AN INDIVIDUAL HEALTHPLAN EXCHANGE: WHICH EMPLOYEES WOULD BENEFIT AND WHY?

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On average, U.S. workers fortunate enough to be offered health insurance through their place of work are given a small number of choices: 80 percent of firms, accounting for 37 percent of workers, were offered only one plan in 2005. Although there are merits of limited choice – including lower administrative costs for sponsoring employers, and better pooling of risk within a given employee population – substantial consumer surplus is foregone by preventing employees from selecting plans that best suit their needs.

In Dafny, Ho, Varela (2010), we build a model to quantify this deadweight loss. Using data on plan offerings and enrollment for 800+ large U.S. firms in 139 geographic markets, over the period 1998-2006, we estimate a model of consumer preferences for characteristics of health plans. We use the parameters of that model to predict employee choices under different hypothetical scenarios of expanded choice, assuming employers' total outlays for health insurance remain constant and plans are made available to new enrollees at "large group rates." We quantify those gains for each employee group-year we observe (for example, Big Box Retailer's employees in Houston in 2003), and conclude these gains are sizeable compared to average premiums. We estimate that employees would be willing to forego 10 to 40 percent or more of their employer subsidies for the right to apply those subsidies to the plan of their

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choosing, with the exact magnitude depending on the demand specification as well as the definition of the expanded choice set.

In this paper, we evaluate the distributional effects of expanding options to workers who are offered employer-sponsored insurance, and explore the differences between plans that are offered to workers and those they would select if they were permitted to purchase them on the same terms. In particular, we document differences in the magnitudes of estimated consumer surplus gains by family size of the average employee, by size of the employer, and by the original choice set offered by the employer. We also compare premiums, carrier identities, and plan types of plans actually offered and plans that would be preferred in our hypothetical choice-expanding scenario, which we call "plan swapping." In this scenario, the *number* of options available to a given employee group remains the same as observed in the data, but we swap in plans that employees would have preferred over their actual choices. Note these plans *were* actually offered by other employers in the relevant marketplace; we do not change the set of potential plans from which employers may choose. This scenario is conservative in many respects – for example it precludes gains from variety – but it eliminates the well-known automatic surge in utility associated with additional options in logit choice models, and also highlights the fact that employers are not selecting the plans that their employees would prefer most, *even* holding constant the small number of plans they offer. We discuss possible reasons why employer choices are not perfectly aligned with employee preferences and propose ideas for future related research.

I. Data and Background: Quantifying the Gains from Choice

In this section, we describe the construction of our key variable of interest: the utility gain associated with plan swapping, which is projected separately for each employee group in our sample and measured in year 2000 dollars. These figures are generated by the model developed in Dafny, Ho and Varela (2010), which is estimated using a proprietary database called the Large Employer Health Insurance Dataset (LEHID).

LEHID includes detailed information on the healthplans offered by an unbalanced panel of large, multi-site employers from 1998-2006. The unit of observation is a plan-year, where a plan is defined as a unique combination of an employer, geographic market, insurance carrier and plan "type" (HMO, POS, PPO and indemnity). Plans may be fully-insured (the carrier bears medical risk) or self-insured (the employer bears medical risk). The LEHID dataset includes the healthplans of over 10 million Americans in each year in the sample. The dataset, which is described in greater detail in Dafny (2009), is representative of large-firm coverage nationwide.

Of primary interest for this study is the choice set offered to employee groups, defined as an employer-market-year triple. Slightly fewer than half of these groups are offered a single plan. Over 75% have at most two from which to choose. Half of the two-plan choice sets include an HMO and a PPO; 14% are offered a POS plan and a PPO.

Our approach to calculating utility gains consists of three distinct steps. First, we estimate a discrete choice model of consumer demand for healthplans using the LEHID sample. This model yields parameter estimates that reflect consumer preferences over plan characteristics such as price (the employee contribution for each plan), carrier identity, plan type, and plan design (a summary measure provided by our source which captures plan generosity as reflected,

for example, by copayments). Our utility model also includes fixed effects for important correlates of utility, such as year, market, and the industry of the employer, as well as several interactions among the set of included variables.[1] The results are intuitive: the implied price elasticities, which vary by industry and family size, are all significant at $p<0.05$ and fall in the middle of the range of estimates from other studies of healthplan choice.[2]

Next, we estimate a rich hedonic model to predict the (employer and employee) premium each employer group would face for each plan that is offered in the relevant market-year. Simply using the average of observed premiums for each plan would be undesirable because premiums vary with the composition of the relevant employee population. We do not expect our estimates to approximate the premiums that would actually prevail on an "exchange" for individually-purchased plans; the reduction in group size is likely to lead to price increases. Instead we use our predicted premiums to estimate the increase in consumer surplus from expanding choice with continued price-setting at the employer-market-year (or "large group") level.

