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WHERE THE MONEY GOES: MEDICAL EXPENDITURES IN A LARGE CORPORATION

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ABSTRACT

We use a new data file of insurance claims under employer-provided health plans to describe the pattern of expenditures in a large corporation: who spends? on what? for how long? The description is illustrative of detail that can be distilled for other firms. There are three noticeable features of spending: (1) The differences in the provisions of the two FIRM plans seem to have substantial effects on health care expenditures. Inpatient expenditures are a much larger fraction of the total under a first-dollar coverage plan available to hourly employees. (2) Substance abuse and other mental health disorders account for a surprisingly large fraction of health care costs. (3) The components of health care cost differ substantially across individuals, demographic groups, and plans, suggesting that further analysis of the "micro" details of medical expenditures may help to assess the probable implications of alternative insurance reforms. (4) There is substantial persistence in individual health care expenditures from year to year. Illustrative calculations suggest that this persistence may lead to considerable inequality in individual costs under demand-side insurance reforms such as those coupled with IHA saving plans, and thus may place important limitations on plans that might otherwise be attractive. The exploratory analysis contained in this paper suggests that firm data can provide important insights into the black box that erupts expenditures under private insurance plans. And, hence these data may provide greater understanding of how plan reforms may affect expenditures.

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Who spends the money? For what? For how long? We present detailed new evidence on these questions, based on longitudinal micro data on medical expenditures in a large Fortune 500 firm. The high and increasing health care costs of privately-insured Americans have been a central motivation behind proposals to reform the U.S. health care system. Yet our understanding of these costs is very limited. The questions we address have been difficult to answer based on previously available data. Public surveys with detailed information on expenditures are small and typically do not follow respondents for an extended time period. These features limit analyses of the role of specific medical conditions and individual heterogeneity in health care costs. The firm data that we use allows detailed analysis of these issues.

We consider first the spending of hourly versus salaried employees and the spending of men versus women. We then consider preliminary evidence on the medical conditions that account for spending in these groups. Finally, we consider the concentration of spending among a small proportion of employees and the persistence of spending by these employees over time. By describing in detail the way that money is spent and who spends it, our goal is to gain an understanding that will provide the foundation for more formal

analyses to follow. The descriptive analysis helps to direct attention to components of cost that would have to be affected if cost containment measures were to be effective. It also directs attention to the effects on individuals of particular insurance arrangements and suggests likely limits on the cost containment potential of specific plan provisions.

This is the first paper from a large study of employer health insurance plans. The principal goals of the research are to understand the relationship between health plan provisions and expenditures, and to determine the likely effects of plan reforms.

I. BACKGROUND

The data pertain to a large Fortune 500 manufacturing firm, referred to as the FIRM. The analysis is based on all fee-for-service medical insurance claims over the three-year period 1989 through 1991. Over this period there were approximately 300,000 employees and their dependents covered through these insurance plans. Employees and family members enrolled in preferred provider organizations (PPO) and HMOs are not included. The total number of active employees and active and retired employees enrolled in these plans and in traditional plans is shown in Table 1 for hourly and salaried employees. About 28% of all employees and 39% of active employees are enrolled in

PPOs and HMOs. The number of active employees by plan type over the period 1989 to 1992 is shown in Table 2. The proportion of employees in traditional plan decline from about 61% in 1989 to about 56% in 1992.

The firm has two fee-for-service plans, one for hourly and another for salaried employees. The hourly plan, with benefits negotiated in union contracts, provides "first-dollar" coverage for virtually all health care. Because of this virtually unlimited coverage, hourly employees have no financial incentives to join managed-care or HMO plans, though specific provider relationships and location considerations may provide some nonfinancial incentives. The salaried plan has an annual deductible of $200 per individual and $250 per family, a 20% coinsurance rate for all expenses, and an out-of-pocket annual limit (including the deductible) of $500 per family. Routine physicals are not covered. Both plans incorporate limited case management for certain high-cost medical conditions and concurrent review of hospital stays. The hourly plan includes pre-admission certification requirements for certain elective admissions; patients who elect admission despite pre-certification denial are responsible for 20% copayments up to $750 per individual and $1500 per family. Both plans also require second opinions for 16 elective surgical procedures, though the procedures are covered regardless of the second opinion finding. Both plans have very generous hospital stay limits:

365 days per stay, renewable after 60 days out of the hospital. Mental-health and substance-abuse inpatient care has a stricter day limit of 45 days, also renewable after 60 days out of the hospital. (During the time period of the study, a managed-care program was implemented for mental health and substance-abuse services and we describe this program in more detail below.) We speculate on the possible effects of some of these plan characteristics in the context of medical expenditure patterns. More formal analysis awaits further research.

II. WHO SPENDS THE MONEY?

We first consider aggregate expenditures in the firm and then compare these expenditure patterns with those of employees insured by a representative sample of all employer plans.

A. The Firm: By Employee Status.

Table 3 shows the cost of health care in 1990. The data distinguish hourly versus salaried employees, active versus retired employees, and employees versus all enrollees. Only about 49% of total cost is incurred by employees ($230.6 out of $471.6 million); the rest is attributable to other family members of employees. About 32% of total cost is attributable to retirees and their other family members ($149.3 versus $471.6 million). Among persons 55

to 64, however, the proportion accounted for by retirees is much higher. Over 71% of the cost of salaried employees and over 61% is the cost of hourly employees is attributable to retirees and their family members.

B. The Firm: By Employee Status and Gender.

Medical expenditures in 1990 by gender, age, and employee status are shown in Table 4 and in the corresponding plots in Figure 1. This and all subsequent tables and figures pertain to all enrollees under age 65; retiree and others over 65 are excluded. On balance women spend more than men, though the spending differentials vary substantially by age and between the hourly and salaried plans, as shown in Figure 1a and in the top panel of Table 4. The medical expenditures of women covered by the hourly plan are typically 5 to 7% higher than the expenditures of men. The difference is over 20 percent in the prime child-bearing years (ages 18-34). Under the salaried plan, the differentials are more pronounced: women 18 to 34 spend almost 80% more than men in this age group and women 35 to 44 spend 54% more than men. However, in the 55-64 age group women spend 16% less than men. Increasing expenditure with age is evident under both plans and for both men and women.

