Online Appendix to Bundorf, Levin and Mahoney
"Pricing and Welfare in Health Plan Choice"

This Appendix compares our demand estimates to the broader literature on health plan choice, and discusses alternative specifications of the demand and cost models.

Comparison to Demand Estimates in Other Settings

As reported in Table 3, we find that on average a $100 dollar increase in the annual enrollee contribution decreases market share by 7 to 9 percent. Studies in similar settings vary in their method for reporting elasticities. Following Chernew et al. (2007), we reconcile the estimates of price elasticity across studies by converting them to semi-elastiticies (calculated as the percent change in market share in response to a $100 increase in the employee contribution). Because the studies cover different time periods, we adjust the change in the employee contribution for inflation. After making these adjustments, most studies estimate semi- elastiticities in the range of -1.5 to -4.3 for the main specifications (Chernew et al., 2007; Scanlon Chernew et al., 2002; Strombom, et al., 2002; Wedig and Tai-Seale, 2002; Cutler and Reber 1998). Estimates from Royalty and Solomon (1999) are somewhat higher (ranging from -2.4 to -9.6 for the main specifications and even higher in some models). Similarly, Jin and Sorensen (2005), who analyze retirees, have an estimate that implies a semi-elastiticity of -9.0.

Alternative Specifications of the Demand Model

As we discuss in the main text, the estimates of risk and price elasticity are key parameters for our welfare calculations. Table A1 provides additional estimates of the demand model to examine the sensitivity of these parameters. Column 1 of Table A1 repeats the first specification of Table 3 as a baseline. This specification pools data from enrollees in different coverage tiers, increasing the sample size and generating additional variation in plan contributions due to the higher pass-through rates for dependent coverage tiers, but requires us to make assumptions about household aggregation. We test whether our estimates are sensitive to these assumptions by restricting the sample to employees purchasing employee-only coverage (Column 2) and controlling for family structure in our full-sample specification (Column 3). Both variations give similar results to our baseline specification (Column 1). While the estimate of the effect of being a high risk individual on demand

for the network PPO is smaller in magnitude in the employee-only sample (Column 2), the estimate is imprecise likely because it is identified by a small number of enrollees. When we include controls for family structure in the model estimated on the full sample, we find that families with a spouse seem to prefer the PPO relative to the average household (Column 3).

As discussed in Section 4.2, we develop different instruments to exploit alternative sources of identifying variation in employee contributions, testing the robustness of our estimates to different exogeneity assumptions. In Table 3 (Columns 2 and 3), we demonstrate that the estimate of the price effect is robust to across-plan variation in employer contribution setting. To address the concern that employer contribution rates may be systematically influenced by employee preferences, we instrument for employee contributions with a variant of the contribution model in which the the pass-through coefficients are restricted to be identical across firms (Column 4). We view the concern that insurer bids are correlated with household preferences to be diminished because of the limited information insurers have in our setting. Nevertheless we report a specification where we include predicted bids in the contribution model (Column 5). The results from both these specifications are similar although with larger standard errors.

Finally, we note that while we present results from a relatively parsimonious model, our estimates do not appear to be sensitive to including a variety of different control variables. Additional controls we have explored include plan out-of-pocket maximums, whether a plan was offered to an employer group prior to the employer hiring the intermediary, and the average health status of an employee's co-workers.

Alternative Specifications of the Cost Model

As discussed in the main text, one potential concern with the cost estimates is that the results are excessively influenced by the firm with a particularly high average risk score. To examine this issue, we have re-estimate the cost model dropping the two insurer cost and three plan bid observations from this firm. As shown in Table A2, the baseline estimates (Column 1) are very similar to the estimates that exclude these observations (Column 2).

References

Chernew, M., G. Gowrisankaran, and D. P. Scanlon, "Learning and the Value of Information: Evidence from Health Plan Report Cards," Working Paper, 2007.

Jin, G. Z. and A. Sorensen, "Information and consumer choice: The value of publicized health plan ratings." *Journal of Health Economics,* 2005, 25(2):248-75.

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Scanlon, D. P., M. Chernew, C. McLaughlin, and G. Solon, "The Impact of Health Plan Report Cards on Managed Care Enrollment," *Journal of Health Economics,* 21, 2002, pp. 19-41.

Wedig, G. J. and M. Tai-Seale, "The effect of report cards on consumer choice in the health insurance market." *Journal of Health Economics*, 21, 2002, pp. 1031-48.