Finally we use the parameter estimates from the demand model, together with the predicted premiums from the hedonic model, to predict employee choices and the resulting consumer surplus under expanded consumer choice. Because our utility equation includes a logit error term which has unbounded support, expanding the choice set to include *all* observed healthplans in each market-year would overestimate the value to consumers of increased choice. In Dafny, Ho and Varela (2010) we provide estimates from three scenarios that represent a lower bound, a middle-ground estimate and an upper bound of the value of greater choice. In all

[1] These interactions include market-carrier, market-plan type and plan type-year interactions, interactions between the plan type-year dummies and dummies for the 19 industry categories in the dataset, interactions between plan design and industry dummies, and interactions between price and: average family size, industry category dummies, and average family size*industry category dummies.

[2] Examples of the previous literature include Chernew, Frick and McLaughlin (1997), Cutler and Reber (1996), Royalty and Solomon (1999), and Gruber and Washington (2003). The estimated elasticities fall in a broad range from -0.02 to less than -1. Our estimates (which vary by industry, family size, and model specification) are all between -0.05 and -0.59.

scenarios, we reduce the influence of outliers on our findings by censoring predicted premiums and estimates of unobserved quality at the fifth and ninety-fifth percentiles of their distributions. As noted earlier, here we focus on estimates from the plan swapping scenario, the most conservative simulation. The median utility gain from expanded choice in this scenario translates into approximately $500 per person (not including other family members) per year, in pre-tax dollars.

II. Identifying Correlates of Welfare Gains

We now present several analyses to evaluate the distributional impact of the expansion of choice: which types of employees gain the most? We begin by quantifying the utility gains for each original choice set. The results are provided as Table 1 in the online appendix. Employees who were initially offered a single indemnity plan (4% of groups) gained the most at $928 per person per year; the next biggest winners were those offered one PPO (26% of the data) or an HMO and a PPO (12%). Overall, employees who were already offered a POS plan typically gained less than those restricted to choosing from other plan types, even if the choice set of those with a POS option was smaller.

Next we summarize median utility gains by "effective family size" (which is constructed by our source and captures not only the average family size of enrollees but also differences in gender and age profiles), by firm size and by original premium level. We note several findings (see Table 2 of the online appendix for details). First, employee groups with families below the median family size gained more than those with larger families. Second, employees of smaller firms enjoyed larger average gains. Finally, employees with lower initial prices gained somewhat less on average than those initially facing higher prices, a point we expand upon in Section III below.

Finally, we investigated the robustness of the tabulations by estimating regression models that include all of the covariates jointly; results are available in Table 3 of the online appendix. In these models, the dependent variable is logged utility gains at the employer-market-year level and the independent variables include indicators for the initial choice set, initial premium quartile, family size quartile, firm size quartile, and individual years. We also consider specifications with employer, market and market-year fixed effects.[3] The results are generally consistent with the patterns described above. We also find the utility gains from increased choice declined in almost every year from 1999 to 2006. There are a number of possible reasons for this trend, including the possibility that insurer consolidation has limited the variety of plans available over time – thereby reducing potential gains from enabling employees to select preferred plans – or that employers are learning over time how to select plans that match their employees' tastes. In the section that follows, we evaluate the dimensions along which employer and employee preferences differ, and discuss possible reasons for the observed misalignment.

III. What Plans do Employees Prefer, and Why Don't Employers Offer Them?

The results we present reveal that, on average, employers generate substantial amounts of deadweight loss by offering the "wrong" plans from their employees' perspective. Prior research based on employer survey data suggests that employers overweight premiums in their decisions, emphasizing price over quality (James Maxwell, Peter Temin, and Corey Watts 2001). To examine this hypothesis, Table 1 presents the distribution of the change in premiums before versus after the expansion of choice. The table offers little support for this hypothesis: nearly two-thirds of employee groups prefer plans within 5 percent of their original premiums. The

[3] We censor utility gains at the 5th and 95th percentiles before taking logs to ensure that the results are not heavily influenced by outliers.

proportion of groups preferring significantly pricier plans (>10 percent increase in premiums) is only 7 percent, and matches the proportion preferring significantly cheaper plans (>10 percent decrease in premiums).

