

Peering Behind the Veil: Trends in Types of Contracts between Private Health Plans and Hospitals

APPENDIX TABLES

Appendix Table 1. Claims by Contract Type for Algorithm

Year	Analysis Sample: Private Health Plans						Validation Sample: Medicare FFS						Validation Sample: Medicaid FFS					
	Total Claims (1000s)	Classifiable Claims (1000s)	Contract Type (% of classifiable claims)				Total Claims (1000s)	Classifiable Claims (1000s)	Contract Type (% of classifiable claims)				Total Claims (1000s)	Classifiable Claims (1000s)	Contract Type (% of classifiable claims)			
			Dis-count	Fixed	Per Diem	Tie (Not Classified)			Dis-count	Fixed	Per Diem	Tie (Not Classified)			Dis-count	Fixed	Per Diem	Tie (Not Classified)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	
2009	16.3	8.4	54.6	11.6	32.3	1.4	-	-	-	-	-	42.3	37.0	11.5	84.0	4.5	0.1	
2010	14.4	7.1	53.0	13.4	32.7	0.9	-	-	-	-	-	44.1	38.3	11.7	84.0	4.1	0.2	
2011	19.5	12.5	49.7	27.5	21.9	0.9	-	-	-	-	-	43.5	37.5	14.1	80.2	5.5	0.1	
2012	27.9	20.5	47.1	30.2	22.0	0.8	-	-	-	-	-	43.3	37.2	12.5	83.1	4.2	0.3	
2013	30.2	22.2	40.1	37.8	21.7	0.5	-	-	-	-	-	44.4	38.2	17.4	79.0	3.4	0.2	
2014	30.9	21.9	28.6	43.8	27.1	0.5	101.0	90.9	5.3	89.1	5.3	0.3	51.8	44.5	18.3	73.4	8.1	0.2
Total	139.1	92.5	42.5	31.9	24.9	0.7	101.0	90.9	5.3	89.1	5.3	0.3	269.4	232.6	14.4	80.4	5.0	0.2

SOURCE Authors' analysis of CO APCD data for January 2009-December 2014 and MEDPAR's Colorado Medicare Fee-For-Service claims for January 2014-December 2014

NOTES Classifiable claims indicate that they are from quads with at least 3 claims, which is a requirement of our algorithm, as described in the methods section. Among classifiable claims, the percentages denote the fraction of claims our algorithm classifies as discounted charge, fixed rate, per diem, or (in case of an exact tie among CVs) not classified.

Appendix Table 2. Patient Characteristics

Analysis Sample: Private Health Plans							
Age	2009	2010	2011	2012	2013	2014	Total
0-17	14.0%	15.5%	18.1%	20.7%	20.2%	17.8%	18.3%
18-24	6.9%	5.5%	6.3%	6.2%	6.0%	5.4%	6.0%
25-34	24.5%	24.3%	23.7%	24.3%	24.8%	26.8%	24.9%
35-44	16.1%	16.3%	14.6%	13.8%	14.6%	15.3%	14.9%
45-54	17.1%	16.8%	15.1%	13.4%	12.9%	12.6%	14.1%
<65	21.5%	21.6%	22.3%	21.6%	21.5%	22.1%	21.8%
Sex							
Female	67.2%	66.2%	67.2%	66.9%	66.7%	68.2%	67.2%
Male	32.8%	33.8%	32.8%	33.1%	33.3%	31.8%	32.8%
Validation Sample: Medicare FFS							
Medicare FFS	-						
Age	2009	2010	2011	2012	2013	2014	Total
<45	-	-	-	-	-	4.1%	4.1%
45-64	-	-	-	-	-	14.7%	14.7%
65-74	-	-	-	-	-	33.8%	33.8%
75-84	-	-	-	-	-	27.8%	27.8%
85 and over	-	-	-	-	-	19.5%	19.5%
Sex							
Female	-	-	-	-	-	53.8%	53.8%
Male	-	-	-	-	-	46.2%	46.2%
Validation Sample: Medicaid FFS							
Age	2009	2010	2011	2012	2013	2014	Total
0-17	20.1%	20.0%	18.9%	17.9%	16.4%	13.9%	17.7%
18-24	28.2%	26.3%	24.4%	22.9%	21.2%	18.4%	23.4%
25-34	27.4%	28.0%	28.7%	28.5%	29.4%	26.4%	28.0%
35-44	10.5%	10.8%	12.0%	12.6%	13.6%	13.9%	12.3%
45-54	6.6%	7.4%	8.0%	9.1%	9.5%	13.4%	9.1%
<65	7.1%	7.5%	8.1%	9.1%	9.9%	14.1%	9.4%
Sex							
Female	80.6%	79.6%	78.7%	77.0%	76.2%	70.3%	76.9%
Male	19.4%	20.4%	21.3%	23.0%	23.8%	29.7%	23.1%

SOURCE Authors' analysis of CO APCD data for January 2009-December 2014 and MEDPAR's Colorado Medicare Fee-For-Service claims for January 2014-December 2014.

NOTES This table shows descriptive statistics for our hospital inpatient sample. The age is member age at the time of service provided. The percentage represents the proportion of claims by each age group and sex after exclusion restrictions are applied.

Appendix Table 3-a. Contract Types by MS-DRG for Top 10 Clinical Conditions-Analysis Sample: Private Health Plans

	MS DRG Descriptions (corresponding MS-DRGs)	Total Spending (in millions of dollars) (1)	Classifiable Spending (in millions of dollars) (2)	Classification			
				Discount (3)	Fixed (4)	Per Diem (5)	Tie (Not Classified) (6)
1	Major Joint Replacement Or Reattachment Of Lower Extremity W Mcc(469)	2.1	0.0	N/A	N/A	N/A	N/A
2	Major Joint Replacement Or Reattachment Of Lower Extremity W/O Mcc(470)	210.9	184.4	51.7	45.6	2.0	0.8
3	Vaginal Delivery W Sterilization &/Or D&C(767)	4.9	2.2	31.8	31.8	31.8	4.5
4	Vaginal Delivery W O.R. Proc Except Steril &/Or D&C(768)	0.6	0.3	100.0	0.0	0.0	0.0
5	Vaginal Delivery W Complicating Diagnoses(774)	19.8	13.0	29.2	23.1	46.2	1.5
6	Vaginal Delivery W/O Complicating Diagnoses(775)	138.3	131.2	31.6	32.6	35.5	0.4
7	Cesarean Section W Cc/Mcc(765)	32.7	25.0	31.2	18.0	50.0	0.8
8	Cesarean Section W/O Cc/Mcc(766)	91.5	82.2	32.0	32.1	35.5	0.4
9	Spinal Fusion Except Cervical W Mcc(459)	1.5	0.3	66.7	0.0	33.3	0.0
10	Spinal Fusion Except Cervical W/O Mcc(460)	81.8	53.4	57.9	38.8	3.2	0.2
11	Normal Newborn(795)	52.0	49.5	75.2	2.6	22.0	0.2
12	Major Small & Large Bowel Procedures W Mcc(329)	6.0	0.4	100.0	0.0	0.0	0.0
13	Major Small & Large Bowel Procedures W Cc(330)	12.4	3.1	51.6	22.6	25.8	0.0
14	Major Small & Large Bowel Procedures W/O Cc/Mcc(331)	31.5	20.8	41.8	50.0	8.2	0.0
15	Cervical Spinal Fusion W Mcc(471)	1.0	0.0	N/A	N/A	N/A	N/A
16	Cervical Spinal Fusion W Cc(472)	6.1	1.6	50.0	37.5	6.3	6.3
17	Cervical Spinal Fusion W/O Cc/Mcc(473)	36.2	21.6	49.1	46.8	1.9	2.3
18	Perc Cardiovasc Proc W/O Coronary Artery Stent W Mcc(250)	3.6	0.4	100.0	0.0	0.0	0.0
19	Perc Cardiovasc Proc W/O Coronary Artery Stent W/O Mcc(251)	35.4	20.1	54.2	40.3	3.5	1.5
20	Septicemia Or Severe Sepsis W/O Mv 96+ Hours W Mcc(871)	10.5	3.3	60.6	21.2	18.2	0.0
21	Septicemia Or Severe Sepsis W/O Mv 96+ Hours W/O Mcc(872)	23.0	17.5	34.9	56.0	9.1	0.0
22	Uterine & Adnexa Proc For Non-Malignancy W Cc/Mcc(742)	5.9	1.6	50.0	25.0	18.8	0.0
23	Uterine & Adnexa Proc For Non-Malignancy W/O Cc/Mcc(743)	26.6	18.3	51.9	33.3	13.7	1.1

Appendix Table 3-b. Contract Types by MS-DRG for Top 10 Clinical Conditions-Validation Sample: Medicare FFS

	MS DRG Descriptions (corresponding MS-DRGs)	Total Spending (in millions of dollars) (1)	Classifiable Spending (in millions of dollars) (2)	Classification			
				Discount (3)	Fixed (4)	Per Diem (5)	Tie (Not Classified) (6)
1	Major Joint Replacement Or Reattachment Of Lower Extremity W Mcc (469)	7.7	7.3	41.8	54.6	3.6	0.0
2	Major Joint Replacement Or Reattachment Of Lower Extremity W/O Mcc (470)	94.5	94.5	1.2	96.1	2.7	0.0
3	Septicemia Or Severe Sepsis W/O Mv 96+ Hours W Mcc (871)	52.0	52.0	0.1	98.7	1.3	0.0
4	Septicemia Or Severe Sepsis W/O Mv 96+ Hours W/O Mcc (872)	10.5	10.4	0.0	94.5	5.5	0.0
5	Spinal Fusion Except Cervical W Mcc (459)	4.4	3.7	17.5	79.1	3.4	0.0
6	Spinal Fusion Except Cervical W/O Mcc (460)	44.0	44.0	9.6	89.9	0.3	0.2
7	Rehabilitation W Cc/Mcc (945)	28.5	28.5	16.7	21.0	62.3	0.0
8	Rehabilitation W/O Cc/Mcc (946)	6.5	6.5	28.3	12.6	59.1	0.0
9	Simple Pneumonia & Pleurisy W Cc (194)	14.8	14.7	0.7	96.8	2.5	0.0
10	Simple Pneumonia & Pleurisy W Mcc (193)	11.2	11.1	0.0	82.3	17.7	0.0
11	Simple Pneumonia & Pleurisy W/O Cc/Mcc (195)	4.0	3.9	0.0	63.7	35.8	0.5
12	Major Small & Large Bowel Procedures W Cc (330)	13.6	13.4	7.9	90.0	2.1	0.0
13	Major Small & Large Bowel Procedures W Mcc (329)	10.9	10.6	7.8	89.6	2.6	0.0
14	Major Small & Large Bowel Procedures W/O Cc/Mcc (331)	4.2	4.0	9.3	87.1	3.6	0.0
15	Heart Failure & Shock W Cc (292)	13.1	13.0	2.6	95.3	2.1	0.0
16	Heart Failure & Shock W Mcc (291)	10.3	10.2	3.4	87.5	9.1	0.0
17	Heart Failure & Shock W/O Cc/Mcc (293)	2.7	2.5	1.1	77.7	20.4	0.8
18	Hip & Femur Procedures Except Major Joint W Cc (481)	6.1	5.7	14.4	82.3	3.4	0.0
19	Hip & Femur Procedures Except Major Joint W Mcc (480)	13.2	13.1	0.0	95.3	4.7	0.0
20	Hip & Femur Procedures Except Major Joint W/O Cc/Mcc (482)	3.8	3.7	0.0	92.5	6.6	0.8
21	Infectious & Parasitic Diseases W O.R. Procedure W Cc (854)	20.4	20.2	7.0	92.4	0.6	0.0
22	Infectious & Parasitic Diseases W O.R. Procedure W Mcc (853)	2.6	2.2	3.0	86.4	10.6	0.0
23	Infectious & Parasitic Diseases W O.R. Procedure W/O Cc/Mcc (855)	0.1	0.1	0.0	100.0	0.0	0.0
24	Cardiac Valve & Oth Maj Cardiothoracic Proc W/O Card Cath W Cc (220)	8.6	8.5	15.3	84.7	0.0	0.0
25	Cardiac Valve & Oth Maj Cardiothoracic Proc W/O Card Cath W Mcc (219)	10.3	10.2	51.2	48.8	0.0	0.0
26	Cardiac Valve & Oth Maj Cardiothoracic Proc W/O Card Cath W/O Cc/Mcc (221)	1.9	1.7	29.5	70.5	0.0	0.0