Differences in inpatient and outpatient expenditures of men and women under the hourly and the salaried plans are shown in Figures 1b and 1c (and in the last two panels of Table 4). The clearest difference is that inpatient care accounts for a much larger proportion of total expenditures under the hourly plan than under the salaried plan. Figure 1b shows that this is true for both men and women at all ages.

A more detailed view of the data, however, reveals that the difference between hourly and salaried plan expenditures varies by gender, as shown in Figure 1c. The heavier use of inpatient services occurs at all ages for both men and women, with the most prominent differences for men aged 18-44. In other respects the expenditures of men and women are rather different. Figure 1c shows that the higher inpatient expenditure for men aged 18-54 under the hourly plan accounts for the higher total costs under the hourly plan in this age group. Average outpatient expenditures of men in this age group do not differ much. For men in the youngest (0-17) and oldest (55-64) age groups, inpatient expenditure are only moderately higher under the hourly plan and higher outpatient expenditures under the salaried plan are more pronounced. Hence in these age groups, total expenditures are somewhat higher under the salaried plan.

In contrast, the higher average expenditures for women in the hourly plan are primarily the result of higher spending in the oldest (55-64) age group. Like the results for men, inpatient expenditures by women are much higher under the hourly than under the salaried plan in all age groups, but the differences increase rather than decrease with age. Outpatient expenditures are somewhat higher for women under the salaried plan at all ages.

In future work we will consider whether such differences in spending patterns across health plans reflect differences in plan incentives, or whether the differences between hourly and salaried employees reflect differences in health status or the propensity to use medical care. We cannot rule out these alternative possibilities using aggregate data from a single firm. Nor can we rule out the possibility that, given health status, the treatment recommended to salaried employees differs from the treatment recommended to hourly employees.) However, the spending patterns are consistent with substitution of inpatient for less intensive outpatient services by hourly employees with first-dollar coverage.

C. The FIRM Plan Compared to All Manufacturing Plans.

Both the hourly and salaried FIRM plans are among the more generous plans offered to U.S. manufacturing workers. Thus it might be expected that

expenditures under this plan would be greater than under the typical employer-provided plan. To explore this conjecture, we selected a comparison sample of employees in manufacturing firms from the National Medical Expenditure Survey (NMES). NMES collected cross-sectional data on medical expenditures in 1987 for a representative sample of approximately 37,000 individuals in 10,000 families. From the NMES sample, we selected the 6,345 employees (and their dependents) in manufacturing jobs, covered by employer-provided health insurance. We aggregated their inpatient and outpatient expenditures at the individual level and estimated 1990 expenditures by increasing the 1987 data based on the increase in the medical price index. (For comparability with the FIRM sample, pharmaceutical and dental expenditures, as well as a few others services, were excluded).

Expenditures in the representative sample of all manufacturing employees and in the FIRM are shown in Table 5. The Table shows average expenditures for the same age-sex-employee groups identified in Table 4, as well as the ratio of FIRM to average expenditures. The NMES sample sizes are also shown.

To interpret the cell comparisons, it is important to realize that the NMES samples sizes are much smaller than the FIRM samples. The FIRM cell means are based on 6,000 to 30,000 observations, while the NMES samples

range from fewer than 200 to about 700. Given the skewness and importance of outliers in medical expenditures, the NMES samples are far too small to allow precise comparisons: the standard errors of the NMES means are all over $1,000, so none of the differences between FIRM and NMES means are statistically significant. Thus it is not possible to confidently compare differences by cell. (The small NMES samples preclude meaningful "micro" analyses of expenditures for specific health problems, like those presented below for the firm.)

Though the differences are not statistically significant, except for young women, expenditures within each cell are substantially higher in the FIRM. The largest differences occur for 35-54 year-old men in the hourly plan. In turn, this difference results from much higher inpatient expenditures in the FIRM: the average for 35-44 year-olds is $783 in the FIRM compared to $134 in NMES, and for 45-54 year-olds the average is $1,023 in the FIRM and $210 in NMES. This large difference may be attributable to the effect of first-dollar coverage on the utilization of inpatient care. (The high ratio for 55-64 year-old salaried men is probably the result of the very small NMES sample size. Only 5 of the 144 individuals in this cell were hospitalized, an unusually low rate for this age group.)

The demographic composition of the FIRM employees—with more older employees and dependents—also contributes significantly to higher FIRM health costs relative to the national average. But adjusting for demographic differences between the FIRM and the NMES sample (using FIRM cell weights) still shows 40.8% higher costs in the firm, due primarily to differences for men. Controlling for age and gender differences, the expenditures under the hourly plan are 49.1% higher than the NMES average and expenditures under the salaried plan are 27.6% higher.

We conclude that, although qualitatively similar, FIRM expenditure is somewhat higher than the national average. The largest differences are for male hourly employees and these differences appear to be attributable to the greater use of inpatient services in the firm. In turn, it seems likely that the greater use of inpatient services is the result of the generous coverage under the FIRM plan. We do not pursue that issue here, however. In the remainder of this paper, we use the large firm sample to describe FIRM expenditure in more detail. Though the exact relationships observed in this firm are unlikely to prevail in other firms, we believe that the detailed analyses possible using large longitudinal FIRM samples can provide an understanding of medical costs that is not possible using smaller but nationally representative cross-section data.

III. WHAT DO THEY SPEND THE MONEY FOR?

A. By Diagnosis.

The approximate shares of expenditures associated with common specific health problems are shown in Table 6. The approximate expenditures are derived by grouping individual medical claims into specific diagnosis categories according to the ICD9 diagnosis code associated with the claim, using a categorization program developed by McClellan (1995) as an expansion of the ICD9 diagnosis categorization system used by the Agency for Health Care Policy Research (1993). The grouping system recognizes that reported diagnoses may be inexact. Thus, similar health problems are grouped together. Even with careful aggregation, however, diagnosis codes often cannot be interpreted literally. For example, physicians may report a more serious condition (e.g., breast cancer) to justify a screening procedure (e.g., mammogram) in a patient who is actually healthy, or may report a related condition or nonspecific code (e.g., acute myocardial infarction reported on a claim for a patient with chest pain when in fact the physician is concerned about excluding the possibility of acute myocardial infarction). Thus, the disease-specific cost estimates reported here include some cost for preventive or diagnostic treatments associated with the reported diseases rather than the diseases themselves. In addition, some claims will of course be misclassified

due to simple coding errors, although the grouping of diagnoses tends to minimize the effect of this problem. We return to these issues below, after presenting approximate results on disease-specific costs in 1990.

