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Tax Subsidies for Out-of-Pocket Healthcare Costs

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Abstract

Health Savings Accounts (HSAs) subsidize healthcare expenditures that are not covered by insurance including copayments, deductibles, and other uncovered items. To qualify for the accounts, participants must purchase insurance with high deductibles, exposing them to higher out-of-pocket costs. This requirement may be immaterial to the diffusion of HSAs, if such a subsidy would induce employers to offer and employees to purchase high-deductible health insurance anyway. However, if the subsidy does not lead people to voluntarily choose high-deductible plans, then the requirement that they do so may deter HSA take-up.

In this paper we examine Flexible Spending Accounts (FSAs), which similarly subsidize out-of-pocket healthcare costs, but do not compel participants to purchase high-deductible insurance. Our intent is to shed light not only on employer and employee behavior with respect to FSAs but on HSAs as well. Overall, we find some evidence that coinsurance rates are higher for establishments with FSAs. However, we find no evidence of an FSA effect for copayments or the actuarial value of a health insurance plan. We find mixed evidence with respect to deductibles. While our results suggest that FSAs are associated with plans having a positive deductible, we find no effect in a model of continuous deductible levels.

Tax Subsidies for Out-of-Pocket Healthcare Costs

1. Introduction

The 2003 Medicare Modernization Act created a new subsidy for healthcare costs, Health Savings Accounts (HSAs), tax-sheltered savings accounts into which people can set aside pre-tax earnings to be spent on healthcare costs not covered by their insurance policies. To qualify, participants must be covered by a high deductible health plan, exposing them to higher out-of-pocket costs.[1] This requirement may be immaterial to the diffusion of HSAs, if such a subsidy would induce employers to offer and employees to purchase high-deductible health insurance anyway. Alternatively, if the subsidy does not lead people to voluntarily choose high-deductible plans, then the requirement that they do so may deter HSA offers by employers and take-up by employees.

While HSAs themselves are new, subsidies for out-of-pocket expenditures have existed since 1978 in the form of Flexible Spending Accounts (FSAs). FSAs, like HSAs, allow employees to set aside pre-tax earnings to be spent on out-of-pocket healthcare costs. However, these accounts differ from HSAs in several important respects. First, FSA funds not spent at year's end are forfeited, unlike HSAs whose funds can be carried over to the next year[2]. Next, FSAs are only available through employers. Perhaps most importantly, FSAs place no restrictions on the health insurance of account holders while HSAs must be paired with a high deductible plan.

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[1] The pairing of an HSA with a high deductible plan is sometimes referred to as a Consumer Driven Health Plan (CDHP).

[2] Since unused funds are forfeited, individuals need to predict their medical expenditures for the year in order to make FSA allocations. If they use more medical care than expected, then those additional out-of-pocket costs would not be subsidized through the FSA. If they use less, then they face incentives to accelerate expenditures near the end of the year. (Recent changes allow unused FSA contributions to be rolled over for a 2 1/2 month grace period in the next year.) In this paper we don't address these non-linearities and treat the deduction of out-of-pocket expenses as open-ended.

In this paper, we examine the effect of FSAs on health insurance plan generosity. Our intent is to shed light not only on FSAs but on HSAs as well. In particular, we examine the degree to which the availability of FSAs has affected the coinsurance and copayment rates for physician office visits, the level of overall deductibles, and a summary measure of generosity for plans. Our results on deductibles, in particular, may shed light on HSAs and whether the pairing of tax sheltered accounts with a high deductible would have arisen as a result of market forces.

Recent work suggests that consumers respond to tax subsidies for out-of-pocket expenses by purchasing less generous insurance. Hamilton and Marten (2008) find that employees who participate in FSAs choose insurance plans with higher expected out-of-pocket costs. However, since Hamilton and Marten focus on the employees of one large employer, they cannot say whether the availability of FSAs changes the menu of insurance plans offered to those employees.

Jack *et al.* (2006) use data from the Robert Wood Johnson Employer Health Insurance Survey (EHIS), a cross sectional survey of insurance plans offered by employers in 10 U.S. states. They show that firms whose employees have access to FSAs offer health insurance plans with higher cost-sharing, controlling for the endogenous decision by firms to offer FSAs. However, the EHIS data come from 1993, and much about health insurance has changed since then, such as the increased availability of FSAs as well as shifts in the types of plans offered by employers.

In this paper, we update and extend the analysis in Jack, *et al*. in several ways. First, we extend the applicability of the results to a wider geographic area, from the 10 states examined in the previous study to data from a national survey of employers, the

2005 Medical Expenditure Panel Survey – Insurance Component (MEPS-IC). We also examine a wider range of cost-sharing outcomes, such as the physician copayment rate, the physician coinsurance rate and the overall deductible level. In addition, we attempt to account for the overall generosity of a health plan by examining the actuarial value of the plan, a measure that uses all available information in the MEPS-IC to calculate the percentage of total medical expenditures paid by insurance. Finally, we also attempt to differentiate between employers' decisions on which plans to offer employees and employees' enrollment decisions through the use of different survey weights in the analyses.

We find some evidence that employers that offered their employees access to FSAs in 2005 had health insurance plans with higher coinsurance rates. However, we do not find such an effect on physician copayment rates or the actuarial value of the plan. We also find mixed evidence with respect to deductibles. While we find that FSAs are associated with plans having a positive deductible, we find no effect in a model of continuous deductible levels.

2. Some intuitive theory

In simple terms, we are asking whether providing a tax subsidy for out-of-pocket healthcare expenditures alters the optimal (or market-provided) health insurance contract, leading to lower premiums and less-generous policies. The formal theory is in Jack and Sheiner (1997) and Jack *et al*. (2006). Here we simply describe the intuition.

People buy insurance because they are risk averse. Fully insured people who face zero marginal costs for health care, however, will use an inefficient excess of healthcare

due to the lack of incentives to monitor costs. To ameliorate this moral hazard, insurance contracts limit coverage, possibly by requiring consumers to pay some of the *ex post* costs. While higher cost sharing reduces moral hazard, it also increases the risk faced by the patient. The optimal insurance contract trades off these two concerns, equating the marginal disutility of increased cost sharing (from risk aversion) with the marginal efficiency gains from decreased moral hazard[3].

How do taxes affect this arrangement? Since 1954, the U.S. Internal Revenue Service (IRS) has explicitly exempted from income taxation the health insurance premiums paid by employers on behalf of their employees. This exemption subsidizes the purchase of health insurance by employees at a rate equal to their marginal income tax rate. Because only the premiums are subsidized, and not the out-of-pocket costs, the tradeoff between risk reduction and moral hazard is tilted towards risk reduction. Employees purchase employer-sponsored insurance that is more generous than would be purchased in the absence of the tax subsidy. This more generous insurance has lower cost sharing, in turn exacerbating moral hazard and inducing inefficient excess use of healthcare services (Pauly 1968; Feldstein 1973).

