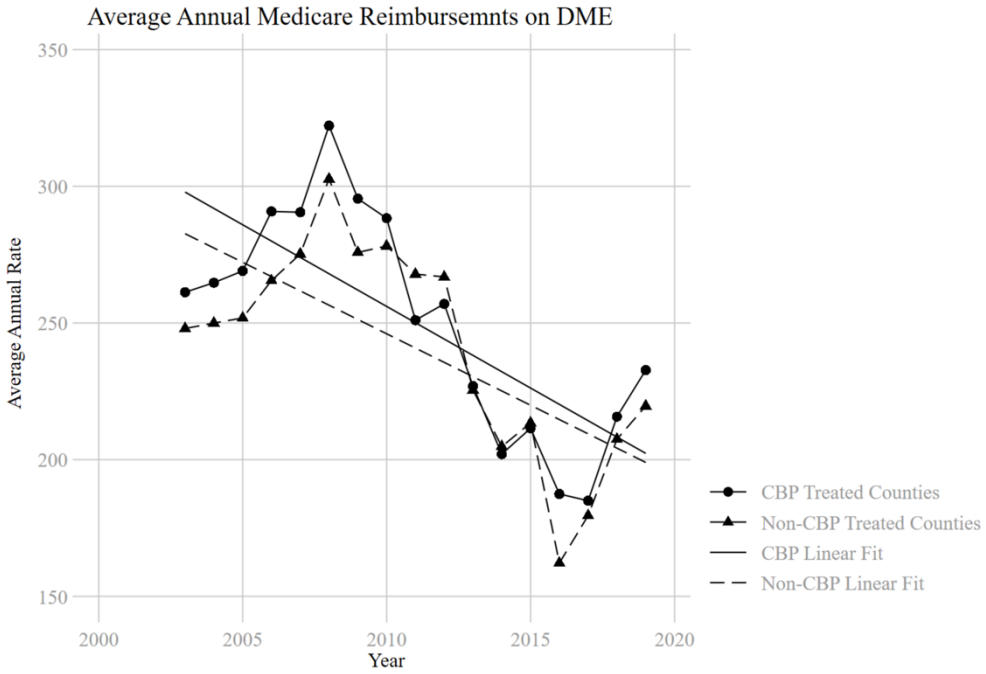


Figure 2 – Comparison of Treated and Non-Treated Counties from 2003 to 2019



Data Tables

Figure 3 – Summary Statistics for Non-CBP Treated Counties on DME Reimbursements

Time Range	Obs	Mean	St. Dev.	Min	Max
Before 2011	24063	268.4	91.6	34.84	2634.06
Post 2011	27591	216.38	68.65	14.76	2670.41
Change		-52.02	-22.95	-20.08	36.35

Figure 4 – Summary Statistics for CBP Treated Counties on DME Reimbursements

Time Range	Obs	Mean	St. Dev.	Min	Max
Before 2011	576	285.3	111.3	136.68	1410.45
Post 2011	648	218.8155	44.38	96.47	421.94
Change		-66.4845	-66.92	-40.21	-988.51

Figure 5 – Difference in Difference Regression Summary Statistics

Summary Statistics	Output
Number of Observations	52,878
F(4, 52873)	1444.26
Prob > F	0.000
R-Squared	0.1015
Root MSE	79.992

Figure 6 – Difference in Difference Regression Coefficient Summary

Adjusted Rate	Coefficient	Robust Std. Err.	t	P>t	[95% Conf.	Interval]
CBP	16.89	4.71	3.59	0.000	7.66	26.12
Post	-30.68	1.41	-21.69	0.000	-33.45	-27.91
CBP_Post	-14.46	5.01	-2.88	0.004	-24.29	-4.62
year	-2.51	0.14	-17.86	0.000	-2.79	-2.24
_cons	5307.54	282.16	18.81	0.000	4754.51	5860.57