The percent of total claims that are paid for the treatment of specific diagnoses is shown in Table 6. The table distinguishes hourly and salaried employees and their dependents, men and women, and age groups—the same groups identified in Table 4. The 26 diagnoses considered in the table are among the most costly of 135 diagnosis groups. Together they account for about 50 percent of total expenditures in each group. For ease of comparison, four more aggregated diagnosis groups (e.g., "all cancers," which includes the specific cancer diagnoses listed in the table as well as other cancers, and "heart disease," which includes AMI, ischemic heart disease, chest pain, and other health problems relating to the heart) are shown at the bottom of the table.

No individual health problem accounts for an overwhelming share of total cost, though specific health problems account for a large fraction of the cost within specific groups. Over all employee groups, the "top six" diagnoses in order of total expenditures in 1990 were: substance abuse, ischemic heart disease, acute psychotic disorders (e.g., delirium induced by alcohol, drugs, or psychological disturbances), pregnancy and childbirth, back and spine

disorders, and neurotic disorders. Including substance abuse, three of the top six diagnoses are mental health problems. In particular, these diagnoses account for a large fraction of the claims of young men covered by the hourly plan, whose costs are substantially higher than similar employees in the NMES sample. Substance abuse claims, which account for a larger fraction of health care cost than any other single diagnosis, are concentrated these employees. Substance abuse claims account for 20% of the expenditures of hourly male workers aged 18 to 34 and 18% of expenditures for those aged 35 to 44. Substance abuse together with all other mental health disorders (including, e.g., anxiety disorders and acute psychotic disorders) account for about 30% of the health care costs of men aged 18-44. These diagnoses also account for a notable fraction of the expenditures of other groups as well. For example, all mental health disorders account for 28% of expenditures of persons under 18 covered by the salaried plan and 21% percent of the costs of men 18-34 covered under the salaried plan. But for these groups substance abuse is less important and other mental health disorders more important. Mental disorders account for at least 10% of costs in all groups under 45 years of age.

The fraction of costs accounted for by other diagnoses are possibly less surprising. For example, ischemic heart disease—the second most costly single disease—is an important fraction of the cost of men covered by both the

hourly and salaried plans beginning with the 35 to 44 age group. All forms of heart disease together account for a major fraction of expenditures in males beginning with the 35-44 age group, increasing to approximately one-third of expenditures for hourly and salaried males aged 55-64. All cancers combined (shown at the bottom of the page) account for a large fraction of the claims of women beginning as young as 18 to 34. For younger women, these costs are mainly associated with preventive treatments, such as gynecologic exams and mammograms. For women 45 and over, cancer-related costs account for 20% of expenditures in the salaried groups and 15% of expenditures in the hourly groups.

Pregnancy and childbirth together comprise the fourth most expensive health problem for individuals in the FIRM. For women 18 to 34 pregnancy and childbirth account for a quarter or more of all health care costs; neonatal expenditures also comprise a notable share of costs in the youngest individuals.

A major goal of our future work will be to understand the effect of health insurance provisions on expenditures for different types of diagnoses. For example, the large expenditures on inpatient services for substance abuse (e.g., detoxification programs) and on other inpatient and outpatient mental health treatments in the hourly plan in 1990 appear to be a consequence of the

first-dollar coverage of treatment under that plan. Union contracts prevented the FIRM from increasing demand-side incentives such as copayments or deductibles to limit use of these services. Instead, the FIRM contracted with a managed-care and utilization review service beginning in mid-1991 to monitor and guide use of detoxification treatments, especially inpatient admissions. As a result, the FIRM's health care costs attributable to substance abuse treatment fell dramatically in subsequent years. For example, by 1992 all mental health disorders accounted for 29% of the expenditures of men 18 to 34 covered by the hourly plan, compared to 42% in 1990.

Evidence from several sources suggests persons with mental health problems have a high elasticity of demand for any services and for treatment intensity conditional on seeking care. Because demand-side incentives are generally viewed as inadequate to limit use of mental health services to those that are "worth the cost" (e.g., for which the individual's willingness to pay exceeds the uninsured true cost of the services), utilization review and other managed-care programs have been adopted widely to guide treatment for mental disorders. Both demand- and supply-side incentives have been developed for most other health problems, and the effect of these provisions is likely to differ depending on the acuteness, predictability, and treatment intensity choices associated with the specific health problem. For example, in

contrast to many mental health problems, heart attacks or cancers will always require treatment, though intensity may vary considerably. Pregnancy and childbirth are much more predictable than fractured bones. By investigating plan effects across these different types of health problems, we hope to gain insight into how plan provisions affect expenditures.

B. Inclusive Cost.

The data in Table 6 pertain to costs associated with specific diagnoses using diagnoses reported on individual claims. But many diagnoses are associated with expenditures for other conditions. For example, treatment for substance abuse may be accompanied by treatment for a mental disorder. Similarly, patients who are smokers are at higher risk for complications from both heart disease and cancer. In addition, some claims may be associated with nonspecific codes. The FIRM longitudinal data permit detailed tracking of all claims of a person with a specific diagnoses. We use "inclusive cost" to refer to all the medical costs for an individual with a specific diagnosis—like substance abuse, for example—calculated by including all other expenditures by the individual.

Table 7 shows inclusive costs for selected diagnoses from Table 6. Substance abuse, for example, accounts for 17% of the health care costs of

men 18 to 34 covered by the hourly plan. To the extent that individuals with substance abuse problems tend to incur higher costs for treatment of other, potentially related health problems, however, this percentage represents a lower bound on the expenditures attributable to substance abuse. The inclusive cost for substance abuse is 33%, and represents an upper bound on health care costs attributable to substance abuse.