Two public policies now offset the distortion caused by the 1954 exemption of employer paid premiums. FSAs and HSAs subsidize out-of-pocket expenditures, meaning that both *ex ante* premiums and *ex post* cost sharing can be paid with pre-tax

[3] A recent paper by Newhouse (2006) discusses refinements to optimal cost insurance contract models to take into account the effect of adherence to treatment regimes on long term medical costs or improve health or productivity. We don't address these complexities in this paper.

dollars.[4] The subsidy to out-of-pocket cost sharing has two effects. First, it means that for a given cost-sharing arrangement, the *ex post* price of healthcare services faced by consumers is lower, increasing their use and increasing the efficiency cost from the initial subsidy on premiums. But second, by reducing employees' health care costs, the subsidy reduces the demand for insurance, increasing the desired degree of cost-sharing. That is, with out-of-pocket costs subsidized, employees will prefer to pay lower premiums in return for policies with higher (subsidized) cost sharing. This second effect, by putting more responsibility for costs in the hands of patients, decreases the moral hazard inefficiency associated with policies whose premiums are subsidized.

Because these two effects of subsidizing out-of-pocket costs work in opposite directions, the welfare consequences are uncertain.[5] Confronted with the subsidy, employees demand (and employers provide) less expensive health insurance that covers fewer expenses. If the equilibrium insurance arrangement has net-of-tax cost sharing that is lower than without the subsidy, then FSAs will have exacerbated the deadweight loss associated with the subsidy to premiums. If the net-of-tax cost sharing is higher, FSAs will have mitigated the deadweight loss from the premium subsidy.

Using data from 1993, Jack *et al.* find that controlling for the endogenous decision to provide employees with access to FSAs, the coinsurance rates for firms with FSAs were 7 percentage points higher than at firms without FSAs, relative to a sample average of 17 percent.[6] This suggests that one market consequence of the subsidy was

[4] Other similar subsidies include Medical Savings Accounts (MSAs), which are like HSAs but only available through employers, and Health Reimbursement Accounts, which are similar to FSAs except that employers finance the accounts directly, without requiring employee contributions

[5] Under certain conditions it can be shown that the increase in nominal cost sharing more than offsets the price-reducing effect of the subsidy (Jack and Sheiner, 1997).

[6] Jack *et al.* show that the net of tax coinsurance rate was the same for firms with and without FSAs, meaning that for the average worker, the FSA tax subsidy was entirely offset by an increase in cost sharing.

that employees, through their employers, chose higher cost sharing, and that requiring them to do so as a condition of eligibility for the subsidy would not be binding. Whether this remains true today, or is applicable to other cost-sharing requirements, such as deductible levels, is the subject of this analysis.

3. Testing the theory

We want to know the causal effect of tax subsidies on the cost-sharing of health insurance contracts, where the presence of a tax subsidy is measured by access to an FSA. The obvious problem confronting us is that firms choose whether or not to offer their employees access to FSAs at the same time that they decide the menu of health insurance plan characteristics. In addition, employees choose to enroll in a plan and an FSA at the same time.

This simultaneity bias may work in either direction. Some "good" employers may have generous employee benefits plans, retirement programs, childcare, and health insurance with low cost-sharing in addition to FSAs. This will likely exert a downward bias on our estimate of the effect of FSAs on cost-sharing Or, it may be that cost-sharing has been increasing for reasons such as a desire to keep health insurance premiums affordable, and employers respond to this increase in cost-sharing by offering their employees access to FSAs. If employers respond to increased cost-sharing by offering their employees access to FSAs, we could have the causality exactly backwards – we want to know the degree to which FSAs increase cost sharing when in fact cost-sharing increases have encouraged the spread of FSAs. Similarly, there may be simultaneity bias

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They conclude that FSAs are effectively a "subsidy to health care for high-income workers that is partly offset by efficiency gains at the expense of low-income workers" (Jack *et al.* 2006, p.2299).

in our analysis of enrollment decisions. For example, employees who participate in FSAs may opt for high deductible insurance, or employees with high-deductible insurance may opt to participate in FSAs.

To account for the endogeneity of FSAs, we follow Heckman and Robb (1985) and estimate versions of

$$\kappa_i = X_i\beta + \gamma F_i + \varepsilon_i \qquad (1)$$

where κ is a measure of cost sharing (the actuarial value of a plan, physician coinsurance rates and/or copayments, and overall deductible levels) of insurance plan i, F_i is an indicator for whether or not the employer offering plan i also offers access to an FSA, and X_i is a vector of other plan and employer characteristics. Because F is endogenous, we do not estimate equation (1) directly. Instead, we first predict F using a probit, as a function of variables Z not included in X, and then use the predicted probabilities as instruments for F in (1).

For instruments, Z, we consider three different employer characteristics, all in the spirit of Jack, *et al.* (2006). The first is the firm's age. Our theory is that older firms are more likely to have FSAs, ceteris paribus, probably because these complex employee benefits are not a top priority for the human resources departments at new businesses. Moreover, a firm's age seems unlikely to be related to cost sharing, after controlling for other observable employer characteristics. As we will show, this theory is not entirely borne out by the data.

As a second instrument in Z, we use a dummy for whether or not the firm has multiple establishments, to capture economies of scale in administering FSAs. We did not want to use establishment size or firm size directly, because that would be more likely

correlated with economies of scale in provision of health insurance. The idea here is that additional employer locations yield economies of scale in FSA administration but should not affect health care cost sharing requirements of plans. Finally, as a third instrument we use the fraction of the establishment's workforce that is eligible for health insurance, to capture the benefits to the employer and its employees of establishing an FSA. We also try using subsets of these three instruments, where for each subset we include the omitted instrument as a covariate in (1).

4. Data and descriptive statistics

To test whether subsidizing out-of-pocket healthcare costs encourages increased cost-sharing, we turn to the MEPS–Insurance Component (MEPS-IC), a large, annual, nationally representative survey of establishments in the U.S.[7] The MEPS-IC contains information on whether an establishment offers health insurance, the number and type of plans it offers, and the characteristics of those plans including total premiums for single and family coverage, employee and employer contributions toward premiums and the specific benefit provisions under the plan. These detailed data are collected for as many as four offered plans per establishment.

Figures 1 and 2 and Table 1 describe the prevalence of FSAs and means of the various cost-sharing measures. To construct the sample for these tables, we include all establishments that offer insurance and all comprehensive health insurance plans from the 2001-2005 survey years, including cases where the cost-sharing measures or the presence of a flexible spending account has been imputed, to ensure that the descriptive statistics

[7] The MEPS-IC is sponsored by the Agency for Health Care Research and Quality (AHRQ) and conducted by the U.S. Bureau of the Census. Even though the MEPS-IC is called a "panel", the data are really a series of independent cross-sections of establishments.

are nationally representative. We use establishment-level weights to calculate the percent of establishments offering an FSA to employees, and then eligible employee-level weights to determine the percent of eligible employees offered an FSA. We use the plan-level sample to calculate mean copayments and coinsurance rates for physician office visits and mean levels of individual deductibles for enrolled employees. These cost-sharing estimates are calculated for plans in all establishments and for those that do and do not offer an FSA. In addition, all cost variables are inflation-adjusted (using the CPI, all items) to constant 2005 dollars.