Appendix Table 3-c. Contract Types by MS-DRG for Top 10 Clinical Conditions-Validation Sample: Medicaid FFS

	MS DRG Descriptions (corresponding MS-DRGs)	Total Spending (in millions of dollars) (1)	Classifiable Spending (in millions of dollars) (2)	Classification			
				Discount (3)	Fixed (4)	Per Diem (5)	Tie (Not Classified) (6)
1	Vaginal Delivery W Sterilization &/Or D&C(767)	10.6	10.1	11.5	85.6	2.8	0.1
2	Vaginal Delivery W O.R. Proc Except Steril &/Or D&C(768)	0.2	0.0	0.0	100.0	0.0	0.0
3	Vaginal Delivery W Complicating Diagnoses(774)	64.2	64.1	21.8	76.5	1.6	0.0
4	Vaginal Delivery W/O Complicating Diagnoses(775)	231.1	231.1	22.0	78.0	0.0	0.0
5	Cesarean Section W Cc/Mcc(765)	82.3	82.1	9.9	72.6	17.5	0.0
6	Cesarean Section W/O Cc/Mcc(766)	80.2	80.1	6.6	92.5	0.8	0.0
7	Septicemia Or Severe Sepsis W/O Mv 96+ Hours W Mcc(871)	23.0	22.5	24.4	72.1	3.6	0.0
8	Septicemia Or Severe Sepsis W/O Mv 96+ Hours W/O Mcc(872)	9.5	8.7	14.0	80.9	5.1	0.0
9	Prematurity W Major Problems(791)	18.7	18.3	3.4	74.3	22.3	0.0
10	Prematurity W/O Major Problems(792)	13.7	13.5	17.3	18.4	64.3	0.0
11	Admit For Renal Dialysis(685)	31.2	31.1	0.0	86.5	13.4	0.1
12	Bronchitis & Asthma W Cc/Mcc(202)	8.4	7.9	12.7	83.4	3.9	0.0
13	Bronchitis & Asthma W/O Cc/Mcc(203)	17.9	17.5	1.0	98.0	0.9	0.1
14	Major Joint Replacement Or Reattachment Of Lower Extremity W Mcc(469)	0.8	0.2	33.8	66.2	0.0	0.0
15	Major Joint Replacement Or Reattachment Of Lower Extremity W/O Mcc(470)	22.7	21.6	11.0	87.1	1.3	0.6
16	Simple Pneumonia & Pleurisy W Mcc(193)	4.7	4.0	6.7	88.1	5.2	0.0
17	Simple Pneumonia & Pleurisy W Cc(194)	9.4	8.8	6.0	91.7	2.2	0.1
18	Simple Pneumonia & Pleurisy W/O Cc/Mcc(195)	7.1	6.6	9.9	86.0	3.8	0.3
19	Spinal Fusion Except Cervical W Mcc(459)	1.3	0.3	0.0	100.0	0.0	0.0
20	Spinal Fusion Except Cervical W/O Mcc(460)	19.2	18.0	12.7	85.1	2.2	0.0
21	Major Small & Large Bowel Procedures W Cc(330)	7.9	5.0	1.9	86.4	11.7	0.0
22	Major Small & Large Bowel Procedures W Mcc(329)	9.0	6.7	20.5	72.4	7.1	0.0
23	Major Small & Large Bowel Procedures W/O Cc/Mcc(331)	2.5	1.3	18.6	74.3	7.0	0.0

SOURCE Authors' analysis of CO APCD data for January 2009-December 2014 and MEDPAR's Colorado Medicare Fee-For-Service claims for January 2014-December 2014

NOTES Clinical conditions are defined by combining pairs or triplets of MS-DRGs with and without complications, or closely related procedures (vaginal delivery). Classifiable spending indicates that they are from quads with at least 3 claims, which is a requirement of our algorithm, as described in the methods section. Among classifiable spending, the percentages denote the fraction of spending our algorithm classifies as discounted charge, fixed rate, per diem, or (in case of an exact tie among CVs) not classified. All spending values have been inflation adjusted to 2014 dollars using the BLS All Items Consumer Price Index.

Appendix Table 4-a. Distribution of Payer Size

	No. of Payers	No. of Claims per Payer						
		mean	sd	min	p25	p50	p75	max
2009	24	681	1,318	2	35	83	653	5,505
2010	24	598	1,038	2	34	116	782	4,502
2011	27	724	1,501	1	22	91	604	6,881
2012	28	995	2,868	2	32	114	642	14,971
2013	27	1,117	3,078	1	22	100	718	15,399
2014	26	1,188	2,533	3	25	119	978	11,399
Total	30	4,638	10,210	2	188	531	3,898	48,650

SOURCE Authors' analysis of CO APCD data for January 2009-December 2014.

NOTES This table shows the annual number of distinct payers and the distribution of claims for each payer for each year in our analysis sample. The increasing trend in claims may reflect the addition of more payers, especially one large payer, which entered in 2011.

Appendix Table 4-b. Contract Types by Health Plans within Payer Family

Payer Family/ Health Plan	Total Spending (in millions of dollars) (1)	Classifiable Spending (in millions of dollars) (2)	Contract Type (% of classifiable spending)			
			Discount (3)	Fixed (4)	Per Diem (5)	Tie (Not Classified) (6)
A/A1	598.2	511.4	25.1	63.9	10.6	0.4
B/B1	485.7	224.7	49.0	28.0	21.9	1.2
C/C1	235.6	117.7	82.7	6.9	9.7	0.7
D	197.8	75.6	59.0	9.6	29.7	1.7
D1	141.6	58.8	64.7	8.2	25.3	1.8
D2	49.5	15.4	38.6	15.1	45.3	1.0
D3	6.7	1.4	42.0	9.7	43.5	4.8
E	115.9	30.8	53.5	20.0	25.2	1.3
E1	60.3	13.6	70.7	14.5	14.8	0.0
E2	55.5	17.2	40.0	24.3	33.4	2.4
F/F1	92.4	41.0	27.7	49.9	21.2	1.2
G	82.6	29.0	41.4	12.1	44.8	1.7
G1	28.7	9.9	40.9	7.2	49.3	2.6
G2	53.9	19.1	41.7	14.7	42.4	1.2
H/H1	38.3	18.2	92.8	1.6	5.1	0.5
I/I1	16.4	4.4	70.6	1.4	26.6	1.4
J	7.3	5.8	98.9	0.0	0.6	0.5
J1	6.3	5.0	99.5	0.0	0.0	0.5
J2	1.0	0.8	95.5	0.0	4.5	0.0

SOURCE Authors' analysis of CO APCD data for January 2009-December 2014.

NOTES Payer families are indicated by a letter ("A" through "J") and health plans are indicated by a letter plus a number (e.g. "A1"). Payers with less than 100 classifiable claims are excluded. Classifiable spending indicates that they are from quads with at least 3 claims and Pay Families are identified using the 3 digit of 4 digit payer codes.

Appendix Table 5. Claims and Spending by Quad Size

Quad size	Analysis Sample: Private Health Plans						Validation Sample: Medicare FFS						Validation Sample: Medicare				
	Quads (1)	% of Quads (2)	Claims (3)	% of Claims (4)	Spending (\$1M) (5)	% of Spending (6)	Quads (7)	% of Quads (8)	Claims (9)	% of Claims (10)	Spending (\$1M) (11)	% of Spending (12)	Quads (13)	% of Quads (14)	Claims (15)	% of Claims (16)	
'09	Quads w claims <3	6,802	85.6%	7,974	48.8%	120.9	57.4%	-	-	-	-	-	-	4,294	68.4%	5,349	12.6%
	Quads w claims >=3	1,143	14.4%	8,359	51.2%	89.8	42.6%	-	-	-	-	-	-	1,986	31.6%	36,978	87.4%
	Total	7,945	100.0%	16,333	100.0%	210.8	100.0%	-	-	-	-	-	-	6,280	100.0%	42,327	100.0%
'10	Quads w claims <3	6,243	85.6%	7,287	50.7%	123.7	60.1%	-	-	-	-	-	-	4,598	68.2%	5,727	13.0%
	Quads w claims >=3	1,054	14.4%	7,076	49.3%	82.2	39.9%	-	-	-	-	-	-	2,149	31.9%	38,327	87.0%
	Total	7,297	100.0%	14,363	100.0%	205.9	100.0%	-	-	-	-	-	-	6,747	100.0%	44,054	100.0%
'11	Quads w claims <3	6,084	82.9%	7,053	36.1%	126.4	48.1%	-	-	-	-	-	-	4,762	68.0%	6,027	13.9%
	Quads w claims >=3	1,256	17.1%	12,495	63.9%	136.4	51.9%	-	-	-	-	-	-	2,239	32.0%	37,477	86.2%
	Total	7,340	100.0%	19,548	100.0%	262.8	100.0%	-	-	-	-	-	-	7,001	100.0%	43,504	100.0%
'12	Quads w claims <3	6,353	81.3%	7,380	26.5%	136.2	37.8%	-	-	-	-	-	-	4,848	67.8%	6,139	14.2%
	Quads w claims >=3	1,463	18.7%	20,471	73.5%	223.7	62.2%	-	-	-	-	-	-	2,304	32.2%	37,152	85.8%
	Total	7,816	100.0%	27,851	100.0%	359.9	100.0%	-	-	-	-	-	-	7,152	100.0%	43,291	100.0%
'13	Quads w claims <3	6,743	81.1%	7,905	26.2%	157.6	37.4%	-	-	-	-	-	-	4,927	68.1%	6,276	14.1%
	Quads w claims >=3	1,576	18.9%	22,249	73.8%	263.6	62.6%	-	-	-	-	-	-	2,307	31.9%	38,159	85.9%
	Total	8,319	100.0%	30,154	100.0%	421.2	100.0%	-	-	-	-	-	-	7,234	100.0%	44,435	100.0%
'14	Quads w claims <3	7,667	81.5%	9,022	29.2%	185.4	41.2%	7,770	52.4%	10,180	10.1%	125.2	10.7%	5,697	64.6%	7,239	14.0%
	Quads w claims >=3	1,737	18.5%	21,863	70.8%	265.1	58.9%	7,047	47.6%	90,861	89.9%	1,050.9	89.4%	3,126	35.4%	44,529	86.0%
	Total	9,404	100.0%	30,885	100.0%	450.5	100.0%	14,817	100.0%	101,041	100.0%	1,176.2	100.0%	8,823	100.0%	51,768	100.0%
All Year	Quads w claims <3	39,892	82.9%	46,621	33.5%	850.2	44.5%	7,770	52.4%	10,180	10.1%	125.2	10.7%	29,126	67.4%	36,757	13.7%
	Quads w claims >=3	8,229	17.1%	92,513	66.5%	1,060.9	55.5%	7,047	47.6%	90,861	89.9%	1,050.9	89.4%	14,111	32.6%	232,622	86.4%
	Total	48,121	100.0%	139,134	100.0%	1,911.1	100.0%	14,817	100.0%	101,041	100.0%	1,176.2	100.0%	43,237	100.0%	269,379	100.0%