Although for other diseases the differences between direct and inclusive costs are less dramatic, they are large nonetheless. For example, the direct cost of all cancers accounts for 18% of the health care expenditures of women over 55 covered by the salaried plan. The inclusive cost of cancers for women in this age group is 27%. As mentioned above, both the inclusive and the exclusive costs may exaggerate the costs for the treatment of a particular problem. For example, these measures do not distinguish expenditures by individuals who have breast cancer from expenditures by women who were given a diagnosis of breast cancer to justify insurance payment for a mammogram. We are currently refining our cost measures to distinguish individuals who simply undergo general screening for a disease from those who undergo more intensive diagnostic evaluation to "rule out" the disease and from those who undergo treatments of different intensity for the disease itself. By distinguishing screening tests and diagnostic evaluations from treatment,

these "disease" cost measures will permit a more detailed description of how health care dollars are spent.

IV. HOW LONG DO THEY KEEP SPENDING?

Many studies have documented that medical expenditures in a particular year are concentrated among a small proportion of the insured. Less evidence, and hence less attention, has been directed to the persistence of individual expenditures over longer time periods and to the relationship between persistence and the concentration of expenditures. Consequently little attention has been directed to the implications of these issues for insurance markets. Together, both have important implications for insurance markets in general and in particular for the feasibility, incidence, and other consequences of proposals for insurance market reforms. We present preliminary evidence on these issues using longitudinal individual claims data for the period 1989 to 1991. We consider first a tabular description of the relationship between expenditures in two successive years. We then present a more detailed descriptions of persistence, considering expenditures in consecutive years conditional on the decile ranking of expenditures in the first year. Finally, to illustrate the potential importance of persistence in expenditures, we consider

the effect of persistence on individual medical expenses under alternative hypothetical insurance reforms.

A. Concentration and Persistence.

Medical Claims in Successive Years: The distribution of expenditures in 1990 conditional on 1989 expenditures are shown by age in Table 8. Consider persons 18 to 35, for example. Conditional on no expenditure in 1989, 12% of persons have expenditures above $1,000 in 1990. In contrast, over 32% of persons with expenditures above $1,000 in 1989 have expenditures above $1,000 in 1990. Persistence appears to increase with age. Almost 46% of persons 46 to 55 who had expenditures greater $1,000 in 1989 also had expenditures greater than $1,000 in 1990. In contrast, only 15% of persons in this age group with no expenditure in 1989 had expenditures above $1,000 in 1990. This persistence in expenditures produces concentration of expenditures even over extended time periods.

Individual Concentration of Expenditures: The relationship between persistence and concentration is shown in Figure 2. The Figure shows that in 1989 about 80% of cost was incurred by 10 percent of enrollees, roughly comparable to concentration results from other studies. Fifty percent of employees incurred virtually no cost. Figure 2 also shows the concentration of

average annual expenditures over the two-year period of 1989 to 1990, and over the three-year period of 1989 to 1991. If there were little persistence in cost from one year to the next, costs averaged over several years would be much less concentrated among a few enrollees than costs in a single year. The curves show that although concentration declines as the time period increases, even over three years a small proportion of employees incur an enormous fraction of health care costs. Averaged over three years, 10% of enrollees account for a full 65% of expenditures. If there were no persistence from year to year, then averaged over many years the cost accounted for by the highest-cost decile would approach 10%; averaged over three years the top 10% of individuals would only account for 33% of expenditures.

Expenditure Decile and Subsequent Expenditures. Table 8 shows persistence in expenditures for all age groups. Figure 3 presents a more detailed picture of persistence for all ages combined. Enrollees are divided into deciles based on 1989 claims. The figure shows expenditures in 1989 by decile, and then, also by 1989 decile, average annual expenditures over the two-year period 1989-1990 and over the three-year period 1989-1991. For comparison, the figure also shows average expenditures for all enrollees over these three time periods. The average was $1,314. Persons in the tenth decile in 1989 spent over eight times as much in that year as the average

expenditure. Even averaged over the entire three-year period persons who were in the top decile in 1989 spent about five times as much as the average employee.

An alternative description is shown in Figures 4a and 4b. Figure 4a shows the distribution of costs by quintile over the 1989 to 1991 period for each 1989 quintile (determined by 1989 expenditures). The figure shows, for example, that almost 60% of persons who were in the highest quintile in 1989 were also in the highest quintile averaged over three years. Another 35% were in the second highest quintile averaged over three years. By contrast fewer than 10% of persons in the lowest 1989 quintile were in the highest quintile over three years, and only about 10% were in the second highest quintile. Figure 4b shows the distribution of costs over the 1990 to 1991 period conditional on the 1989 quintile. Over 60% of persons in the highest quintile in 1989 are in the highest two quintiles averaged over the next two years; only about 25% of persons in the lowest 1989 quintile were in these two quintiles in the next two-year period.

B. Illustration: Persistence, Premiums, and Experience Rating.

To help to understand the implications of persistence, we consider a simple hypothetical example with decile-based experience rating. For this

illustration, we treat persons in the firm as a population of insured employees. (To focus on pure persistence effects, we set aside any behavioral effects of plan provisions on expenditures.) We consider the incidence of expenditures under three alternative health insurance plans:

Plan 1 "First-dollar" coverage; no deductibles or copayments

Plan 2 $1,000 deductible, a 20% copayment, $4,000 annual maximum payment

Plan 3 "Catastrophic" coverage; $4,000 deductible

We divide individuals into ten groups (deciles) based on 1989 claims. For the purposes of this illustration, we consider two different scenarios: (1) That expenditures for the next two years are predicted on the basis of expenditure in the first and that the premia are set to cover costs over that time period. (2) That cost over the three years can be predicted accurately and that the premia are set to cover costs over the three-year period. [1] Taking as given the expenditures of persons in the sample, we determine the amount that would

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[1]Suppose that individual expenditures are observed for one year (or alternatively, that at the beginning of the period the insurer has enough information to predict the individual's spending decile for that year perfectly), and this experience is used to predict expenditures for the next two years; also suppose that average second- and third-year expenditures by first-year decile can be forecast accurately. Then premiums charged to individuals will be based on the average of insurance payments over three years, 1989 to 1991, with experience rating based on the 1989 decile. Or, alternatively, that 1989 cost are observed, that they are used to predict 1990 and 1991 costs, and that -- as is not uncommon in firm plans -- the premia are set to cover the costs of all three years, in the case of 1989, the ex-post costs.

have been paid by each individual based on the plan deductible, copayment, and the maximum. Then the "premium" is set to cover the remaining costs after employee payments. Defined in this way, the premium is the actuarially fair cost of the insurance conditional on each individual's (predictable) expenditures, exclusive of administrative charges.