Table 1: Distribution of Change in Premiums with Expansion in Choice

Percent change in premiums	Percent of employer-market-years
< -10 percent	0.07
-10 to -5	0.11
-5 to 0	0.27
0 to 5	0.37
5 to 10	0.12
> 10 percent	0.07

Note: For employee groups with more than one plan, premiums are enrollee-weighted averages.

The similarity of premiums between observed and preferred plans implies employers and employees differ in their preferences across other plan dimensions, such as plan design, unobserved quality, plan type, and carrier identity. We can investigate these differences by comparing the characteristics of plans currently offered to consumers (which reflect employer preferences – or to be more precise, some combination of employer preferences and employers' assumptions regarding employee preferences) to those of plans swapped into the choice set in our counterfactuals (which reflect employee preferences). Our simulations are ill-suited to examining differences in preferences over plan design and unobserved quality, as in the interest of computational feasibility all plans "swapped in" are automatically assigned mean and median values for these terms within the relevant market-carrier-plan type and year, respectively. However, we can investigate differences in employer and employee preferences for plan types and carriers.

Consistent with the findings from the previous section, we find that POS plans are much more likely to appear in the new choice sets than in the observed data. The implication is that

employees find the POS plan type especially more attractive than employers do, and/or than employers think they do. Finally, Table 2 summarizes the distribution of carriers by plan type before and after plan swapping. It suggests employees are particularly fond of the POS plans offered by local Blue Cross Blue Shield affiliates and Aetna. Employees also prefer Blue Cross Blue Shield plans of all plan types relatively more than their current choice sets reflect, and the same is true for United HMO plans.

Table 2: Distribution of Carriers, Observed Data and Counterfactual

	Observed				***Counterfactual***			
	BCBS	**Aetna**	**United**	**Other**	**BCBS**	**Aetna**	**United**	**Other**
HMO	0.17	0.12	0.09	0.63	0.25	0.10	0.12	0.53
IND	0.13	0.18	0.29	0.39	0.41	0.07	0.17	0.35
POS	0.08	0.23	0.30	0.39	0.17	0.26	0.27	0.31
PPO	0.34	0.18	0.20	0.28	0.39	0.12	0.13	0.36

Collectively, our analyses imply that employees would like more value for their (tax-free) dollars. Given free choice, they would select a plan with the same total price tag, but with different features, including plan type and carrier identity. We underscore these plans *are* available in the relevant markets; they are simply not included in employees' choice sets.

The tables are silent with regard to *why* employers' revealed preferences are not perfectly aligned with those of their employees. There are several candidate explanations, including: switching costs for employees and decisionmakers; a lack of information about employee preferences; misalignment of decisionmakers' preferences and those of the average employee, which includes the possibility that certain carriers offer attractive services to benefits administrators which are not valued directly by employees; inability to negotiate "market rates" for all plans as assumed in our simulations. Assessing the relative importance of these explanations is beyond the scope of this paper, but it is an interesting subject for future research.

IV. Conclusions

The current incarnation of employer-sponsored insurance in the U.S. is characterized by very limited choice. In Dafny, Ho and Varela (2010) we use a large panel of employer health plan offerings and employee choices to estimate the gains in consumer surplus from counterfactuals that increase choice. In this paper, we consider who would gain from expanded choice, and we evaluate explanations for why employers appear to leave surplus on the table by offering suboptimal plans from the perspective of their employees.

Unsurprisingly, we find gains would likely be largest among employees currently offered only one option (even though the conservative counterfactual we study restricts these employees to a single option as well), and among employees who currently face the highest premiums. However, we also uncover some unexpected results, including the fact that employees would not, on average, select more expensive plans than employers are currently offering, but would instead choose plans with different characteristics. In particular, current choice sets do not reflect the strength of employee preferences for POS plans, or for plans of all types offered by Blue Cross Blue Shield affiliates.