From 2001 to 2005, the percentage of establishments offering an FSA rose from 14 percent to 20 percent. However, because FSAs are disproportionately available to employees of larger businesses, the proportion of employees with access to an FSA is substantially larger, rising from 50 to 61 percent. Figure 1 presents estimates of the percentage of establishments offering an FSA by firm size. These estimates show that the growth and prevalence of FSAs has been mostly a large-firm phenomenon. In 2005, only 4 percent of establishments in the smallest firms (with fewer than 10 employees) offered an FSA, compared with 81 percent of establishments in the largest firms (those with 1000 or more workers). Two surprising facts emerge from Figures 1 and 2. First, almost 30 years after the legislation enabling the creation of FSAs, use of the accounts is still growing. Second, by 2005, the accounts are still not universal even among the largest employers.

Is a relationship between FSA availability and cost sharing apparent in simple descriptive comparisons? Table 1 reports estimates of physician coinsurance and copayment rates and deductible levels for active employees who are enrolled in those

plans, at employers with and without FSAs. From 2001 to 2005, only about 18 percent of enrollees had plans with physician cost sharing in the form of coinsurance rates[8]. For those enrollees, average coinsurance rates declined from 18.94 to 18.16 percent. In comparison, about three quarters of enrollees had copayments for physician visits, and the levels of those copayments increased from $15 to $19 (2005 dollars). At the same time, rising numbers of enrollees faced positive deductibles (44 to 62 percent), and the average size of those deductibles increased from $431 to $614.

Our main interest, however, is whether these trends differ for plans with and without FSAs. As seen in Figure 3, coinsurance rates declined for enrollees with access to an FSA but remained stable for those without such access. Coinsurance rates fell from 18.97 to 17.62 percent for enrollees at establishments with FSAs, and remained close to 19 percent for enrollees without FSAs. Note that this is exactly opposite to what our theory would predict -- that FSAs increase coinsurance rates.

A similar trend is evident for copayments and deductibles. Copayments (Figure 4) increased from $14.97 to $18.10 (up 21 percent) for enrollees with FSAs, and from $15.66 to $19.71 (up 26 percent) for enrollees without FSAs. Deductibles (Figure 5) rose from $376 to $528 (an increase of 41 percent) for enrollees at establishments with FSAs, while deductibles rose from $486 to $764 (57 percent) for enrollees without FSAs. Again, we would have expected the biggest increase in cost sharing to have occurred where cost-sharing was subsidized.

Of course, these descriptive comparisons may reflect confounding factors and therefore do not rule out the possibility that the rise in the prevalence of FSAs has been

[8] The estimates for physician coinsurance rates and copayment rates in Table 1 exclude plans that have both a coinsurance rate and a copayment rate for physician visits.

associated with increased cost sharing over time. In order to move beyond the descriptive statistics and try to address the causal effect of FSAs on cost sharing, we turn to a multivariate analysis based on equation (1).

5. Results

To estimate the effect of FSAs on cost sharing, we construct a second set of samples from the MEPS-IC data that exclude observations with imputed values for flexible spending accounts and cost-sharing measures. These samples also restrict attention to 2005, because a change in survey procedures yielded a much higher response rate for the coinsurance and copayment variables in that year.[9]

We estimate versions of equation (1) where the cost-sharing measure (κ) is an estimate of the percentage of total healthcare costs paid by the insurance plan. This actuarial value (Gabel, et al., 2006), combines information on physician and hospital coinsurance/copayment rates, deductibles, out-of-pocket maximum levels and covered services into one estimate that represents the percentage of a given population's medical expenditures that would be paid for by the insurance plan. These actuarial values are calculated for the overall population with employment related insurance and for the population at different levels of the distribution of medical expenditures (i.e. high users and low users). Since the values were calculated using the 2002 MEPS-IC, to apply them to our 2005 data we regressed the 2002 values on cost-sharing measures available in both the 2002 and 2005 datasets, and used the coefficients from the 2002 model to predict actuarial values for 2005. While we are not able to present estimates on actuarial values

[9] In 2005, the questions on physician copayment and coinsurance rates were added to a telephone follow-up questionnaire asked of respondents who did not respond to the mail questionnaire.

in this version of the paper[10], Gabel et al. (2006) provide a detailed description of the 2002 actuarial values used in our analysis. To give some idea of the range of values, they note that the average actuarial value was 83.2% in 2002 and that it was 86% for the highest 10% of health care users and 72% for the lowest 50% of users.

In some respects, estimating models of actuarial values is advantageous in that the entire spectrum of cost sharing can be accounted for in one equation. However, if the effects of FSAs operate in different directions on different cost-sharing requirements, these effects can be obscured in such an analysis. Therefore, in addition to the regressions using the actuarial values, we estimate separate versions of the models for plans that have physician cost sharing in the form of coinsurance rates, copayments, and deductibles. The copayment sample (18,297 plans) includes those plans that have either no cost-sharing for physician visits or their cost sharing is expressed as a copayment for each visit. The coinsurance sample (6,129 plans) is similar except that in addition to including those cases with no physician visit cost-sharing it includes those with a positive coinsurance rate. Both of these samples exclude the small percentage of plans where there is both a coinsurance and a copayment for a physician visit. However, they also overlap in that both include plans with zero values for cost-sharing for physician visits since zeroes could either be considered as copayment or coinsurance rates. The deductible sample (24,099 plans) includes those cases with either a zero or positive deductible.[11]

[10] Due to the difficulties of disclosing results from the Census data center, we discuss the results from the actuarial models but do not provide estimates. We plan to include estimates from these models in a final version of the paper.

[11] These sample sizes are relevant for the eligible employee weighted models. For the enrollee weighted models, sample sizes are lower since some plans had zero enrollment. The sample sizes for these models are 18,297 for the copayment models, 5,618 for the coinsurance models and 22,171 for the deductible models.

Note that one disadvantage in estimating the physician copayment and coinsurance rates separately is that it may introduce some selection bias into the estimates if FSAs are associated with different plan types. We had considered combining the two physician cost-sharing measures into one variable, for example, by dividing the copayment rate by the average cost of a physician visit. However, the resulting percentage is highly dependent on the estimate for the cost of the physician visit, which can vary widely depending on the type of physician and also whether we utilize the mean or median values. Another concern is that, as noted in Gabel et al. (2006), plans that are structured with physician copayments typically do not have deductibles that apply to physician visits. Therefore, our physician cost sharing equations embody some information on deductibles as well. To try to address this issue, we also perform sensitivity tests where we estimate our equations for plans with only positive values of coinsurance and copayment rates, respectively.

We weight each model using two different survey weights. Both weights start with the base plan level weight provided in the MEPS-IC that is used to produce national estimates of the number of plans and plan characteristics. We then modify this to create the first weight, which is equal to the plan-level weight multiplied by the number of eligible employees in the establishment. Results from these models would reflect plans that were offered to eligible employees. The second weight is equal to the plan weight multiplied by the number of active employees who are enrolled in the plan. Results from this set of models tilt the menu of plans toward those that were selected by enrollees. It is possible that the results from this model might be smaller in magnitude than the eligibility weighted results. This might occur, for example, if employers believe that

access to an FSA is all that is important when considering which plans to offer employees, but enrollees take into account whether or not they will participate in the FSA. For example, Cardon and Showalter (2001) find that FSA participation rate at the employer they analyzed was quite low. If enrollees don't expect to enroll in an available FSA, then their choice of plans would be unlikely to reflect the availability of the FSA. In addition, if employees have not been able to accurately predict medical expenditures in the past and put too little money in FSAs, they would have had a share of their out-of-pocket costs that were not tax-subsidized. They might take this experience into account when selecting their level of cost-sharing.