To give an idea how these plans might compare with existing FIRM plans, we have calculated actuarially-fair premia for the FIRM plans and the hypothetical plans:

Plan	Average Fair "Premium"	Total Expenditure	"Premium" /Expenditure
Hourly FIRM Plan	1,457	1,459	100%
Salaried FIRM Plan	1,229	1,374	89%
All FIRM employees	1,397	1,437	97%
Illustrative Plan 1	1,437	1,437	100%
Illustrative Plan 2	961	1,437	67%
Illustrative Plan 3	770	1,437	54%

The illustrative plans do not account for any behavioral response to plan provisions and thus total expenditure under each of them is the same as the FIRM total. But because of different provisions, within-decile cost sharing differs across plans; how much the lower-cost employees within a decile share the greater expenditures of higher-cost employees within that decile depends on the deductible, for example. Plan 1 is more expensive than the average cost for all FIRM employees because plan 1 assumes that all employees have

first-dollar coverage, not just hourly employees. The premium for the catastrophic plan 3—which is the basis for a specific illustration discussed below—is much less that the FIRM premia for either the hourly or the salaried plans.

The premium under each plan for each 1989 decile is shown in Figure 5a and 5b, by plan. The figure also shows the "community" average premium over employees in all deciles. Figure 5a demonstrates that if the premium for the 1990 to 1991 period is based on 1989 expenditures, the insurance cost for the highest decile is several times as large as the average premium and many times as large as the premium for persons in the first five of six 1989 deciles. If premia are based on the average of claims over three years (covering 1989 as well as 1990 and 1991 claims), the disparity is even greater. For example, under plan 1 the premium for the highest decile is over 5 times as large as the amount paid by the average employee and almost 12 to 16 times the premia paid by the lowest five or six deciles. (The Figures also show that much more redistribution of costs is possible under all three plans when individuals from the ten deciles are pooled.)

These inequalities reflect two features of the illustration: First, persons who have large claims in 1989 also have large claims in the next two years. Second, persons with low claims in the first year also have low claims in

subsequent years and hence a large proportion of their claims are paid out-of-pocket; thus their premiums are low.

Plan 3 is of particular interest; it would provide strong demand-side incentives and would be very inexpensive relative to FIRM's current plans. The community premium for such a plan would be only about $770 per year. Yet with decile-based experience rating, the tenth decile would incur a premium of about $3,200 to cover expected expenditures over the next two years (Figure 5a). If premia were to cover all costs over the three-year period, the premium for the tenth decile would be over $4,300 annually even for this limited insurance (Figure 5b). The experience-rated and community premia for this plan are show in Figure 6 for 1990 and for the 1990 to 1991 time periods by 1989 quintile. We continue the Plan 3 illustration in the next section.

C. Illustration: Persistence and Out-of-Pocket Payments Under Plan 3.

The high-deductible Plan 3 also helps to illustrate the effect of persistence on the feasibility of some alternative insurance arrangements intended to promote efficient medical spending. We consider an illustrative individual health account (IHA) scheme: the firm establishes a "community" insurance plan like plan 3, accompanied by a special IHA plan for each

employee. Each year $2,000, say, is deposited by the firm in each employee's IHA. Expenses under the $4,000 deductible are paid out of the IHA balance. In effect, individuals are "paid" more to accept a high-deductible plan. (Without behavioral responses, we do not consider in this illustration the extent to which the plan pays for itself.) Assets remaining in the IHA, say at retirement, are available for other purposes. The reason for the parallel insurance and saving plans, of course, is that now each employee is spending his or her "own" money for medical care, except in the event of a serious illness. Thus, the employee would be more inclined to limit expenditures to those that the employee believes are really worth the cost.

Persistence can have important effects on the distribution of financial outcomes under such an IHA scheme. To demonstrate, Figures 7a and 7b show the average annual out-of-pocket cost of employees in over selected time periods by 1989 spending decile. Even over the two-year 1990 to 1991 period, individuals in the highest 1989 decile would spend an average of over $1,300 per year on health care, above the plan premium (Figure 7a). The average expenditure for employees in the bottom five or six quintiles would be about $400. Over the three-year period 1989 to 1990 employees in the top 1989 deciles would spend over $2,200 per year, while employees in the lowest decile would spend about $340 per year. In contrast to the substantial net losses in

the highest decile, individuals in the lowest deciles would accumulate close to $5,000 in IHA savings during the three-year period. Thus, even over an extended period of time, the scheme resembles a saving plan for many employees and an individual self-insurance plan for some. In a sense, the persistence in health care expenditures takes the insurance out of the insurance plan. This is an issue that we will explore in much more depth in future research, giving more attention to persistence over longer time periods and to specific plan provisions, and distinguishing the redistribution and insurance effects of alternative pooling arrangements.

IV. CONCLUSION.

We have described the pattern of expenditures in a large corporation: who spends? on what? for how long? There are three noticeable features of spending: (1) The differences in the provisions of the two FIRM plans seem to have substantial effects on health care expenditures. Inpatient expenditures are a much larger fraction of the total under the hourly plan. (2) Substance abuse and other mental health disorders account for a surprisingly large fraction of health care costs. (3) The components of health care cost differ substantially across individuals, demographic groups, and plans, suggesting that further analysis of the "micro" details of medical expenditures may help to

assess the probable implications of alternative insurance reforms. (4) There is substantial persistence in individual health care expenditures from year to year. Illustrative calculations suggest that this persistence may lead to considerable inequality in individual costs under demand-side insurance reforms such as those coupled with IHA saving plans, and thus may place important limitations on plans that might otherwise be attractive. We will explore the implications of these issues much more thoroughly in future research. The exploratory analysis contained in this paper suggests that firm data can provide important insights into the black box that erupts expenditures under private insurance plans. And, hence may provide greater understanding of how plan reforms may affect expenditures.