Given that employer-sponsored health insurance is likely to persist in the U.S. for the foreseeable future, research that examines disparities between what employers offer and what employees want is a valuable first step in identifying how to diminish them. Of course, the extent to which this is desirable depends on whether employers would lose surplus from offering these plans, and other partial and general equilibrium implications of such changes (for example, how expanded choice sets affect risk pooling within an employer group, and the labor-market implications of such changes). A rigorous consideration of these and other determinants of employer plan selection would be a valuable next step in this agenda.

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ONLINE APPENDIX FOR "AN INDIVIDUAL HEALTHPLAN EXCHANGE: WHICH EMPLOYEES WOULD BENEFIT AND WHY?"

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Table 1: Median Utility Gains by Original Choice Set

Choice Set	Share of Employer Groups	Median Gain
1 PPO	0.26	532
1 POS	0.08	375
1 HMO	0.06	490
1 IND	0.04	928
HMO+PPO	0.12	536
HMO+POS	0.04	452
POS+PPO	0.03	334
2 PPO	0.02	445
2 HMO	0.01	331
Others	0.33	507

Notes: Distribution of utility gains from expanded choice, estimated using model developed in Dafny, Ho and Varela (2010). Column 1 notes the percent of employee groups offering a particular menu of plans and column 2 displays the median utility gain in year 2000 dollars. Values are per effective enrollee, and expressed in year 2000 dollars.

Table 2: Median Utility Gains, by Various Characteristics of Employee Groups

	By Family Size	By Firm Size	By Original Premium Level
Bottom quartile	581	577	419
2nd quartile	639	529	479
3rd quartile	506	486	508
Top quartile	367	448	654

Notes: Column 1 summarizes median utility gains by effective family size (which captures not only the average family size of enrollees but also differences in gender and age profiles). Column 2 summarizes utility gains by firm size and Column 3 by original premium level. Values are per effective enrollee, and expressed in year 2000 dollars.

Table 3: Correlates of Welfare Gains, Regression Analysis

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Premium quartiles						
2nd	0.38	0.19	0.32	0.17	0.33	0.17
3rd	0.67	0.34	0.57	0.31	0.58	0.31
4th	1.08	0.54	0.96	0.52	0.94	0.50
Family Size quartiles						
2nd	[0.03]	-0.14	0.05	-0.11	0.05	-0.11
3rd	-0.24	-0.36	-0.23	-0.30	-0.22	-0.30
4th	-0.62	-0.60	-0.56	-0.50	-0.56	-0.50
Firm Size (at market level)						
2nd	-0.31	-0.23	-0.33	-0.28	-0.33	-0.27
3rd	-0.46	-0.26	-0.53	-0.38	-0.53	-0.38
4th	-0.54	-0.30	-0.68	-0.51	-0.69	-0.51
Initial Choice Set						
1 POS	-0.62	-0.68	-0.78	-0.88	-0.77	-0.85
1 HMO	-0.37	-0.59	-0.44	-0.67	-0.44	-0.67
1 IND	0.53	0.56	0.82	0.88	0.80	0.86
HMO+PPO	0.90	0.78	0.78	0.67	0.79	0.68
HMO+POS	0.61	0.38	0.43	0.21	0.44	0.23
POS+PPO	0.52	0.59	0.42	0.43	0.42	0.44
2 PPO	0.61	0.90	0.58	0.81	0.57	0.79
2 HMO	[0.04]	-0.16	[0.00]	-0.22	[0.01]	-0.21
Others	1.01	0.86	0.95	0.78	0.95	0.79
Year dummies						
1999	[0.02]	0.13	[0.04]	0.13		
2000	-0.17	-0.10	-0.13	-0.08		
2001	-0.18	[0.00]	-0.12	[0.03]		
2002	-0.33	-0.09	-0.24	[-0.06]		
2003	-0.46	-0.13	-0.36	-0.09		
2004	-0.68	-0.30	-0.55	-0.26		
2005	-0.75	-0.34	-0.62	-0.30		
2006	-1.07	-0.59	-0.91	-0.52		
Employer FEs		X		X		X
Market FEs			X	X		
Market-year FEs					X	X

Notes: Coefficient estimates from OLS regression of logged utility gains at the employer-market-year level on covariates. Utility gains are censored before taking logs. Omitted category for initial choice set is "1 PPO"; for year dummies is 1998. All coefficients are significant at p=0.05 except those in parentheses.