SOURCE Authors' analysis of CO APCD data for January 2009-December 2014 and MEDPAR's Colorado Medicare Fee-For-Service claims for January 2014-December 2014.

NOTES Quads are defined as a combination of hospital-health plan-year-procedural groups in our sample. The table provides information about the size distribution of quads in terms of their number of claims and spending. All spending values have been inflation adjusted to 2014 dollars using the BLS All Items Consumer Price Index.

Appendix Table 6. Quads by Contract for Algorithm

Year	Analysis Sample: Private Health Plans						Validation Sample: Medicare FFS						Validation Sample: Medicaid FFS					
	Total Quads (1)	Classifiable Quads (2)	Contract Type (% of classifiable quads)				Total Quads (7)	Classifiable Quads (8)	Contract Type (% of classifiable quads)				Total Quads (13)	Classifiable Quads (14)	Contract Type (% of classifiable quads)			
			Dis-count (3)	Fixed (4)	Per Diem (5)	Tie -Not Classified (6)			Dis-count (9)	Fixed (10)	Per Diem (11)	Tie - Not Classified (12)			Dis-count (15)	Fixed (16)	Per Diem (17)	Tie -Not Classified (18)
2009	7,945	1,143	54.1	13.0	30.2	2.8	-	-	-	-	-	-	6,280	1,986	7.6	84.0	7.8	0.6
2010	7,297	1,054	51.8	15.5	31.1	1.6	-	-	-	-	-	-	6,747	2,149	9.0	83.2	6.8	1.0
2011	7,340	1,256	48.2	22.8	26.6	2.5	-	-	-	-	-	-	7,001	2,239	8.8	82.8	7.6	0.7
2012	7,816	1,463	45.5	24.3	27.7	2.6	-	-	-	-	-	-	7,152	2,304	10.4	81.9	6.8	1.0
2013	8,319	1,576	40.7	27.2	30.0	2.0	-	-	-	-	-	-	7,234	2,307	12.1	79.4	7.3	1.1
2014	9,404	1,737	36.0	33.2	28.8	2.0	14,817	7,047	4.9	86.4	7.6	1.1	8,823	3,126	18.6	71.0	9.6	0.8
Total	48,121	8,229	45.0	23.8	29.0	2.2	14,817	7,047	4.9	86.4	7.6	1.1	43,237	14,111	11.6	79.7	7.8	0.9

SOURCE Authors' analysis of CO APCD data for January 2009-December 2014 and MEDPAR's Colorado Medicare Fee-For-Service claims for January 2014-December 2014.

NOTES Quads are defined as a combination of hospital-health plan-year-procedural groups in our sample.

Appendix Table 7-a. Claims by Contract Type Excluding Quads with Fewer than 4 Claims

Year	Analysis Sample: Private Health Plans						Validation Sample: Medicare FFS						Validation Sample: Medicaid FFS					
	Total Claims (1000s)	Classifiable Claims (1000s)	Contract Type (% of classifiable claims)				Total Claims (1000s)	Classifiable Claims (1000s)	Contract Type (% of classifiable claims)				Total Claims (1000s)	Classifiable Claims (1000s)	Contract Type (% of classifiable claims)			
			Dis-count	Fixed	Per Diem	Tie - Not Classified			Dis-count	Fixed	Per Diem	Tie - Not Classified			Dis-count	Fixed	Per Diem	Tie - Not Classified
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	
2009	16.3	7.1	54.5	11.6	33.1	0.8	-	-	-	-	-	42.3	35.4	11.5	84.2	4.2	0.1	
2010	14.4	5.9	53.3	12.5	33.8	0.5	-	-	-	-	-	44.1	36.6	11.7	84.5	3.8	0.1	
2011	19.5	11.3	49.7	28.5	21.5	0.4	-	-	-	-	-	43.5	35.6	14.3	80.5	5.2	0.0	
2012	27.9	19.2	47.2	30.7	21.6	0.6	-	-	-	-	-	43.3	35.2	12.4	83.5	3.9	0.2	
2013	30.2	20.9	40.0	38.7	21.2	0.1	-	-	-	-	-	44.4	36.3	17.6	79.3	3.0	0.1	
2014	30.9	20.3	27.8	44.9	27.1	0.2	101.0	86.6	5.4	89.6	4.9	0.1	51.8	42.1	18.2	74.0	7.8	0.1
Total	139.1	84.8	42.1	32.9	24.6	0.4	101.0	86.6	5.4	89.6	4.9	0.1	269.4	221.3	14.4	80.8	4.8	0.1

Appendix Table 7-b. Spending by Contract Type Excluding Quads with Fewer than 4 Claims

Year	Analysis Sample: Private Health Plans						Validation Sample: Medicare FFS						Validation Sample: Medicaid FFS					
	Total Spending (millions, \$)	Classifiable Spending (millions,\$)	Contract Type (% of classifiable spending)				Total Spending (millions, \$)	Classifiable Spending (millions,\$)	Contract Type (% of classifiable spending)				Total Spending (millions, \$)	Classifiable Spending (millions,\$)	Contract Type (% of classifiable spending)			
			Dis-count	Fixed	Per Diem	Tie - Not Classified			Dis-count	Fixed	Per Diem	Tie - Not Classified			Dis-count	Fixed	Per Diem	Tie - Not Classified
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	
2009	210.8	70.3	67.4	12.5	19.4	0.7	-	-	-	-	-	213.2	162.0	10.7	84.0	5.2	0.0	
2010	205.9	64.1	66.0	14.5	19.0	0.5	-	-	-	-	-	214.5	163.2	10.5	84.4	4.9	0.2	
2011	262.8	116.5	46.3	39.9	13.3	0.5	-	-	-	-	-	211.9	157.2	11.7	81.1	7.1	0.0	
2012	359.9	203.4	40.8	45.4	13.2	0.6	-	-	-	-	-	211.7	153.4	13.0	82.2	4.6	0.2	
2013	421.2	240.3	35.7	48.4	15.7	0.2	-	-	-	-	-	222.0	161.5	17.1	78.6	4.2	0.1	
2014	450.5	237.6	26.5	56.0	17.2	0.3	1,176.2	997.7	7.8	86.9	5.2	0.1	276.4	209.0	18.7	72.9	8.4	0.1
Total	1,911.1	932.3	40.3	43.6	15.7	0.4	1,176.2	997.7	7.8	86.9	5.2	0.1	1,349.8	1,006.4	13.9	80.2	5.9	0.1

Appendix Table 7-c. Quads by Contract Type Excluding Quads with Fewer than 4 Claims

Year	Analysis Sample: Private Health Plans						Validation Sample: Medicare FFS						Validation Sample: Medicaid FFS					
	Total Quads	Classifiable Quads	Contract Type (% of classifiable quads)				Total Quads	Classifiable Quads	Contract Type (% of classifiable quads)				Total Quads	Classifiable Quads	Contract Type (% of classifiable quads)			
			Dis-count	Fixed	Per Diem	Tie - Not Classified			Dis-count	Fixed	Per Diem	Tie - Not Classified			Dis-count	Fixed	Per Diem	Tie - Not Classified
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	
2009	7,945	736	53.3	13.6	31.5	1.6	-	-	-	-	-	-	6,280	1,460	6.7	85.7	7.3	0.3
2010	7,297	656	51.8	13.9	33.4	0.9	-	-	-	-	-	-	6,747	1,573	8.1	86.1	5.3	0.5
2011	7,340	846	47.3	24.9	26.8	1.0	-	-	-	-	-	-	7,001	1,625	7.9	85.7	6.2	0.3
2012	7,816	1,046	45.3	25.2	27.3	2.1	-	-	-	-	-	-	7,152	1,651	9.2	84.1	6.1	0.6
2013	8,319	1,138	40.5	28.8	30.1	0.5	-	-	-	-	-	-	7,234	1,690	11.9	81.7	6.0	0.5
2014	9,404	1,225	34.9	34.9	29.4	0.7	14,817	5,630	4.9	88.2	6.5	0.4	8,823	2,326	17.5	73.5	8.7	0.3
Total	48,121	5,647	44.2	25.2	29.5	1.1	14,817	5,630	4.9	88.2	6.5	0.4	43,237	10,325	10.8	82.1	6.7	0.4

SOURCE Authors' analysis of CO APCD data for January 2009-December 2014 and MEDPAR's Colorado Medicare Fee-For-Service claims for January 2014-December 2014.

NOTES Classifiable claims and spending indicate that they are from quads with at least 4 claims. The percentages denote the fraction of claims, spending or quads our algorithm classifies as discounted charge, fixed rate, per diem, or (in case of a tie among CVs) not classified. All spending values have been inflation adjusted to 2014 dollars using the BLS All Items Consumer Price Index.