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Table 1. Total Enrollment and Percent Distribution, by Plan Type and Employee Status, 1990.			
	Hourly	Salaried	Total
Active Employees Only			
Traditional	69902	18736	88638
	67.26%	44.00%	60.50%
PPO	14196	6677	31365
	13.66%	15.68%	21.41%
HMO	19830	17169	26507
	19.08%	40.32%	18.09%
Total	103928	42582	146510
	100%	100%	100%
Active and Retired Employees			
Traditional	141947	48708	190655
	76.55%	61.55%	72.06%
PPO	16671	8454	25125
	8.99%	10.68%	9.50%
HMO	26819	21972	48791
	14.46%	27.77%	18.44%
Total	185437	79134	264571
	100%	100%	100%

Table 2. Active Employee Enrollment and Percent Distribution, by Plan Type and Employee Status, and by Year.			
	Hourly	Salaried	Total
1989			
Traditional	70253	19398	89651
	67.55%	45.35%	61.08%
HMO	19446	15859	35305
	18.70%	37.08%	24.05%
PPO	14303	7518	21821
	13.75%	17.58%	14.87%
Total	104002	42775	146777
	100%	100%	100%
1990			
Traditional	69902	18736	88638
	67.26%	44.00%	60.50%
HMO	19830	17169	36999
	19.08%	40.32%	25.25%
PPO	14196	6677	20873
	13.66%	15.68%	14.25%
Total	103928	42582	146510
	100%	100%	100%
1991			
Traditional	67512	16321	83833
	65.35%	38.79%	57.66%
HMO	19301	17254	36555
	18.68%	41.01%	25.14%
PPO	16492	8502	24994
	15.96%	20.21%	17.19%
Total	103305	42077	145382
	100%	100%	100%
1992			
Traditional	63994	16271	80265
	63.61%	39.16%	56.46%
HMO	19769	16719	36488
	19.65%	40.24%	25.67%
PPO	16840	8559	25399
	16.74%	20.60%	17.87%
Total	100603	41549	142152
	100%	100%	100%

Table 3. Cost of Traditional Plan Health Care, by Age and Employee Status, 1990. (In Millions of Dollars)							
Age	Hourly			Salaried			Total
	Total	Active	Retired	Total	Active	Retired	
Total Cost, Including Dependents							
0-17	36.4	32.6	3.8	8.0	7.7	0.3	44.4
18-34	45.0	39.4	5.6	13.0	11.6	1.4	58.0
35-44	62.3	57.6	4.7	13.3	12.3	1.0	75.6
45-54	95.8	77.4	18.4	26.6	22.0	4.6	122.4
55-64	121.3	47.3	74.0	49.9	14.4	35.5	171.2
Total	360.8	254.3	106.5	110.8	68.0	42.8	471.6
Cost of Employees Only							
0-17	0.008	0.006	0.002	0.0013	0.0007	0.0006	0.0093
18-34	11.9	10.8	1.1	3.1	2.8	0.3	15.0
35-44	35.8	33.3	2.5	6.3	5.8	0.5	42.1
45-54	54.8	45.6	9.2	14.5	12.1	2.4	69.3
55-64	73.8	31.9	41.9	30.4	9.8	20.6	104.2
Total	176.31	121.61	54.70	54.30	30.50	23.80	230.61

Table 4. Claims by Gender, Age, Hourly Versus Salaried, and Inpatient Versus Outpatient.				
Age Groups	Hourly		Salaried	
	Males	Females	Males	Females
Population				
0-17	32,642	30,741	8,867	8,654
18-34	22,390	24,472	9,217	10,545
35-44	23,135	22,010	5,977	7,066
45-54	25,459	19,736	7,959	7,355
55-64	11,367	6,275	3,778	2,568
All Employees	114,993	103,234	35,798	36,188
Average Expenditure—Firm 2				
0-17	$547	$533	$601	$547
18-34	$825	$1,003	$601	$1,060
35-44	$1,283	$1,335	$899	$1,383
45-54	$1,645	$1,741	$1,467	$1,636
55-64	$2,786	$3,004	$2,941	$2,477
All Employees	$1,213	$1,196	$1,090	$1,218
Average Inpatient Expenditure—Firm 2				
0-17	$294	$310	$279	$245
18-34	$503	$601	$271	$566
35-44	$783	$718	$393	$570
45-54	$1,023	$962	$730	$664
55-64	$1,834	$1,825	$1,655	$1,190
All Employees	$747	$683	$541	$554
Average Outpatient Expenditure—Firm 2				
0-17	$252	$223	$322	$301
18-34	$323	$402	$330	$494
35-44	$500	$617	$507	$813
45-54	$622	$779	$737	$973
55-64	$952	$1,180	$1,286	$1,287
All Employees	$467	$514	$549	$664

Table 5. NMES Expenditures by Gender, Age, and Hourly Versus Salaried Status.				
Age Groups	Hourly		Salaried	
	Males	Females	Males	Females
Population				
0-17	637	612	419	381
18-34	573	552	367	370
35-44	328	355	259	232
45-54	232	227	172	156
55-64	119	92	144	118
All	1,889	1,838	1,361	1,257
Average Expenditure				
0-17	$638	610	454	1,107
18-34	595	919	363	1,179
35-44	421	865	457	1,052
45-54	478	896	1,559	1,345
55-64	2,857	1,699	789	1,440
All	707	842	605	1,179
All, FIRM Weights	770	858	712	1,189
Ratio of FIRM to NMES Average				
0-17	0.83	0.87	1.32	0.49
18-34	1.39	1.09	1.66	0.90
35-44	3.05	1.54	1.97	1.31
45-54	3.44	1.94	0.94	1.22
55-64	0.98	1.77	3.73	1.72
All, Firm Weights	1.69	1.42	1.79	1.03