Note that we while employ the use of survey weights to help describe the population in our analyses, we've also excluded plans with imputed data. Therefore, we cannot claim that our results are nationally representative. In a final version of the paper, we plan to estimate our models on the full sample of plans and compare our original results to these estimates.

To control for worker characteristics within the establishment we include measures of the percent of employees who are female, the percent over age 50, the percent unionized, and the percent of workers in three wage categories. Establishment characteristics include establishment size and firm size (as categorical variables), the establishment's industry and a categorical set of measures for the firm's age, whether it is part of a multi-unit firm, and its organization form. In addition, we include the top income tax rate for the state in which the establishment is located, and categorical variables for the nine Census divisions.

Table 2 presents probit estimates of the likelihood of having an FSA on establishment and region characteristics. These estimates are used to generate predicted probabilities of having an FSA that will in turn be used as instruments in (1). The estimates in columns (1) through (3) are constructed using samples of plans that have coinsurance rates, copayments, and deductibles, respectively.

The first set of regressors are intended as instruments – predictors of FSA availability that are uncorrelated with the error term in (1). The age dummies, for the most part, are not statistically significant, even collectively. Employers in multi-establishment firms are more likely to offer FSAs, even controlling for firm and establishment size. And establishments with a higher percentage of employees eligible for health insurance are more likely to offer FSAs, at least for the establishments with health plans with copayments and deductibles.

Among the other establishment characteristics, employers with more highly paid employees, and more female employees, are more likely to offer FSAs. And establishments belonging to larger firms and, to a lesser extent, larger establishments, are more likely to offer FSAs. The state's top marginal income tax rate is not statistically significant, perhaps because differences in this variable are mostly absorbed by the Census division fixed effects, or perhaps because the relevant tax variation is across wage categories, rather than states, and is explained by the categorical wage variables.

Table 3 presents our basic estimates of equation (1) for each measure of cost-sharing. In each case, we report both an OLS version as a benchmark, and a 2SLS version using the predicted values of F. Each pair (OLS and 2SLS) are run separately for establishments with health plans with coinsurance rates, deductibles, and copayments.

Our results in column 1 indicate that in the OLS regression of coinsurance rates, the coefficient on the FSA dummy is small in magnitude and statistically insignificant. Once we instrument for the FSA dummy, however, we find a large and statistically significant coefficient (column 2) which suggests that the presence of an FSA increases coinsurance rates by 9 percent – a large jump given that the average coinsurance rate for enrollees is 18.68 percent (Table 1). We do not find any statistically significant FSA coefficients in the copayment, deductible or various actuarial value models.

The results discussed above represent the effect of FSAs using the eligible employee weights. Table 4 contains the results for the enrollment weighted models. As seen in the second row of Table 4, we still find a positive coefficient on the FSA variable in the coinsurance rate equation, and again find statistically insignificant coefficients on the copayment and deductible equations. While the FSA coefficient is smaller in magnitude in the enrollee than the eligible employee equation, the two coefficients are not statistically different. In addition to the results shown in Table 4, the coefficients in the actuarial value models, for the overall population and for high and low medical care users, are also statistically insignificant (data not shown).

Our results from both the eligible employee and enrollee weighted models are similar to those in Jack *et al*. who found a coefficient of 1.4 in their OLS regression for coinsurance rates and a coefficient of 6.8 in the instrumental variables regression. While, these results replicate Jack *et al.*, they are less convincing in this current context due to problems with our instrumental variables. For example, in the first stage probits in both the eligible and enrollee-weighted coinsurance models, the coefficients on the age dummies are not jointly significant nor is the coefficient on the percent of workers

eligible for insurance. Of the three instruments we included in the model, only the coefficient on multi-unit employers is statistically significant. Unfortunately, the coefficient on this variable is also significant in the second stage equations (Table 4) in both the enrollee and eligibility-weighted models. Our results are also somewhat sensitive to the different specification tests shown in Table 4. For example, in the enrollee-weighted model where we drop the multi-unit variable from the first stage and include it in the second, the coefficient on FSA is statistically insignificant.

As indicated in Tables 2 and 4, we encounter similar difficulties in our copayment and deductible models. In the versions of our copayment models using different weights, we find that the percent eligible and the multi-unit coefficients are both individually significant (Table 2, for eligibility weighted results) and jointly have an F-statistic greater than 10 (test not shown). In the eligible employee weighted first stage probit, only the coefficient on multi-unit establishments has an F statistic greater than 10. In the enrollment weighted probit, this is true for the multi-unit and eligible worker coefficients. However, the coefficient on the eligible worker coefficient is also significant in the second stage equation. In the deductible models, the percent eligible and multi-unit variables obtain similar results in the first stage probits. In the second stage, however, neither is statistically significant, which is encouraging. One concern, however, is that a priori we would not have expected the instruments to perform differently in the different models since all are estimating various forms of the same general concept - generosity of coverage.

In addition to exploring the sensitivity of our results to different instruments, another important area to examine is the interrelationship between

coinsurance/copayment rates and deductibles. As mentioned above, one complication with looking at physician copayment and coinsurance rates separately is that each equation embodies some information on deductible levels as well. Plans that are expressed as copayments for physician visits do not require satisfying a deductible for physician visits, whereas plans with coinsurance rates may or may not also have deductibles for physician visits. This aspect of plan design may, in fact, inform some of our unexpected results for copayments. While none of our models find a statistically significant coefficient on FSAs in the copayment equations at the 5% level, in one of the enrollee weighted models, the negative FSA coefficient is statistically significant at the 10% level. This unexpected result could be due to movement from the zero to the positive values in our data, which may also reflect eliminating deductibles for physician visits. To test this, we also estimated models subset to plans with positive copayments. All but one of these models yielded statistically insignificant effects of FSAs on copayment rates[12]. The one model with a significant coefficient also found a negative relationship between copayments and FSAs. Since the specification with the negative coefficient was the same for both the full sample for copayments and the restricted sample, this suggests that the negative results are driven by something other than the copayment/deductible relationship.

Similarly, it is possible that the positive coefficient in our coinsurance rate equation reflects the movement from zero to positive values and an implicit movement, due to plan design, to a positive deductible that applies to physician visits. In this model,

[12] These sensitivity tests were run with a maximum likelihood model for each pair of FSA and cost-sharing equations. These models yielded very similar qualitative findings to our IVREG models. The main differences were that some of our negative FSA coefficients in the copayment and deductible models that were statistically significant at the 10% level in the IVREG model were not significant in the maximum likelihood models.

unlike the copayment model, these two confounding factors move in the same direction. In models subset to positive values of the coinsurance rate we did not find an effect of FSAs on coinsurance rates.