Table A1: Alternative Demand Model Specifications

		Family structure		Alternative instruments	
	Baseline	Employees	Family interactions	Constrained	Predicted
	(1)	(2)	(3)	(4)	(5)
Rescaled coefficients					
Contribution	-1.00	-1.00	-1.00	-1.00	-1.00
	(0.28)	(0.36)	(0.26)	(0.95)	(1.11)
Coinsurance (percent)	1.91	0.95	1.73	2.48	1.82
	(0.49)	(0.47)	(0.44)	(1.81)	(0.74)
Deductible	-0.01	0.01	-0.01	-0.02	0.00
	(0.02)	(0.02)	(0.01)	(0.04)	(0.04)
NHMO					
X Risk score	-1.24	-1.40	-1.63	-1.64	-0.83
	(3.40)	(3.05)	(3.08)	(3.42)	(4.72)
X Age	1.75	1.35	1.49	2.31	1.34
	(0.27)	(0.27)	(0.29)	(0.30)	(0.16)
X Female	4.93	5.67	1.54	5.64	15.13
	(9.18)	(7.49)	(8.20)	(11.48)	(18.47)
X High risk	-21.27	-15.06	-14.80	-28.53	-13.92
	(12.76)	(13.18)	(11.62)	(12.32)	(16.02)
X Spouse			-15.35		
			(8.57)		
X Child			-0.65		
			(10.43)		
NPPO					
X Risk score	-11.07	-1.04	-8.43	-14.27	-10.61
	(6.76)	(4.84)	(5.86)	(7.45)	(7.27)
X Age	0.75	-0.02	0.62	1.00	0.41
	(0.45)	(0.46)	(0.47)	(0.65)	(0.37)
X Female	-34.64	-15.70	-27.14	-44.26	-31.96
	(14.36)	(12.14)	(13.43)	(14.8)	(11.78)
X High risk	49.38	7.45	36.23	64.09	46.29
	(19.87)	(21.35)	(17.83)	(19.53)	(23.93)
X Spouse			31.86		
			(13.45)		
X Child			-13.34		
			(16.80)		
IPOS					
X Risk score	-6.10	-4.83	-6.25	-8.03	-4.70
	(5.41)	(5.05)	(4.94)	(5.09)	(2.80)
X Age	1.58	0.91	1.20	2.09	1.19
	(0.39)	(0.40)	(0.41)	(0.38)	(0.26)
X Female	-35.24	-25.67	-33.33	-46.64	-23.94
	(12.85)	(10.13)	(11.34)	(14.08)	(7.65)
X High risk	16.40	24.60	20.97	21.28	15.68
	(17.28)	(19.16)	(15.93)	(16.68)	(11.65)
X Spouse			-13.01		
			(11.43)		
X Child			-9.49		
			(14.33)		
σ_ϵ	109.29	81.66	97.46	145.13	119.91
	-	-	-	-	-
N	3683	2252	3683	3683	3683
Semi-elasticities					
NHMO	-0.09	-0.08	-0.09	-0.05	-0.06
NPPO	-0.10	-0.10	-0.10	-0.05	-0.05
IHMO	-0.05	-0.05	-0.05	-0.08	-0.09

Notes: Baseline (1) repeats the non-IV specification of Table 4. Family structure is examined in specifications (2) and (3). In Employees (2), the baseline model is estimated on the subsample of employees who enrollee as individuals. In Family Interactions (3), spouse and child by plan interactions are added to the baseline specification. Alternative instruments are examined in specifications (4) and (5) . In (4) we instrument using predicted plan contributions but constrain the parameters in the contribution model to be constant across firms. In (5) the predicted contribution equation is estimated using predicted bids. See Section 4.2 for details. Standardized coefficients are normalized by the coefficient on monthly contributions. The dependent variable is a dummy variable for the plan chosen. IHMO is the omitted category. Contribution is in tax adjusted dollars and coinsurance is in percentage points. Plan fixed effects, income and a dummy variable for nonstandard prescription drug coverage are included but not shown. Semi-elasticites are the percent change in market share for a hundred dollar increase in the annual premium, calculated as $(100 X \text{MarginalEffect})/(12 X \text{MarketShare})$ in percent. The standard deviation of the logit error (σ_ϵ) is not an estimated parameter and does not have a standard error.

Table A2: Alternative Costs and Bids Specifications

	Baseline (1)	Dropping outlier (2)
Network insurer markup	1.27	1.27
	(.09)	(.06)
Integrated insurer markup	1.07	1.07
	(.03)	(.03)
NHMO	195.04	195.42
	(11.57)	(8.81)
X (Risk score - 1)	272.77	264.78
	(59.98)	(23.51)
X Coinsurance	-1.01	-0.33
	0.90	(.92)
NPPO	203.27	205.73
	(12.)	(9.13)
X (Risk score - 1)	154.06	162.75
	(38.7)	(22.82)
X Coinsurance	1.25	1.33
	1.22	(1.22)
IHMO	226.47	227.70
	(5.87)	(6.45)
X (Risk score - 1)	111.64	107.03
	(26.85)	(18.08)
X Coinsurance	0.75	0.52
	0.33	(.43)
IPOS	218.39	217.01
	(12.76)	(12.36)
X (Risk score - 1)	385.89	394.65
	(63.91)	(60.94)
X Coinsurance	1.86	1.63
	(5.62)	(5.73)
N	91	86

Notes: Baseline (1) repeats the specification shown in Column (2) of Table 4. Dropping outlier (2) shows the same specification dropping the firm (i.e., 3 plan bids and 2 insurer costs) with the largest risk score. GMM estimates of cost parameters. See text for details. Coinsurance is de-meaned at the plan level.