Appendix Table 8-a. Claims by Contract Type Excluding One Payer

Year	Analysis Sample: Private Health Plans					
	Total Claims (in thousands) (1)	Classifiable Claims (in thousands) (2)	Contract Type (% of classifiable claims)			
			Discount (3)	Fixed (4)	Per Diem (5)	Tie - Not Classified (6)
2009	16.3	8.4	54.6%	11.6%	32.3%	1.4%
2010	14.4	7.1	53.0%	13.4%	32.7%	0.9%
2011	12.7	6.4	51.0%	12.9%	34.6%	1.5%
2012	12.9	6.6	50.3%	13.2%	35.3%	1.3%
2013	14.8	8.0	45.9%	15.0%	38.2%	1.0%
2014	19.5	11.5	40.8%	23.4%	34.9%	0.9%
Total	90.5	48.0	48.5%	15.7%	34.7%	1.1%

Appendix Table 8-b. Spending by Contract Type Excluding One Payer

Year	Analysis Sample: Private Health Plans					
	Total Spending (in millions of dollars) (1)	Classifiable Spending (in millions of dollars) (2)	Contract Type (% of classifiable spending)			
			Discount (3)	Fixed (4)	Per Diem (5)	Tie - Not Classified (6)
2009	210.8	89.8	68.9%	11.4%	18.3%	1.4%
2010	205.9	82.2	65.1%	15.5%	18.7%	0.7%
2011	182.6	70.8	59.8%	17.8%	20.8%	1.6%
2012	185.1	71.5	58.8%	17.3%	22.6%	1.3%
2013	226.3	95.9	56.9%	17.6%	24.3%	1.3%
2014	302.1	139.2	46.0%	31.7%	21.3%	1.0%
Total	1,312.9	549.5	58.0%	19.8%	21.0%	1.2%

SOURCE Authors' analysis of CO APCD data for January 2009-December 2014.

NOTES Classifiable claims and spending indicate that they are from quads with at least 3 claims, which is a requirement of our algorithm, as described in the methods section. Among classifiable quads, the percentages denote the fraction of claims or spending our algorithm classifies as discounted charge, fixed rate, per diem, or (in case of a tie among CVs) not classified. All spending values have been inflation adjusted to 2014 dollars using the BLS All Items Consumer Price Index.

Appendix Table 9-a. Claims by Contract Type using Algorithm with Bounds

Year	Analysis Sample: Private Health Plans						Validation Sample: Medicare FFS						Validation Sample: Medicaid FFS					
	Total Claims (1000s)	Classifiable Claims (1000s)	Contract Type (% of classifiable claims)				Total Claims (1000s)	Classifiable Claims (1000s)	Contract Type (% of classifiable claims)				Total Claims (1000s)	Classifiable Claims (1000s)	Contract Type (% of classifiable claims)			
			Dis-count	Fixed	Per Diem	Tie - Not Classified			Dis-count	Fixed	Per Diem	Tie - Not Classified			Dis-count	Fixed	Per Diem	Tie - Not Classified
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	
2009	16.3	8.4	28.1	5.4	8.4	58.0	-	-	-	-	-	42.3	37.0	0.6	19.5	0.3	79.5	
2010	14.4	7.1	32.3	6.4	13.8	47.6	-	-	-	-	-	44.1	38.3	1.5	20.5	0.3	77.7	
2011	19.5	12.5	28.9	22.1	9.6	39.4	-	-	-	-	-	43.5	37.5	1.2	19.8	0.4	78.6	
2012	27.9	20.5	32.6	19.7	7.9	39.8	-	-	-	-	-	43.3	37.2	2.1	26.5	0.5	70.9	
2013	30.2	22.2	13.1	20.0	8.2	58.7	-	-	-	-	-	44.4	38.2	4.5	24.0	0.6	70.9	
2014	30.9	21.9	10.9	28.5	14.0	46.6	101.0	90.9	2.2	51.0	2.3	44.5	51.8	44.5	6.2	18.9	0.9	74.0
Total	139.1	92.5	21.8	19.9	10.2	48.1	101.0	90.9	2.2	51.0	2.3	44.5	269.4	232.6	2.8	21.5	0.5	75.2

Appendix Table 9-b. Spending by Contract Type using Algorithm with Bounds

Year	Analysis Sample: Private Health Plans						Validation Sample: Medicare FFS						Validation Sample: Medicaid FFS					
	Total Spending (millions, \$)	Classifiable Spending (millions,\$)	Contract Type (% of classifiable spending)				Total Spending (millions, \$)	Classifiable Spending (millions,\$)	Contract Type (% of classifiable spending)				Total Spending (millions, \$)	Classifiable Spending (millions,\$)	Contract Type (% of classifiable spending)			
			Dis-count	Fixed	Per Diem	Tie - Not Classified			Dis-count	Fixed	Per Diem	Tie - Not Classified			Dis-count	Fixed	Per Diem	Tie - Not Classified
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	
2009	210.8	89.8	40.3	6.6	4.2	48.9	-	-	-	-	-	213.2	173.5	0.9	20.5	0.4	78.2	
2010	205.9	82.2	43.6	7.2	8.0	41.2	-	-	-	-	-	214.5	174.0	1.9	21.6	0.4	76.1	
2011	262.8	136.4	33.4	29.6	5.7	31.3	-	-	-	-	-	211.9	169.2	1.8	21.9	0.6	75.8	
2012	359.9	223.7	29.7	26.5	5.0	38.7	-	-	-	-	-	211.7	167.4	2.8	28.0	0.7	68.6	
2013	421.2	263.6	17.9	22.9	5.3	53.9	-	-	-	-	-	222.0	174.5	4.7	25.7	0.8	68.8	
2014	450.5	265.1	14.6	34.2	8.4	42.8	1,176.2	1,050.9	4.4	46.3	2.0	47.4	276.4	225.9	7.1	20.2	1.5	71.2
Total	1,911.1	1,060.9	25.4	24.8	6.2	43.6	1,176.2	1,050.9	4.4	46.3	2.0	47.4	1,349.8	1,084.6	3.4	22.8	0.8	73.0

SOURCE Authors' analysis of CO APCD data for January 2009-December 2014 and MEDPAR's Colorado Medicare Fee-For-Service claims for January 2014-December 2014.

NOTES Classification with bounds are based on additional requirements that the minimum CV within the quad must be: (1) less than 0.05 and, (2) at least 0.05 less than the next closest CV. Classifiable claims and spending indicate that they are from quads with at least 3 claims, which is a requirement of our algorithm, as described in the methods section. All spending values have been inflation adjusted to 2014 dollars using the BLS All Items Consumer Price Index.

Appendix Table 10. Sensitivity Analyses Using Different Values of Bounds

Gap between two smallest CVs	Minimum CV	% Classification			
		Discount	Fixed	PerDiem	Tie - Not Classified
N/A	N/A	42.5	31.9	24.9	0.7
0.01	N/A	42.5	31.9	24.9	0.8
0.05	N/A	42.4	31.9	24.8	0.9
0.10	N/A	42.2	31.6	24.6	1.6
N/A	0.01	11.0	9.8	4.2	75.0
N/A	0.05	22.0	19.9	10.2	48.0
N/A	0.10	29.8	26.1	18.5	25.6
0.01	0.01	11.0	9.8	4.2	75.1
0.01	0.05	21.9	19.9	10.2	48.0
0.01	0.10	29.8	26.1	18.5	25.6
0.02	0.01	11.0	9.8	4.2	75.1
0.02	0.05	21.9	19.9	10.2	48.0
0.02	0.10	29.8	26.1	18.5	25.7
0.03	0.01	11.0	9.8	4.2	75.1
0.03	0.05	21.9	19.9	10.2	48.1
0.03	0.10	29.8	26.1	18.5	25.7
0.04	0.01	11.0	9.8	4.2	75.1
0.04	0.05	21.9	19.9	10.2	48.1
0.04	0.10	29.7	26.1	18.5	25.7
0.05	0.01	10.9	9.8	4.2	75.1
0.05	0.05	21.8	19.9	10.2	48.1
0.05	0.10	29.7	26.1	18.5	25.8
0.06	0.01	10.9	9.8	4.2	75.2
0.06	0.05	21.8	19.9	10.1	48.2
0.06	0.10	29.7	26.1	18.4	25.8
0.07	0.01	10.9	9.8	4.2	75.2
0.07	0.05	21.8	19.9	10.1	48.3

0.07	0.10	29.6	26.0	18.4	25.9
0.08	0.01	10.9	9.8	4.2	75.2
0.08	0.05	21.8	19.9	10.1	48.3
0.08	0.10	29.6	26.0	18.4	26.0
0.09	0.01	10.9	9.7	4.2	75.3
0.09	0.05	21.7	19.8	10.0	48.4
0.09	0.10	29.6	26.0	18.3	26.2
0.10	0.01	10.9	9.7	4.2	75.3
0.10	0.05	21.7	19.8	10.0	48.5
0.10	0.10	29.5	25.9	18.3	26.3

SOURCE Authors' analysis of CO APCD data for January 2009-December 2014.

NOTES Classification with bounds is based on the additional requirements that the minimum CV within the quad must be (1) sufficiently small and (2) sufficiently different from the next smallest CV. This table provides different combinations of these requirements.