We also estimated a model for a 0/1 indicator of the presence of a positive deductible and found some preliminary evidence that FSAs are associated with plans with deductibles. In the enrollment weighted equations, the effect of FSAs on positive deductibles was relatively consistent across specifications with different instruments. The results were less consistent in the eligibility weighted models. We also found mixed evidence in models where the dependent variable represented continuous deductible levels, subset to plans with positive deductibles. In the enrollee weighted models, we did not find much of a relationship between FSAs and deductible levels. In the eligibility weighted equations, we found some negative coefficients on our FSA variable, but again the statistical significance of these coefficients varied across specifications.

An additional concern with our model is the presence of HSAs or HRAs in our data. Since HSAs must be paired with high deductible plans, including them in our models for deductibles could be problematic. In 2005 HSAs were available, however, they were not yet an important factor in employment-related insurance. Therefore, only a small percentage of our sample includes plans identified by MEPS-IC respondents as high deductible plans paired with an HSA. An additional small percentage of plans are associated with HRAs. We test the sensitivity of our results to plans with HSAs and HRAs by excluding plans that have HSAs from the analysis and also excluding plans that

have both HSAs and HRAs. The results from excluding HSAs are similar to the eligible employee and the enrollee weighted IV results.[13]

6. Conclusions

Tax subsidies for out-of-pocket healthcare expenses (those not covered by health insurance), have existed in various forms in the U.S. for almost three decades. Given a subsidy for out-of-pocket costs, insurance purchasers may opt for less expensive insurance, with lower premiums and higher deductibles, knowing that uncovered expenses are subsidized. With HSAs, in fact, this higher level of cost sharing is mandated in the form of high deductible health plans. If market forces lead to higher cost sharing, this mandated level of deductibles may not be binding. However, if people would not opt for higher cost sharing in the face of such a tax subsidy, or would not opt for as much cost sharing as is necessary to open an HSA, then the requirement may deter HSA participation.

In this paper we analyze data from a recent, nationally representative survey of employers, the MEPS-IC, to examine whether employees with access to FSAs choose health insurance with greater cost sharing, or are offered such insurance by their employers. Although FSAs differ from HSAs in several respects, they both subsidize uninsured healthcare costs by an amount equal to the patient's marginal income tax rate. By examining the impact of FSAs on cost sharing, we hope to shed some light on the implications of HSAs on employer and employee decisions.

[13] In the model where we exclude both HSAs and HRAs, we find that the negative coefficient on the FSA dummy in the deductible model is now statistically significant at the 5% level in both the eligible and the enrollee weighted models. In addition, the positive coefficient on the FSA dummy in the coinsurance model is statistically significant at the 10%, rather than the 5% level in the enrollment weighted model.

We examine a number of dimensions of cost-sharing, including physician copayment and coinsurance rates, overall deductible levels and actuarial values, which represent summary measures of the generosity of a health plan. By utilizing eligible and enrollee weighted models, we examine both employers' decisions on the types of plans to offer, and enrollees' decisions on the types of plans to select. We find mixed evidence that FSAs change the cost-sharing of insurance plans. In descriptive statistics, coinsurance rates for employer sponsored health insurance have been falling for plans whose enrollees have access to FSAs but not for those without access, and copayments and deductibles have been rising more slowly. When we control for other plan and establishment characteristics in our multivariate models, and attempt to control for the endogenous decision by firms to offer FSAs, we do find some evidence that coinsurance rates are higher than they otherwise would be in establishments with FSAs. However, we do not find this effect when we restrict our models to plans with positive coinsurance rates. We also find no similar evidence for copayments or the actuarial value of the health plan. Our results for deductibles are also mixed. We find no effect on continuous levels of deductibles, but we find some evidence of a positive effect of FSAs on the presence of a deductible. The mixed nature of our findings and the sensitivity of our results to different specifications make it difficult to draw implications for the market for HSAs.

Finally, our analysis so far has focused on the financial measures of plans, such as the actuarial value of the plan, the physician coinsurance or copayment rate and deductibles. These measures all ignore the non-monetary value to consumers of other aspects of plans, such as having restrictions on the types of providers available and other

types of non-price controls. One area for future research is to examine the relationship between FSAs and employers' and employees' decisions with respect to HMOs, PPOs, and other plan types.

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Table 1: Cost Sharing Requirements for Enrollees

	Number of Active Employee Enrollees	Physician Visit Cost Sharing				Overall Plan Level Deductible	
Year	(000s)	Proportion with a positive coinsurance rate	Coinsurance Rate	Proportion with a positive copayment rate	Copayment rate (2005 $)	% with a positive individual deductible	Individual Deductible (2005 $)
				All Enrollees			
2001	63,020	0.18	18.94	0.76	15.30	0.44	431
2002	61,173	0.16	17.90	0.76	16.65	0.46	453
2003	60,348	0.18	18.05	0.74	17.43	0.50	511
2004	60,632	0.18	18.69	0.73	18.53	0.57	542
2005	60,648	0.18	18.16	0.74	18.68	0.62	614
				Enrollees with FSA Access			
2001	32,699	0.19	18.97	0.77	14.97	0.42	376
2002	32,717	0.17	17.52	0.76	16.25	0.44	375
2003	35,967	0.20	17.84	0.73	16.76	0.47	448
2004	38,719	0.18	18.36	0.74	18.07	0.55	453
2005	38,598	0.20	17.61	0.74	18.10	0.62	528
				Enrollees without FSA Access			
2001	30,321	0.17	18.90	0.75	15.66	0.46	486
2002	28,456	0.15	18.42	0.76	17.10	0.48	537
2003	24,381	0.16	18.43	0.75	18.40	0.56	588
2004	21,913	0.17	19.30	0.73	19.35	0.60	684
2005	22,050	0.16	19.37	0.74	19.71	0.62	764

Source: 2001-2005 Medical Expenditure Panel Survey – Insurance Component, private sector establishments.
Note that the coinsurance sample excludes cases that also have positive copayment rates. Similarly, the copayment sample excludes plans with positive coinsurance rates. The coinsurance rates and copayment rates are calculated on these samples.