Table 6. Percent of Claims Accounted for by 26 Diagnoses: by Gender, Age, and Hourly Versus Salaried Status.										
	Hourly: Males					Hourly: Females				
	0-17	18-34	35-44	45-54	55+	0-17	18-34	35-44	45-54	55+
Enrollees	32,642	22,390	23,135	25,459	11,367	30,741	24,472	22,010	19,736	6,275
All diseases: Total Cost (Millions)	$17.8	$18.5	$29.7	$41.9	$31.7	$16.4	$24.5	$29.4	$34.4	$18.9
All diseases: Average Cost	$547	$825	$1,283	$1,645	$2,785	$533	$1,003	$1,335	$1,741	$3,004
Top 26: Average	$237	$444	$695	$789	$1,306	$245	$566	$666	$768	$1,332
Top 26: % of Total	43%	54%	54%	48%	47%	46%	56%	50%	44%	44%
Top 26										
Substance Abuse	5%	20%	18%	7%	2%	3%	5%	2%	1%	0%
Ischemic Heart Disease	0%	0%	3%	9%	11%	0%	0%	1%	3%	7%
Affective/Acute Psychotic Disorders	6%	7%	7%	3%	1%	9%	5%	5%	3%	1%
Pregnancy and Childbirth	2%	0%	0%	0%	0%	8%	23%	4%	0%	0%
Back/Spine Disorders	1%	3%	5%	4%	3%	1%	2%	4%	4%	3%
Neurotic Disorders	7%	3%	3%	1%	0%	8%	3%	3%	1%	1%
Muscle/Ligament Disorders & Internal Derangements	3%	4%	3%	2%	2%	3%	2%	2%	3%	2%
Other Cancers	1%	1%	2%	3%	5%	1%	1%	2%	3%	5%
Limb Injury	6%	4%	3%	2%	1%	3%	1%	1%	1%	2%
Benign Female Pelvic Complaints	0%	0%	0%	0%	0%	1%	4%	8%	4%	1%
Other Heart Disease	0%	1%	1%	2%	4%	0%	0%	2%	2%	5%
Chest Pain	0%	1%	2%	2%	2%	0%	0%	1%	2%	2%
Acute Myocardial Infarction	0%	0%	1%	3%	4%	0%	0%	0%	1%	2%
Head Injury	5%	6%	1%	1%	0%	2%	2%	0%	0%	0%
Chronic Pulmonary Disease	3%	1%	1%	1%	1%	1%	1%	1%	2%	2%
Gallbladder/Biliary Tract Disease	0%	0%	1%	1%	1%	0%	2%	2%	2%	2%
Pneumonia	1%	1%	1%	1%	2%	2%	1%	1%	1%	2%
Breast Cancer	0%	0%	0%	0%	0%	0%	1%	2%	3%	3%
Acute Upper Resp Disease	2%	1%	1%	0%	1%	2%	1%	1%	1%	1%
Urinary Tract/Pelvic Infections	0%	0%	0%	0%	0%	1%	2%	2%	1%	1%
Intestinal Diseases	0%	0%	1%	1%	1%	0%	0%	1%	2%	1%
Gastric Disorders	0%	1%	1%	1%	1%	0%	0%	1%	1%	1%
Lung Cancer	0%	0%	0%	2%	2%	0%	0%	0%	1%	1%
Menstrual/Abnormal Bleading Disorders (Female)	0%	0%	0%	0%	0%	0%	1%	2%	1%	0%
Colorectal Cancers	0%	0%	0%	1%	2%	0%	0%	0%	1%	1%
Prostate Cancer	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%
Category Groups										
All Mental Disorders	21%	33%	31%	12%	4%	21%	14%	11%	7%	2%
All Pregnancy and Birth-Related Care	9%	0%	0%	0%	0%	14%	23%	4%	0%	0%
All Heart Diseases	4%	4%	11%	22%	29%	3%	3%	8%	14%	23%
All Cancers	3%	2%	4%	9%	12%	4%	7%	14%	14%	15%

Table 6. Percent of Claims Accounted for by 26 Diagnoses: by Gender, Age, and Hourly Versus Salaried Status.										
	Salaried: Males					Salaried: Females				
	0-17	18-34	35-44	45-54	55+	0-17	18-34	35-44	45-54	55+
Enrollees	8867	9217	5977	7959	3778	8654	10545	7066	7355	2568
All diseases: Total Cost (Millions)	$5.3	$5.5	$5.4	$11.7	$11.1	$4.7	$11.2	$9.8	$12.0	$6.4
All diseases: Average Cost	$601	$601	$899	$1,467	$2,940	$546	$1,060	$1,383	$1,636	$2,477
Top 26: Average	$272	$265	$430	$775	$1,503	$281	$623	$759	$824	$1,140
Top 26: % of Total	45%	44%	48%	53%	51%	51%	59%	55%	50%	46%
Top 26										
Substance Abuse	6%	5%	4%	2%	1%	4%	2%	1%	1%	0%
Ischemic Heart Disease	0%	0%	5%	13%	17%	0%	0%	1%	2%	5%
Affective/Acute Psychotic Disorders	8%	7%	2%	2%	0%	12%	3%	4%	4%	1%
Pregnancy and Childbirth	1%	0%	0%	0%	0%	2%	25%	6%	0%	0%
Back/Spine Disorders	1%	3%	6%	6%	3%	2%	2%	6%	4%	3%
Neurotic Disorders	9%	6%	6%	3%	1%	10%	6%	6%	4%	2%
Muscle/Ligament Disorders & Internal Derangements	4%	7%	5%	3%	2%	4%	3%	3%	4%	3%
Other Cancers	0%	1%	2%	5%	5%	1%	2%	4%	4%	5%
Limb Injury	6%	5%	2%	2%	1%	3%	1%	1%	1%	2%
Benign Female Pelvic Complaints	0%	0%	0%	0%	0%	1%	4%	8%	6%	2%
Other Heart Disease	0%	1%	1%	3%	4%	0%	1%	1%	1%	4%
Chest Pain	0%	1%	2%	2%	1%	0%	0%	1%	1%	1%
Acute Myocardial Infarction	0%	0%	2%	3%	3%	0%	0%	0%	1%	2%
Head Injury	2%	3%	2%	1%	1%	2%	2%	0%	0%	1%
Chronic Pulmonary Disease	2%	1%	1%	1%	1%	2%	1%	1%	1%	1%
Gallbladder/Biliary Tract Disease	0%	0%	1%	1%	1%	0%	1%	1%	2%	2%
Pneumonia	1%	1%	1%	0%	1%	1%	1%	1%	1%	2%
Breast Cancer	0%	0%	0%	0%	0%	0%	0%	4%	4%	4%
Acute Upper Resp Disease	3%	1%	1%	1%	1%	4%	1%	1%	1%	1%
Urinary Tract/Pelvic Infections	1%	1%	1%	1%	0%	2%	3%	2%	1%	1%
Intestinal Diseases	0%	1%	0%	1%	1%	0%	0%	1%	1%	1%
Gastric Disorders	0%	0%	1%	1%	1%	0%	0%	0%	1%	1%
Lung Cancer	0%	0%	0%	1%	1%	0%	0%	0%	1%	0%
Menstrual/Abnormal Bleading Disorders (Female)	0%	0%	0%	0%	0%	0%	1%	3%	3%	1%
Colorectal Cancers	0%	0%	1%	2%	2%	0%	0%	0%	1%	1%
Prostate Cancer	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
Category Groups										
All Mental Disorders	28%	21%	12%	7%	3%	28%	12%	11%	9%	3%
All Pregnancy and Birth-Related Care	7%	2%	1%	1%	0%	8%	26%	7%	1%	0%
All Heart Diseases	3%	7%	13%	28%	33%	4%	4%	5%	9%	19%
All Cancers	3%	3%	7%	10%	16%	3%	8%	19%	20%	16%