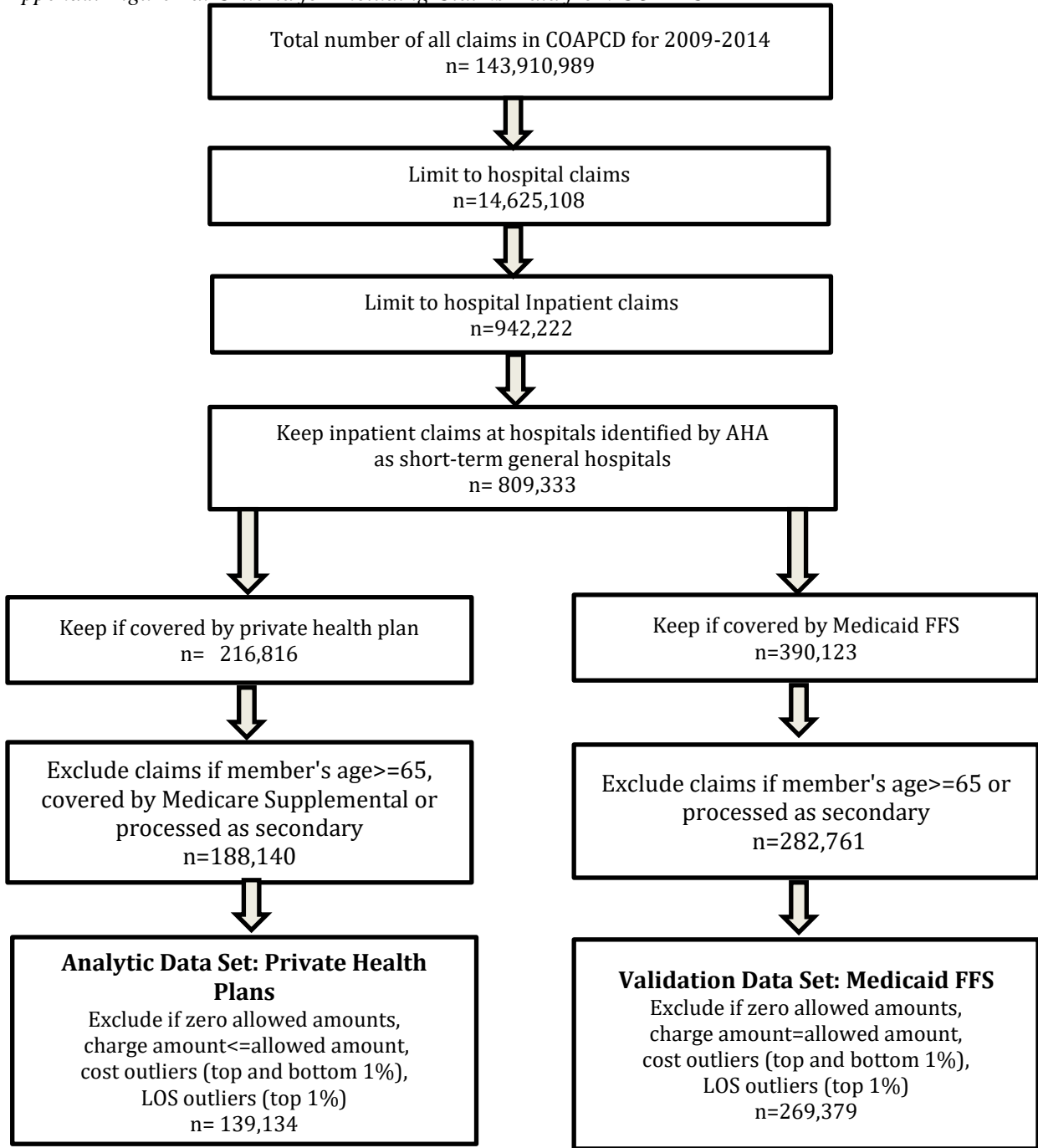
Appendix Table 11. Quantification Exercises to Explore the Role of Special Payment Provisions in Medicare FFS

Analysis	Validation Sample: Medicare FFS																	
	Total Spending (mil, \$)	Classifiable Spending (mil, \$)	Contract Type (% of classifiable spending)				Total Claims (1000s)	Classifiable Claims (1000s)	Contract Type (% of classifiable claims)				Total Quads	Classifiable Quads	Contract Type (% of classifiable quads)			
			Dis-count	Fixed	Per Diem	Tie - Not Classified			Dis-count	Fixed	Per Diem	Tie - Not Classified			Dis-count	Fixed	Per Diem	Tie - Not Classified
(7)	(8)	(9)	(10)	(11)	(12)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	
Main	1,176.2	1,050.9	7.8	86.3	5.7	0.2	101.0	90.9	5.3	89.1	5.3	0.3	14,817	7,047	4.9	86.4	7.6	1.1
Add'l 1	1,143.8	1,022.5	1.4	93.2	5.2	0.2	101.0	90.9	1.6	93.2	4.9	0.3	14,817	7,047	1.3	90.9	6.7	1.1
Add'l 2	1,109.7	1,001.3	1.5	95.2	3.2	0.2	97.2	88.5	1.6	95.8	2.4	0.3	13,260	6,665	1.3	96.1	1.6	1.0
Add'l 3	1,063.7	955.4	0.5	98.6	0.6	0.2	93.6	84.9	0.3	99.1	0.3	0.3	13,198	6,610	0.9	97.0	1.1	1.0
Add'l 4	34.1	21.1	0.5	0.3	98.3	0.9	3.8	2.4	0.5	0.3	97.9	1.3	1,557	382	1.1	0.5	95.8	2.6

SOURCE Authors' analysis of CO APCD data for January 2009-December 2014.

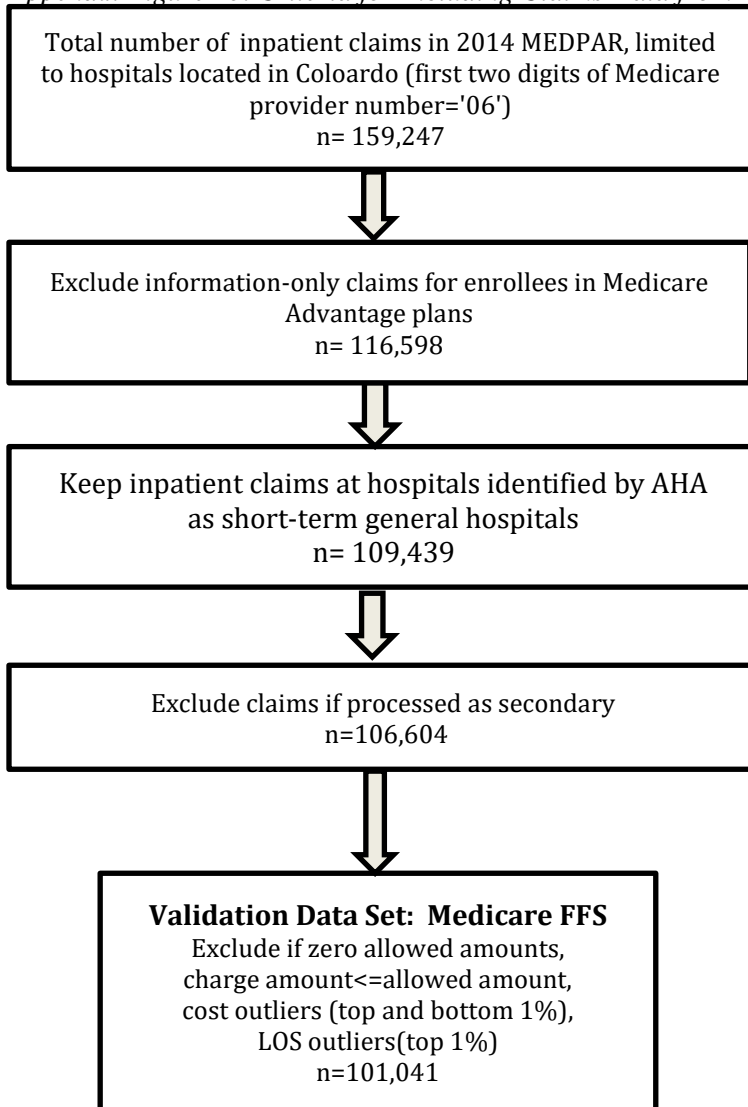
NOTES Main Analysis corresponds to the main Medicare FFS result of paper. Additional Analysis 1 uses the same Medicare FFS sample as the main analysis but use DRG_PRICE as the payment variable instead of the Allowed Amount (thus showing how much of the “misclassification” of discounted charges is because of outlier payments). Additional Analysis 2 also uses DRG_PRICE as the payment variable, but now also omits CAHs (thus showing how much of the “misclassification” of discounted charges is because of CAHs). Additional Analysis 3 is the same as AA2, but now also omits special units (thus showing how much of the “misclassification” is because of special unit claims, such as rehabilitation and psychiatric claims). Additional Analysis 4 is the inverse of AA2, keeping only CAHs and using DRG_PRICE (thus showing you how CAHs are paid).

Appendix Figure 1a. Criteria for Including Claims Data from CO APCD



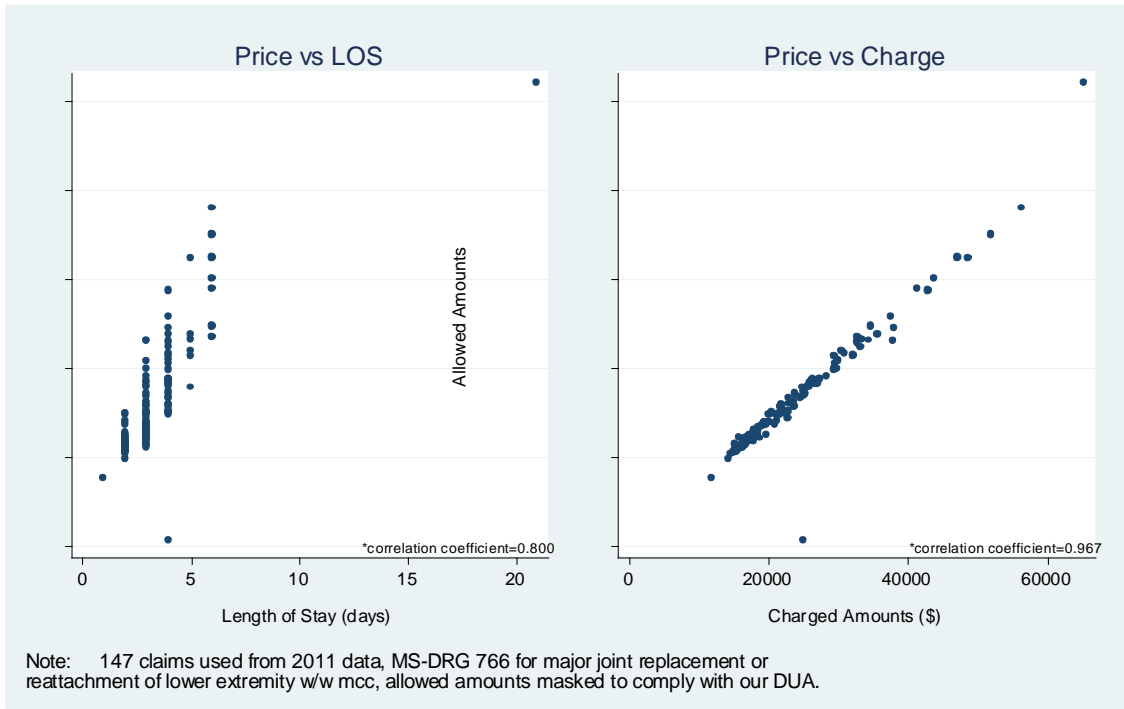
SOURCE Authors' analysis of CO APCD data for January 2009-December 2014.