Table 2: First-stage probit of whether or not an employer offers an FSA

	Coinsurance rates sample (1)	Copayment sample (2)	Deductible sample (3)
Instruments			
Firm age 3-4	0.29	-0.89*	-0.69
	(0.61)	(0.41)	(0.37)
Firm age 5-9	0.38	-0.32	-0.31
	(0.51)	(0.35)	(0.32)
Firm age 10-20	0.15	-0.46	-0.47
	(0.50)	(0.34)	(0.31)
Firm age >20	0.42	-0.36	-0.36
	(0.50)	(0.34)	(0.31)
Multiplant firm	0.57*	0.29*	0.32*
	(0.12)	(0.09)	(0.07)
Percent employees eligible	0.21	0.38*	0.32*
	(0.21)	(0.14)	(0.12)
Exogenous regressors			
Percent workers earning < $10/hr	-1.63*	-1.67*	-1.70*
	(0.30)	(0.16)	(0.16)
Percent workers earning $10 to $23/hr	-0.91*	-0.91*	-0.91*
	(0.24)	(0.12)	(0.12)
Percent workers unionized	-0.14	-0.18	-0.12
	(0.17)	(0.12)	(0.11)
Percent workers female	0.40*	0.31*	0.14
	(0.20)	(0.13)	(0.11)
Percent workers > 50 yrs old	0.41	0.25	0.16
	(0.28)	(0.17)	(0.15)
Top state marginal income tax rate	0.0129	0.0054	0.0089
	(0.0140)	(0.0097)	(0.0088)
Firm size: 10-24 employees	-0.07	0.10	0.15
	(0.22)	(0.13)	(0.11)
Firm size: 25-99 employees	0.54*	0.78*	0.76*
	(0.20)	(0.13)	(0.11)
Firm size: 100-999 employees	1.10*	1.30*	1.30*
	0.21	0.14	0.12
Firm size: 1000+ employees	1.41*	2.14*	1.98*
	(0.23)	(0.15)	(0.13)
Establishment size: 10-24 employees	0.35*	0.30*	0.28*
	(0.16)	(0.09)	(0.08)
Establishment size: 25-99 employees	0.29*	0.18*	0.21*
	(0.14)	(0.09)	(0.08)
Establishment size: 100-249 employees	0.30	0.05	0.07
	(0.16)	(0.10)	(0.09)
Establishment size: 250+ employees	0.29*	0.40*	0.35*
	(0.16)	(0.10)	(0.10)
Ownership type dummies	Yes	Yes	Yes
Census division dummies (8)	Yes	Yes	Yes
Industry dummies (11)	Yes	Yes	Yes
Demographic data availablility dummies	Yes	Yes	Yes
Number of observations	6,129	18,297	24,099
Joint test of instruments F(7)	4.24*	4.43*	5.37*

Source: 2005 Medical Expenditure Panel Survey – Insurance Component, private sector establishments. * indicates statistical significance at the 5% level. Independent variables also include a measure for Firm age: Missing.

Table 3: Cost-Sharing Equations: Eligibility Weighted

	Coinsurance rate		Copayment		Deductible	
	OLS	**IV**	**OLS**	**IV**	**OLS**	**IV**
	(1)	(2)	(3)	(4)	(5)	(6)
FSA	0.49	9.18*	0.48	-2.07	11.6	-179.5
	(0.56)	(2.47)	(0.31)	(1.83)	(18.8)	(97.2)
Percent workers earning < $10/hr	1.87	6.10*	2.89*	1.74	112.9*	21.6
	(1.46)	(1.98)	(0.75)	(1.03)	(45.3)	(56.2)
Percent workers earning $10 to $23/hr	-0.17	1.91	1.35*	0.81	92.0*	49.5
	(1.24)	(1.46)	(0.57)	(0.71)	(33.6)	(38.7)
Percent workers unionized	-1.86*	-1.55	-3.51*	-3.59*	-23.0	-27.7
	(0.93)	(0.98)	(0.49)	(0.50)	(32.8)	(33.5)
Percent workers female	0.46	1.34	-0.63	-0.38	11.8	22.8
	(1.15)	(1.20)	(0.56)	(0.54)	(32.4)	(33.5)
Percent workers > 50 yrs old	0.90	1.39	-1.27	-1.08	105.9*	116.7*
	(1.51)	(1.51)	(0.78)	(0.81)	(43.9)	(43.7)
Top state marginal income tax rate	0.16	0.13	0.03	0.03	-1.2	-0.7
	(0.10)	(0.10)	(0.05)	(0.05)	(2.3)	(2.3)
Firm size: 10-24 employees	1.30	1.68	1.01	1.01	-8.2	-5.7
	(1.35)	(1.48)	(0.57)	(0.57)	(33.0)	(33.2)
Firm size: 25-99 employees	-1.03	-2.57	0.37	0.86	-124.0*	-86.5*
	(1.16)	(1.33)	(0.54)	(0.67)	(32.2)	(38.4)
Firm size: 100-999 employees	1.11	-2.80	-0.21	0.88	-190.1	-106.7*
	(1.02)	(1.62)	(0.51)	(0.89)	(28.3)	(50.6)
Firm size: 1000+ employees	3.10*	-1.96	-0.51	1.21	-263.9*	-138.9*
	(1.05)	(1.84)	(0.55)	(1.37)	(29.9)	(66.4)
Establishment size: 10-24 employees	0.37	-0.56	-0.34	-0.17	-10.5	2.2
	(0.96)	(1.13)	(0.41)	(0.43)	(20.1)	(21.0)
Establishment size: 25-99 employees	0.56	0.02	-0.42	-0.36	44.9*	51.8*
	(0.79)	(0.90)	(0.40)	(0.41)	(20.3)	(20.7)
Establishment size: 100-249 employees	1.36	1.08	0.06	-0.02	17.8	13.6
	(0.81)	(0.96)	(0.43)	(0.45)	(22.2)	(22.7)
Establishment size: 250+ employees	-0.52	-0.70	-0.84	-0.71	-28.5	-20.2
	(0.77)	(0.92)	(0.39)	(0.40)	(20.2)	(21.4)
Ownership type dummies	Yes	Yes	Yes	Yes	Yes	Yes
Census division dummies (8)	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies (11)	Yes	Yes	Yes	Yes	Yes	Yes
Missing demographics dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of obsns.	6,129	6,129	18297	18297	24,099	24,099
R^2	0.09		.07		.08	

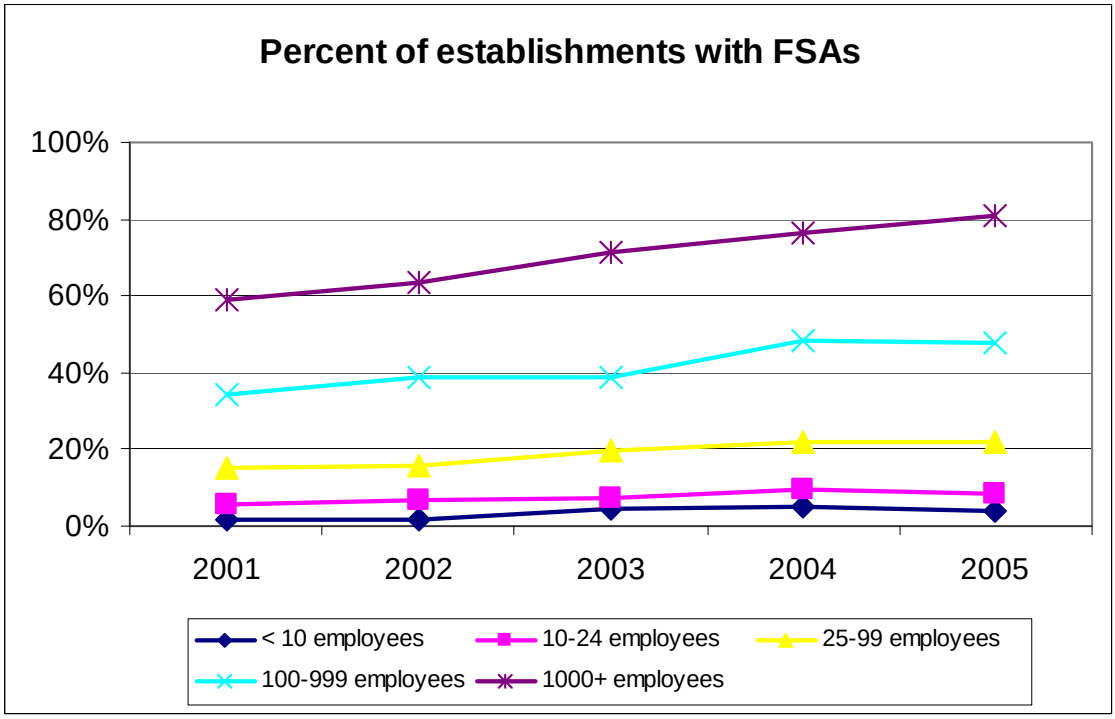
Source: 2005 Medical Expenditure Panel Survey – Insurance Component, private sector establishments. * indicates statistical significance at the 5% level.

Table 4: FSA Coefficient in models with alternative specifications

FSA Coefficient	Coinsurance rate (1)	Copayment (2)	Deductible (3)
Baseline, from Table 3	9.18*	-2.07	-179.5
	(2.47)	(1.83)	(97.2)
Enrollment weighted, IV - original specification	6.44*	-1.64	-114.3
	(2.43)	(1.92)	(88.4)
Eligiblity Weighted Models - IV			
Drop age of firm instrument	6.97*	-2.83	-159.1
	(2.55)	(1.58)	(99.9)
-- significant in 2nd stage	No	No	No
Drop multiplant firm instrument	5.93*	-2.96	-153.1
	(2.72)	(1.93)	(103.4)
-- significant in 2nd stage	yes	No	No
Drop percent eligible instrument	9.51*	-1.27	-180.0
	(2.47)	(1.91)	(104.3)
-- significant in 2nd stage	No	Yes	No
Enrollee Weighted Models – IV			
Drop age of firm instrument	5.06*	-2.996	-103.13
	(2.43)	(1.60)	(95.82)
-- significant in 2nd stage	No	No	No
Drop multi-unit firm instrument	2.062	-2.507	-80.66
	(2.56)	(2.02)	(99.24)
-- significant in 2nd stage	Yes	No	No
Drop percent eligible instrument	6.77*	-.36	-129.66
	(2.43)	(2.05)	(95.03)
-- significant in 2nd stage	No	Yes	No

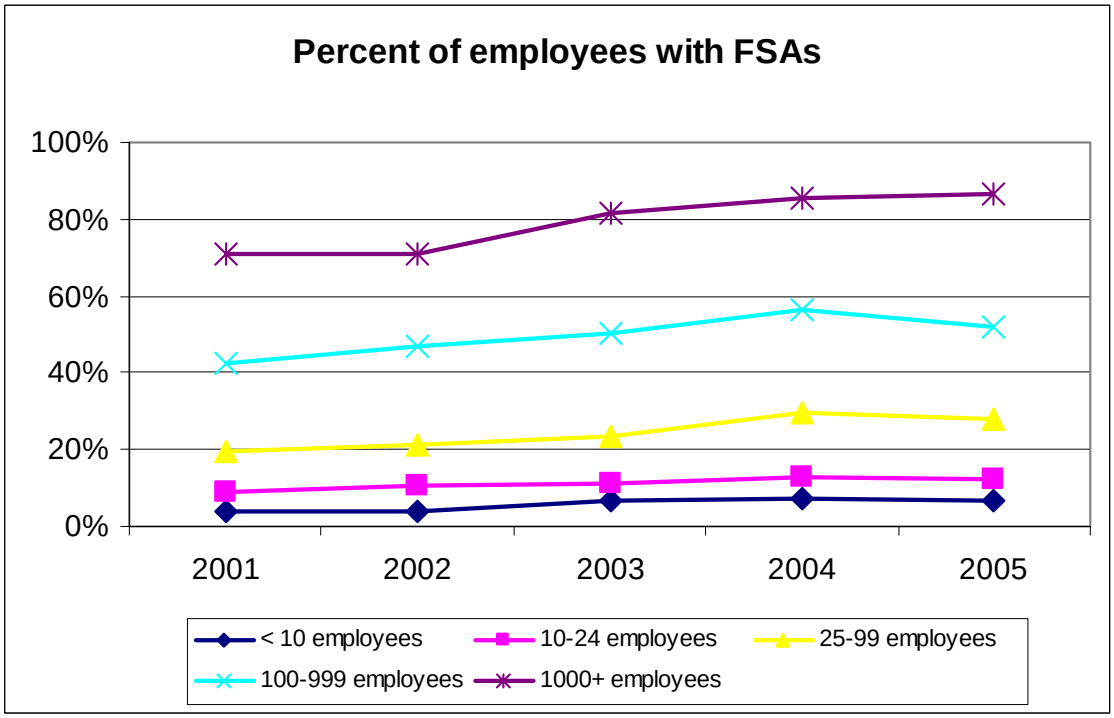
Source: 2005 Medical Expenditure Panel Survey – Insurance Component, private sector establishments. * indicates statistical significance at the 5% level.

Figure 1



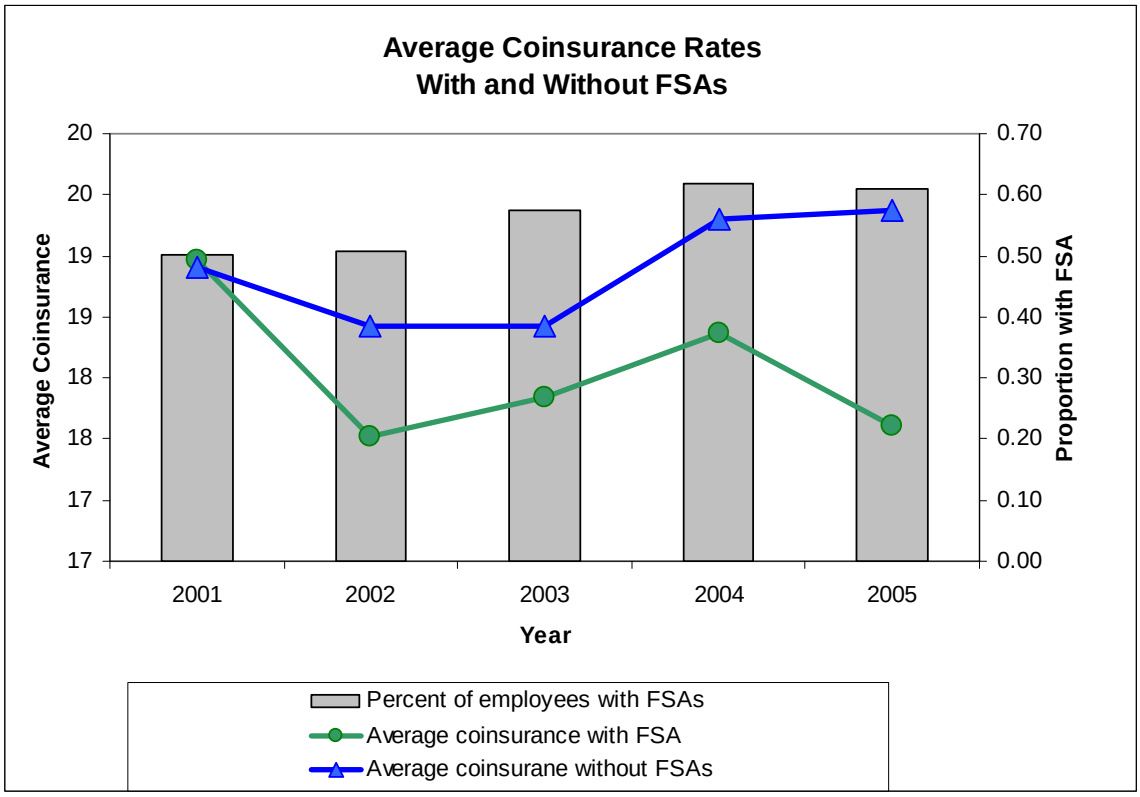
Source: 2001-2005 Medical Expenditure Panel Survey – Insurance Component, private sector establishments.