Appendix Figure 1b. Criteria for Including Claims Data from Medicare FFS

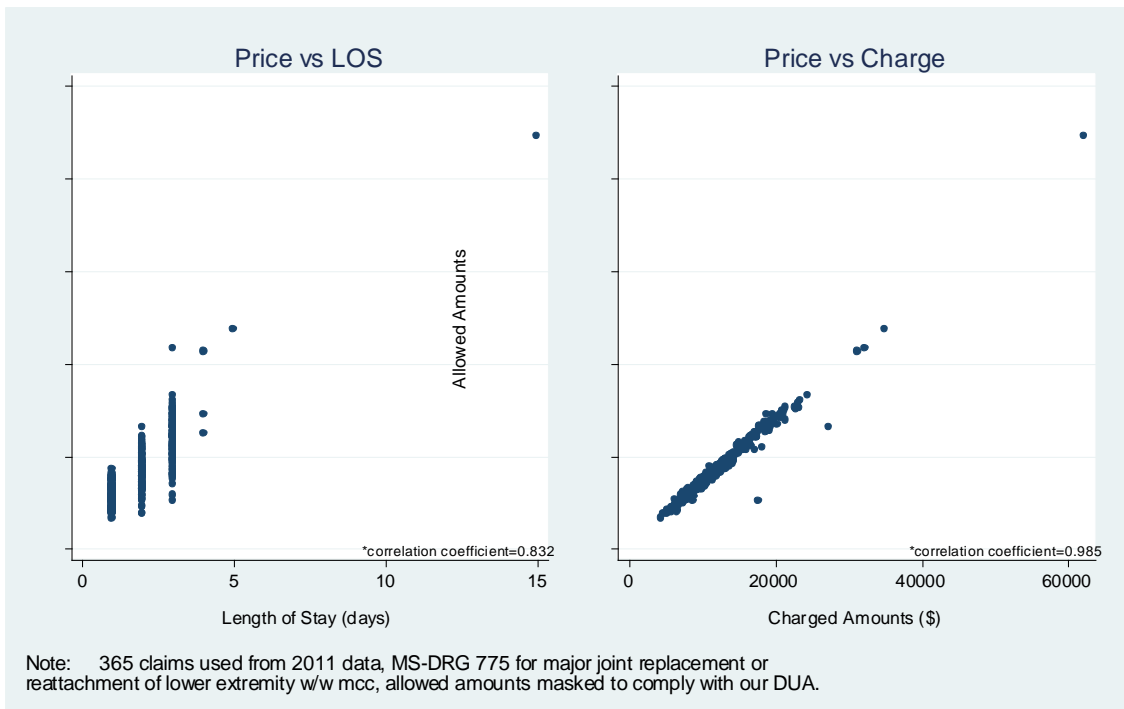


SOURCE Authors' analysis of MEDPAR's Colorado Medicare Fee-For-Service claims for January 2014-December 2014.

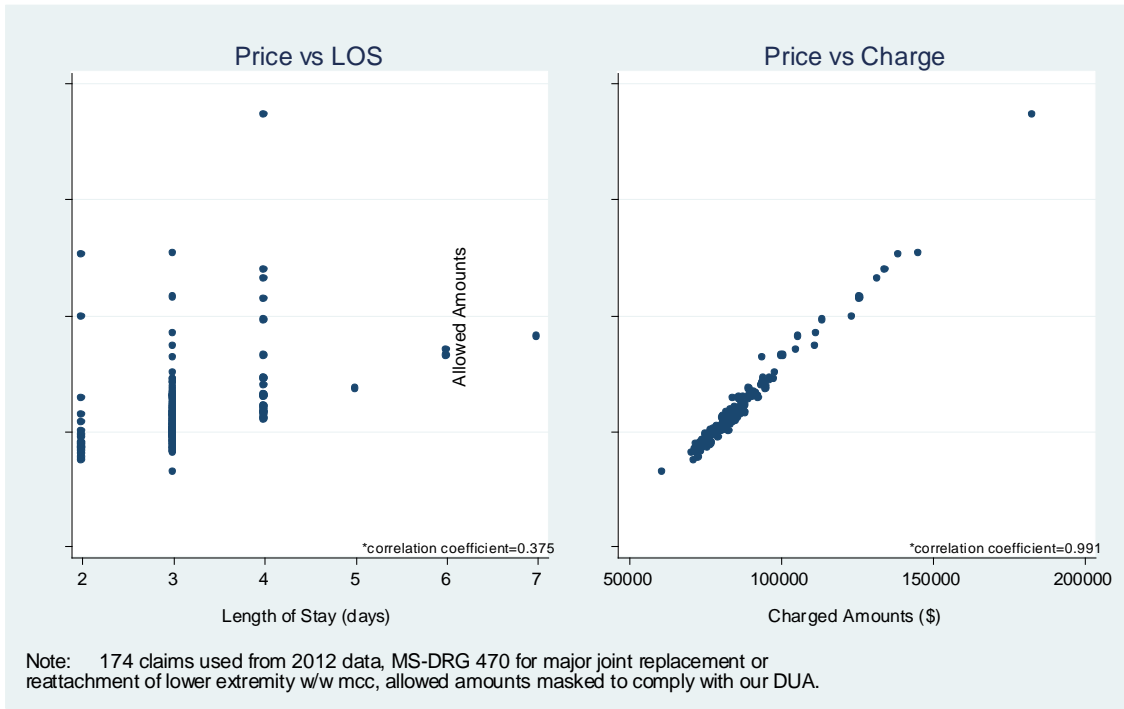
Appendix Figure 2-a. Discounted Charge Contract-Example 1



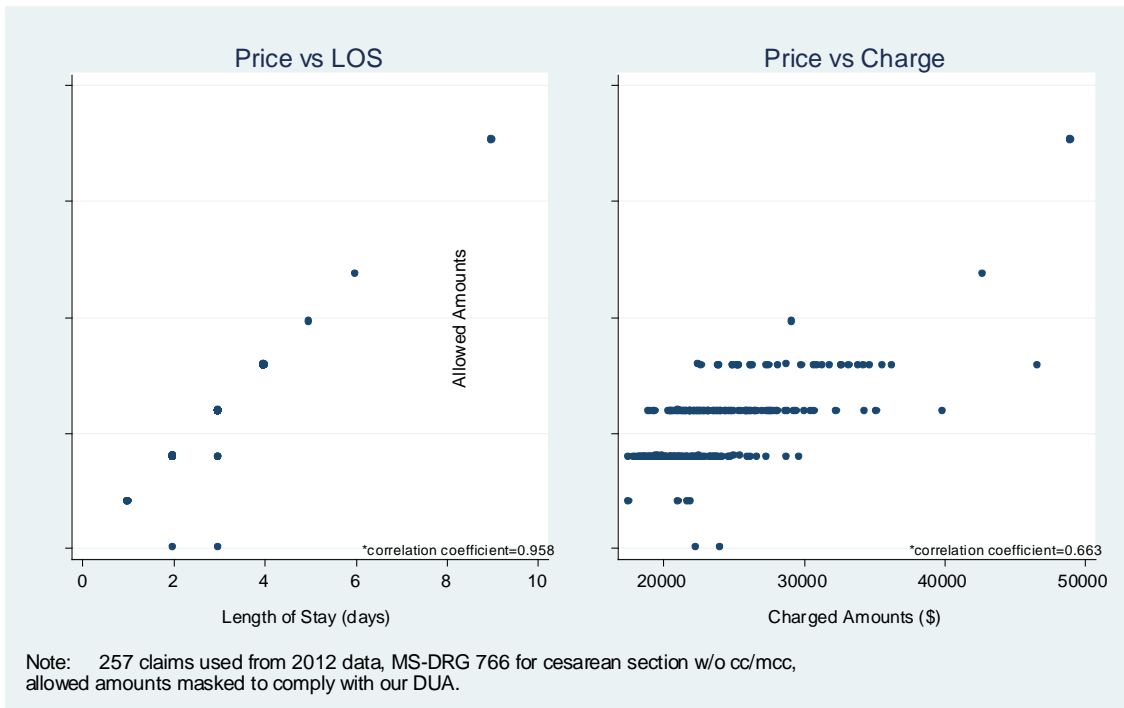
Appendix Figure 2-b. Discounted Charge Contract-Example 2



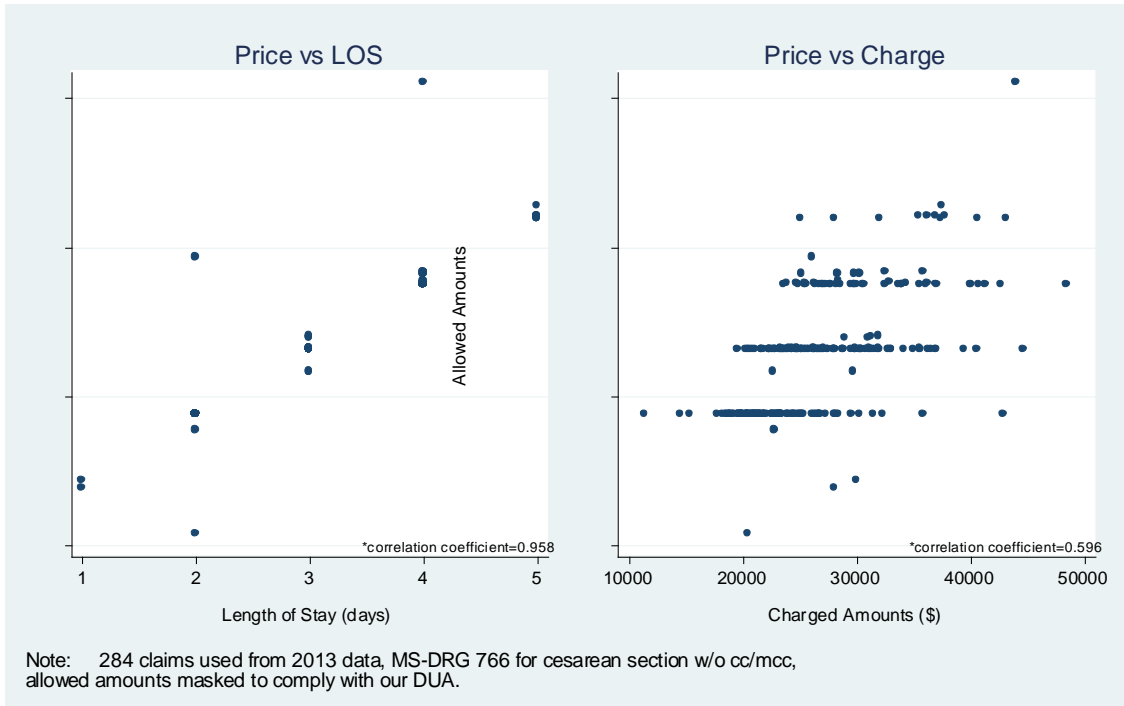
Appendix Figure 2-c. Discounted Charge Contract-Example 3



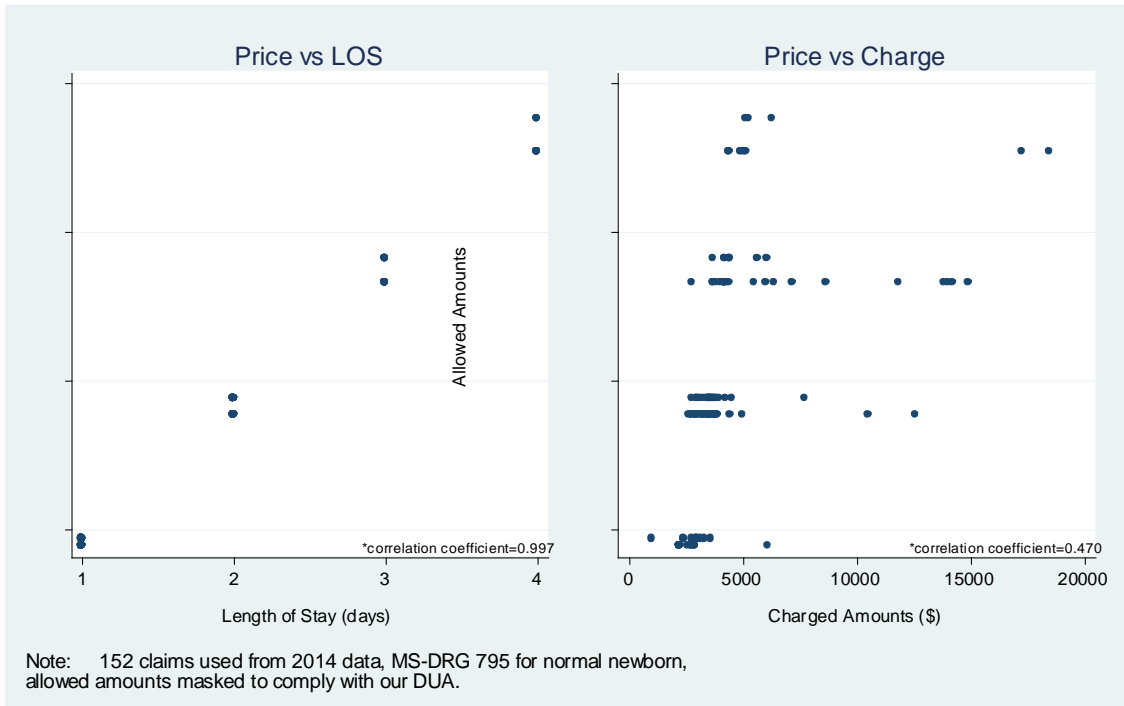
Appendix Figure 3-a. Per Diem Contract-Example 1



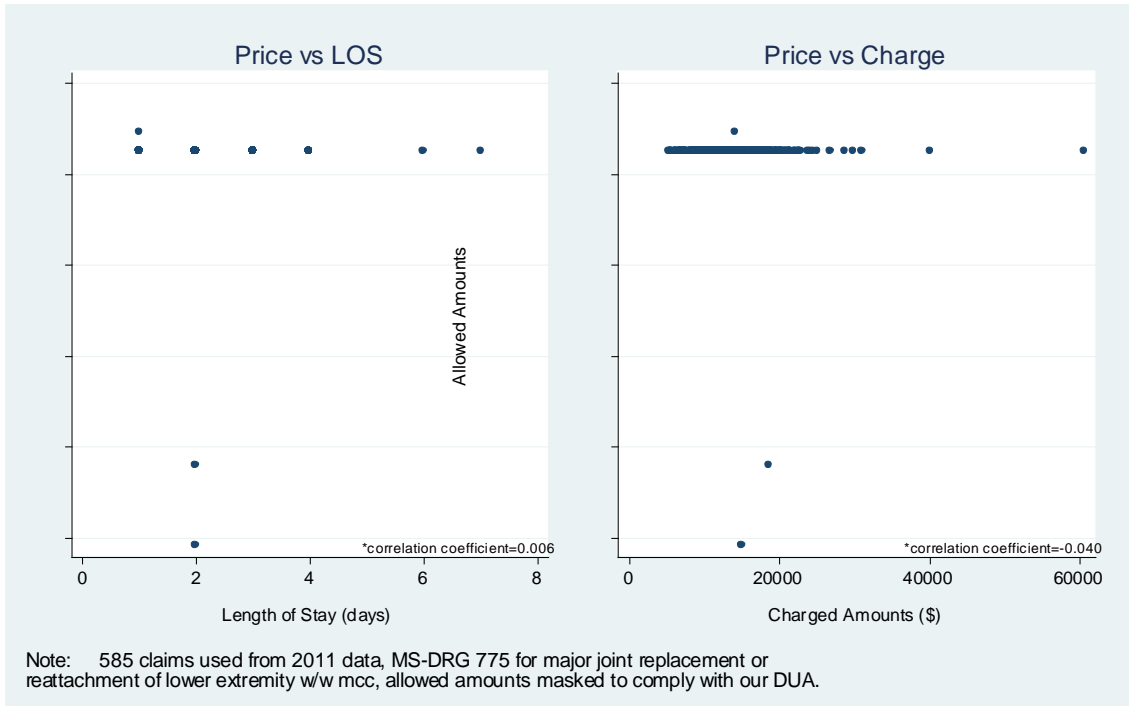
Appendix Figure 3-b. Per Diem Contract-Example 2



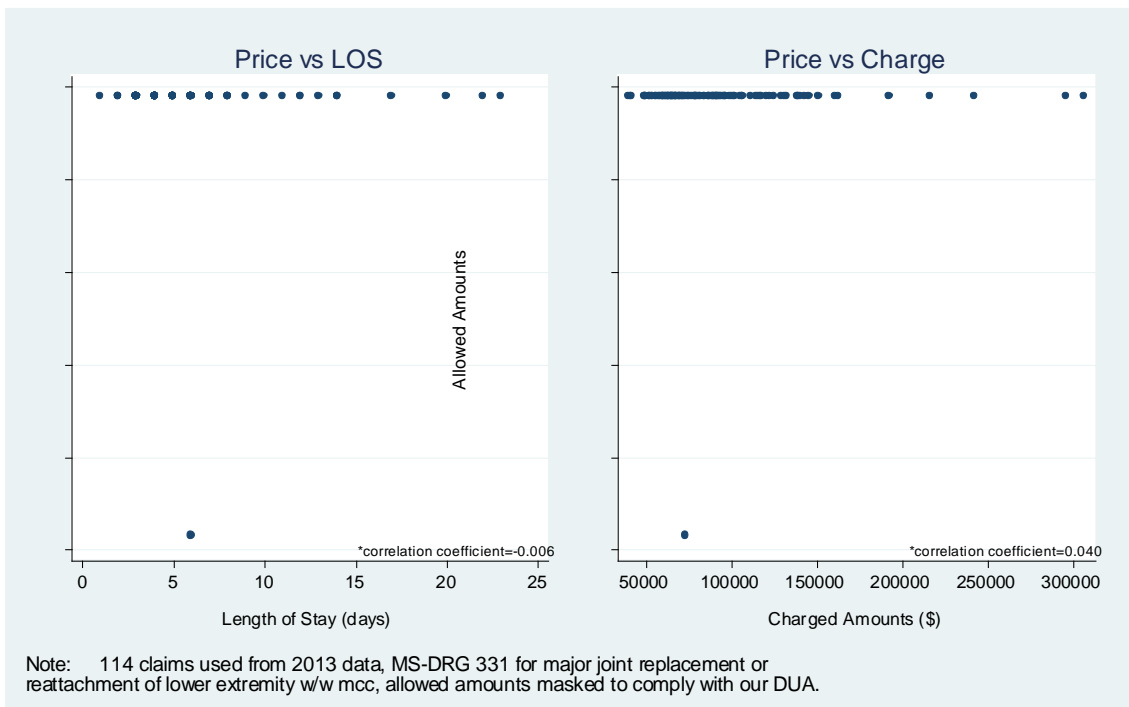
Appendix Figure 3-c. Per Diem Contract-Example 3



Appendix Figure 4-a. Fixed Rate Contract-Example 1



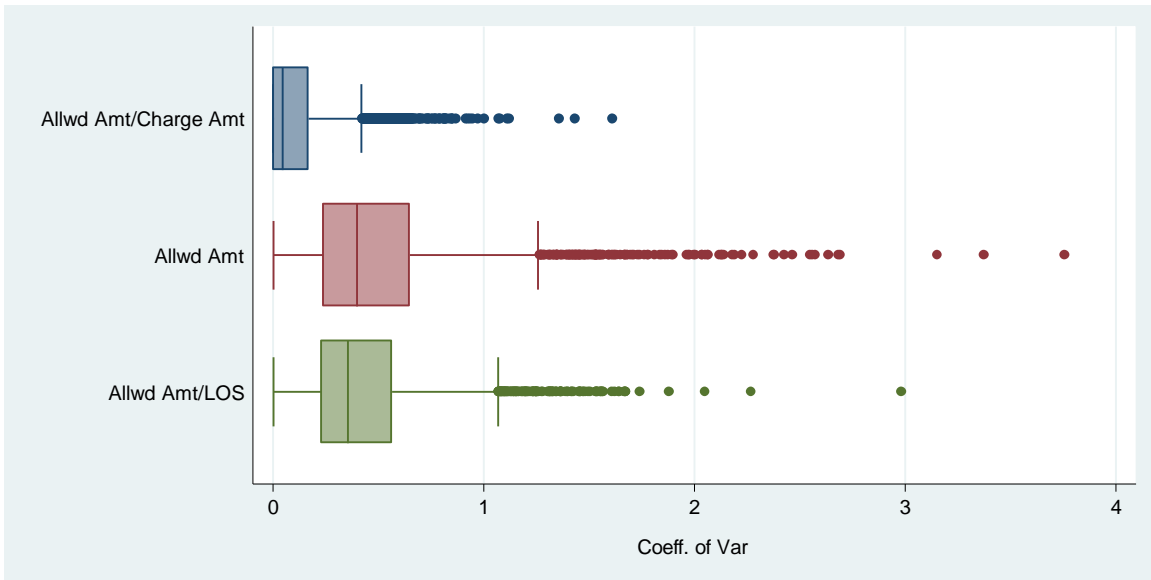
Appendix Figure 4-b. Fixed Rate Contract-Example 2