Figure 2



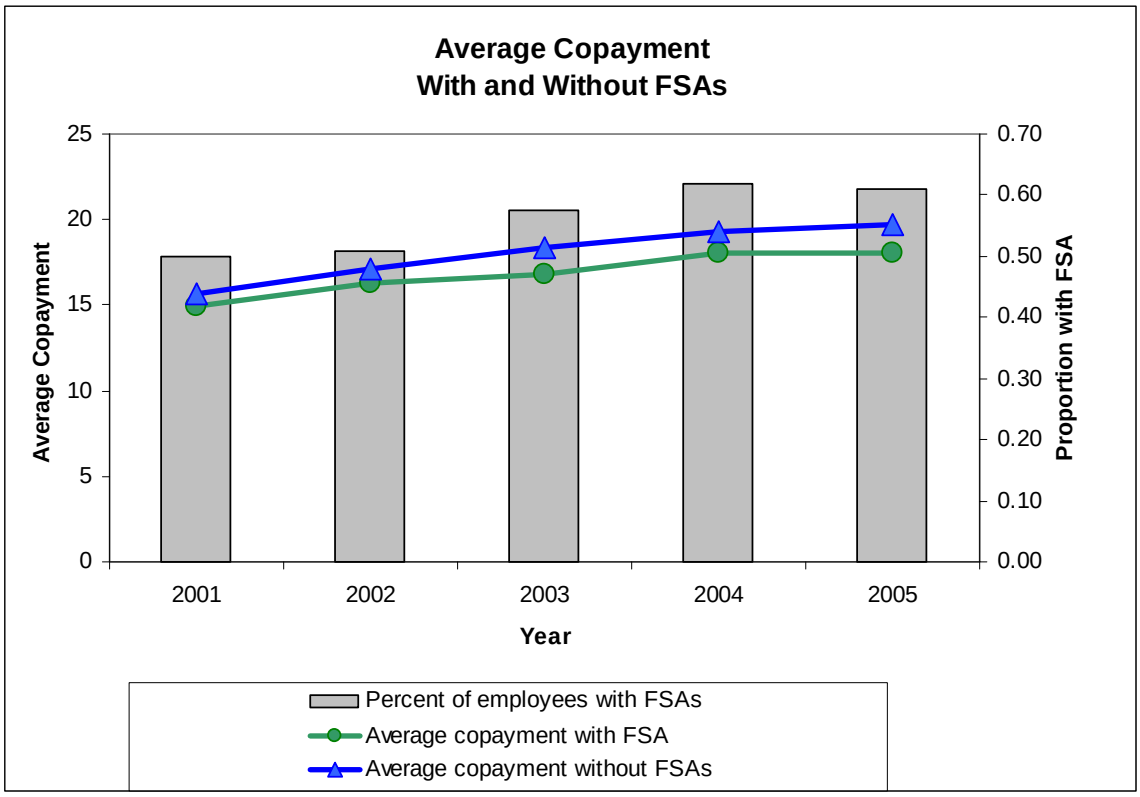
Source: 2001-2005 Medical Expenditure Panel Survey – Insurance Component, private sector establishments.

Figure 3



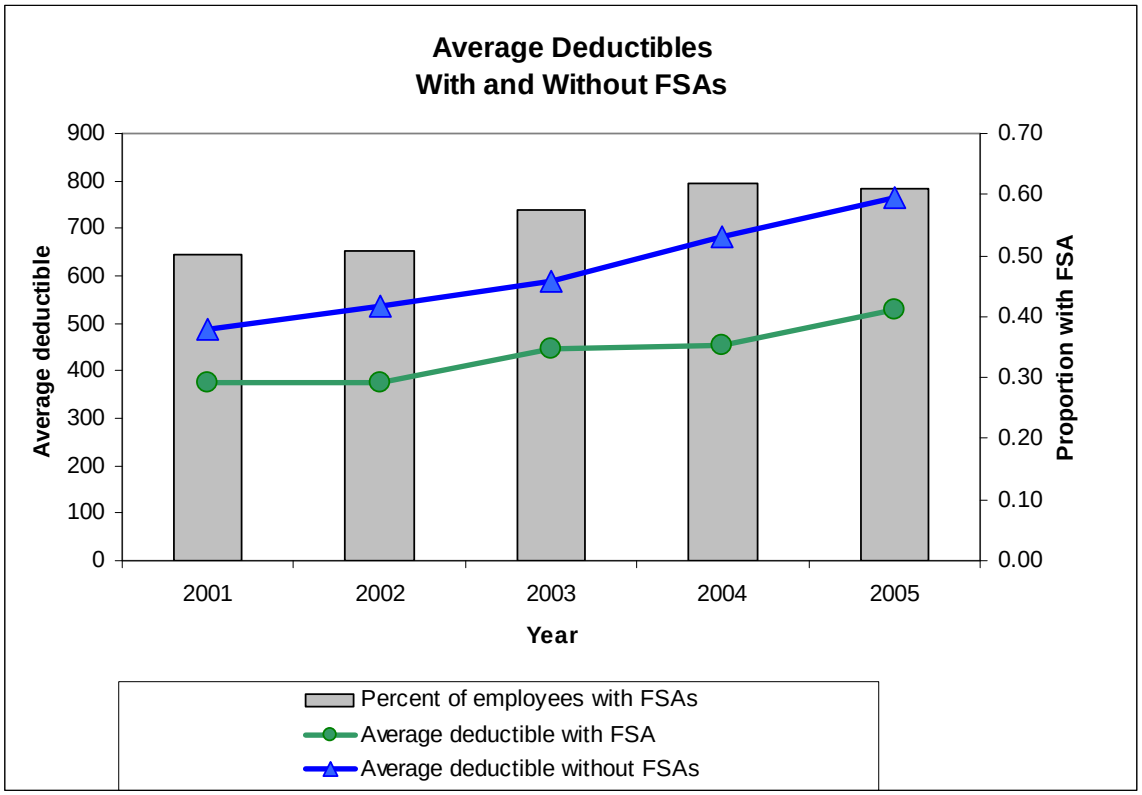
Source: 2001-2005 Medical Expenditure Panel Survey – Insurance Component, private sector establishments.

Figure 4



Source: 2001-2005 Medical Expenditure Panel Survey – Insurance Component, private sector establishments.

Figure 5



Source: 2001-2005 Medical Expenditure Panel Survey – Insurance Component, private sector establishments.