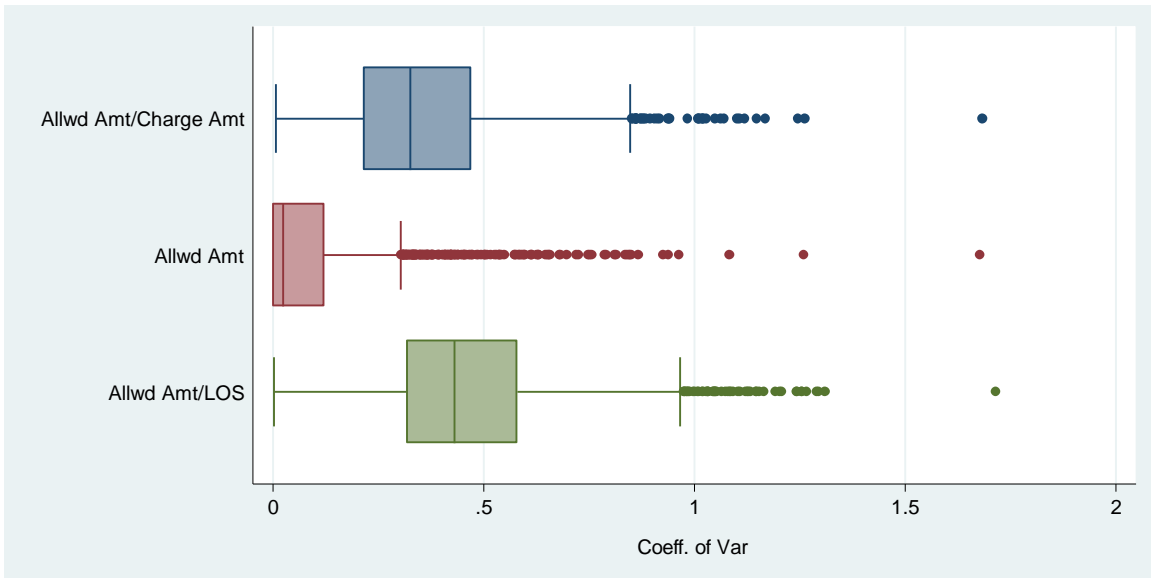
Appendix Figure 4-c. Fixed Rate Contract-Example 3



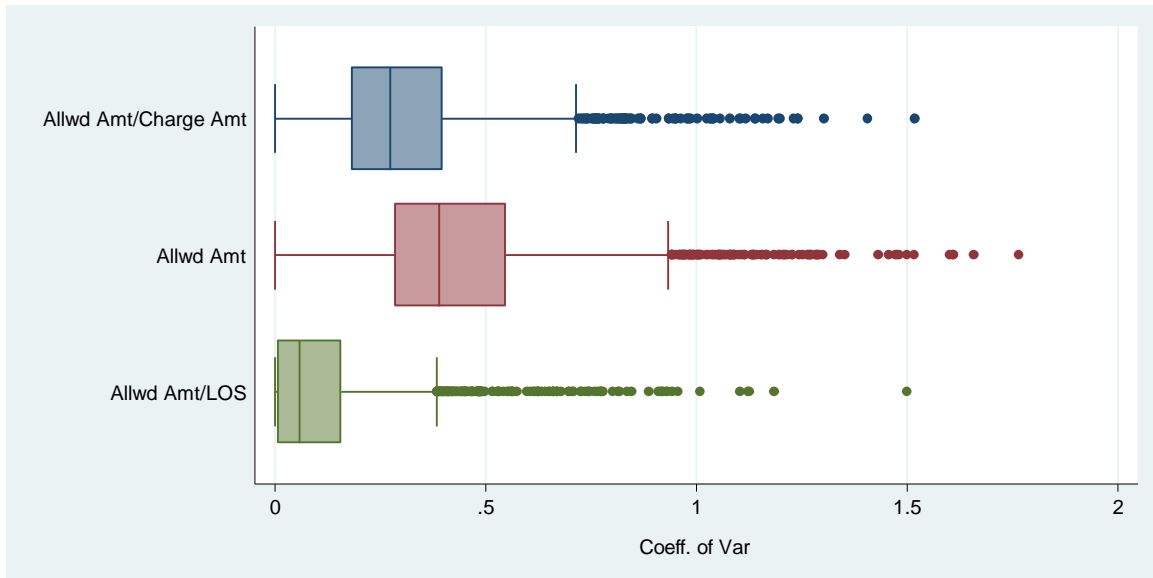
Appendix Figure 5-a. Distribution of CV for Discounted Charge Contracts



Appendix Figure 5-b. Distribution of CV for Fixed Rate Contracts



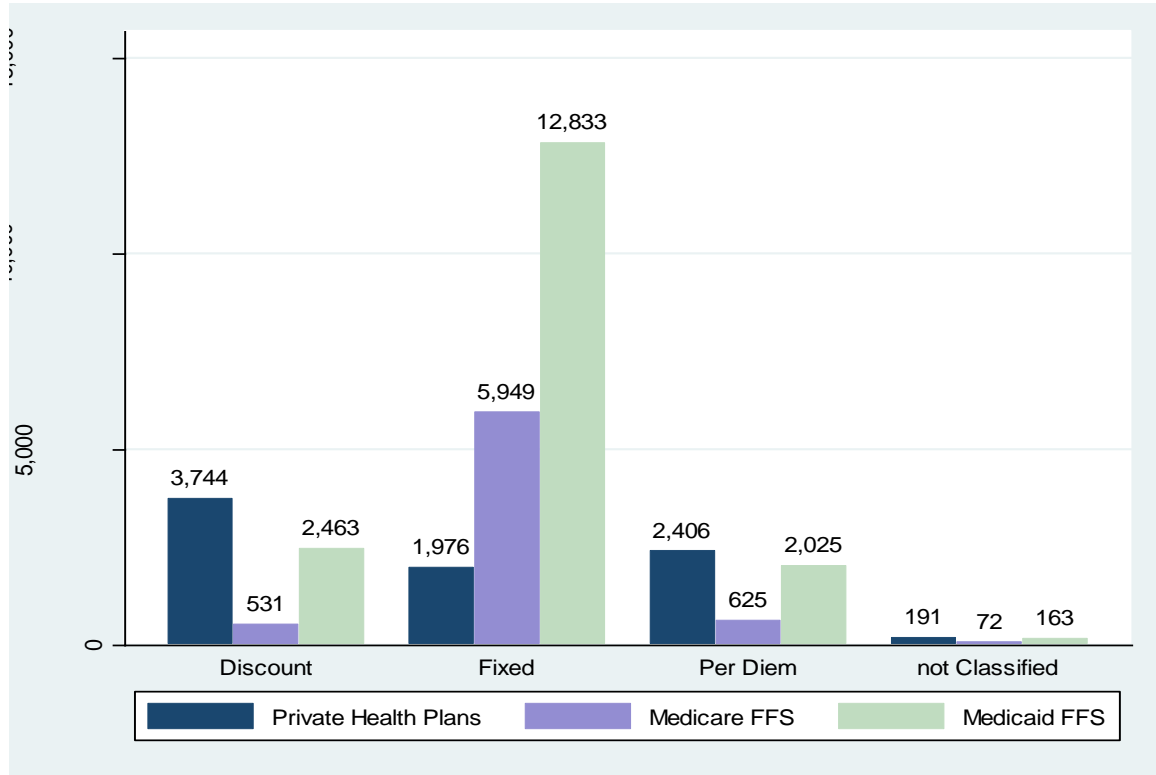
Appendix Figure 5-c. Distribution of CV for Per Diem Contracts



SOURCE Authors' analysis of CO APCD data for January 2009-December 2014.

NOTES These figures show box-and-whisker plots of CVs for all three empirical constructs, depending on whether the quad was ultimately classified as discounted charge, fixed rate, or per diem.

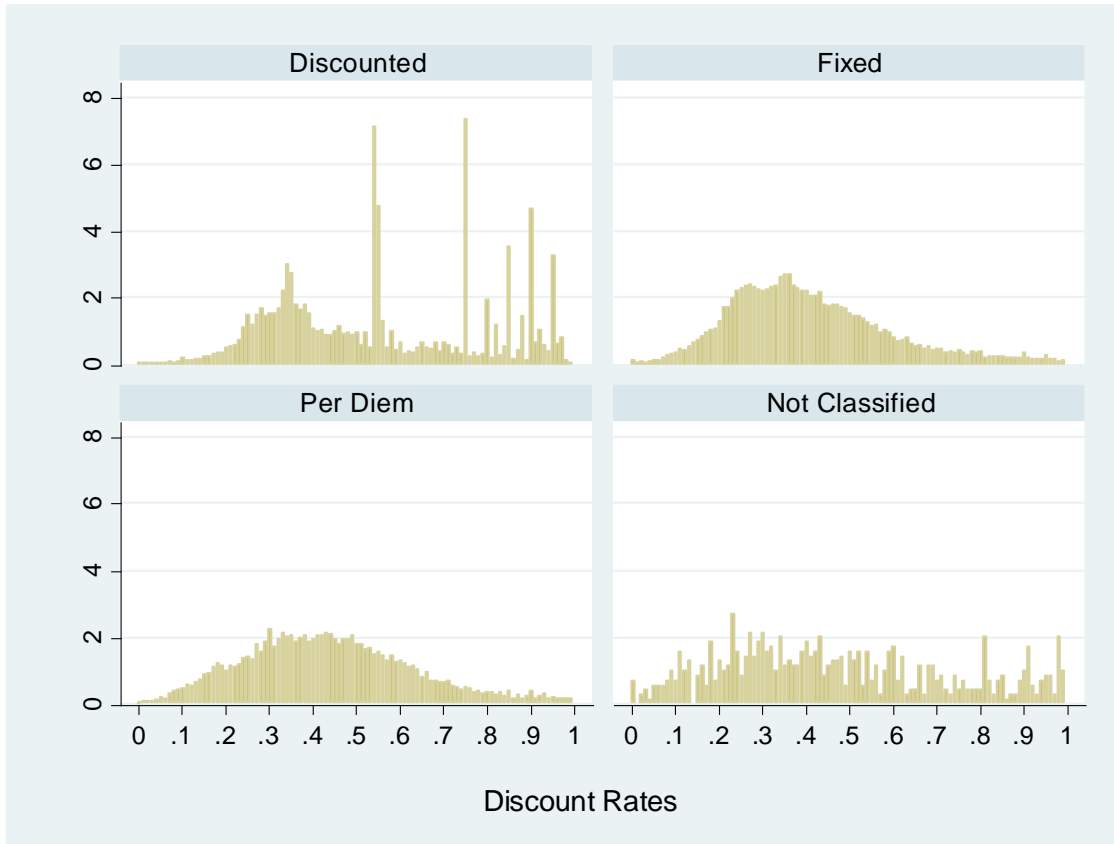
Appendix Figure 6. Results from Algorithm by Quads



SOURCE Authors' analysis of CO APCD data for January 2009-December 2014 and MEDPAR's Colorado Medicare Fee-For-Service claims for January 2014-December 2014.

NOTES Quads are defined as a combination of hospital-health plan-year-procedural groups in our sample. This figure represents the number of quads within each contract type identified using the algorithm outlined in the methods section.

Appendix Figure 7. Distribution of Discount Rates by Contract Type in Private Health Plans



SOURCE Authors' analysis of CO APCD data for January 2009-December 2014.

NOTES The discount rate is calculated at the ratio of the allowed amount to the charge amount. Claims are classified as discounted, per diem, fixed rate, or not classified by the algorithm outlined in the methods section.