Table 7. Percent of Claims Accounted for by Inclusive Costs for Selected Diagnosis Groups										
	Males					Females				
	0-17	18-34	35-44	45-54	55+	0-17	18-34	35-44	45-54	55+
Hourly Employees										
Enrollees	32,642	22,390	23,135	25,459	11,367	30,741	24,472	22,010	19,736	6,275
All diseases: Total Cost (Millions)	$17.8	$18.5	$29.7	$41.9	$31.7	$16.4	$24.5	$29.4	$34.4	$18.9
All diseases: Average Cost	$547	$825	$1,283	$1,645	$2,785	$533	$1,003	$1,335	$1,741	$3,004
Exclusive Costs for Selected Diagnosis Groups:										
All Mental Disorders	16%	13%	13%	5%	2%	18%	9%	9%	6%	2%
Substance Abuse	5%	20%	18%	7%	2%	3%	5%	2%	1%	0%
All Pregnancy and Birth-Related Care	9%	0%	0%	0%	0%	14%	23%	4%	0%	0%
All Heart Diseases	4%	4%	11%	22%	29%	3%	3%	8%	14%	23%
All Cancers	3%	2%	4%	9%	12%	4%	7%	14%	14%	15%
Inclusive Costs for Selected Diagnosis Groups:										
All Mental Disorders	29%	31%	31%	17%	10%	29%	25%	26%	20%	13%
Substance Abuse	10%	33%	32%	14%	4%	6%	9%	5%	3%	1%
All Pregnancy and Birth-Related Care	20%	7%	8%	7%	7%	31%	40%	13%	7%	11%
All Heart Diseases	26%	38%	52%	64%	72%	26%	29%	45%	55%	68%
All Cancers	11%	14%	18%	28%	36%	18%	32%	50%	50%	48%
Salaried Employees										
Enrollees	8867	9217	5977	7959	3778	8654	10545	7066	7355	2568
All diseases: Total Cost (Millions)	$5.3	$5.5	$5.4	$11.7	$11.1	$4.7	$11.2	$9.8	$12.0	$6.4
All diseases: Average Cost	$601	$601	$899	$1,467	$2,940	$546	$1,060	$1,383	$1,636	$2,477
Exclusive Costs for Selected Diagnosis Groups:										
All Mental Disorders	22%	16%	8%	5%	2%	24%	10%	10%	8%	3%
Substance Abuse	6%	5%	4%	2%	1%	4%	2%	1%	1%	0%
All Pregnancy and Birth-Related Care	7%	2%	1%	1%	0%	8%	26%	7%	1%	0%
All Heart Diseases	3%	7%	13%	28%	33%	4%	4%	5%	9%	19%
All Cancers	3%	3%	7%	10%	16%	3%	8%	19%	20%	16%
Inclusive Costs for Selected Diagnosis Groups:										
All Mental Disorders	37%	34%	26%	22%	14%	39%	26%	33%	27%	14%
Substance Abuse	11%	10%	8%	5%	2%	7%	5%	3%	5%	1%
All Pregnancy and Birth-Related Care	22%	13%	10%	10%	13%	21%	52%	21%	14%	11%
All Heart Diseases	27%	40%	57%	72%	82%	30%	34%	44%	59%	72%
All Cancers	14%	19%	33%	36%	53%	20%	45%	65%	66%	62%

Table 8. Percent Distribution of 1990 Expenditures by 1989 Expenditure Interval and by Age.					
Age Category	1989 Expenditure	1990 Expenditure			
		No Expenditure	Below $300	$300-$1,000	Above $1,000
0-17 years	No Expenditure	43.55	37.67	11.44	7.35
	Below $300	45.46	34.79	12.57	7.18
	$300-$1,000	29.10	32.36	22.91	15.64
	Above $1,000	27.03	24.23	20.11	28.64
18-35 years	No Expenditure	39.80	35.06	13.09	12.05
	Below $300	51.56	26.66	11.35	10.43
	$300-$1,000	35.42	25.56	18.88	20.15
	Above $1,000	31.78	19.79	16.28	32.15
36-45 years	No Expenditure	40.34	33.13	13.47	13.06
	Below $300	36.63	33.04	16.03	14.30
	$300-$1,000	24.09	26.87	23.95	25.09
	Above $1,000	18.77	18.90	19.72	42.61
46-55 years	No Expenditure	38.29	32.00	14.42	15.28
	Below $300	31.00	34.29	17.93	16.78
	$300-$1,000	17.90	26.35	28.17	27.59
	Above $1,000	15.34	18.25	20.49	45.91
55-65 years	No Expenditure	35.03	32.78	14.89	17.30
	Below $300	35.79	31.88	16.56	15.77
	$300-$1,000	22.49	24.53	26.74	26.24
	Above $1,000	19.84	16.94	19.39	43.83

Figure 1a. Expenditures of Men and Women by Employee Status.

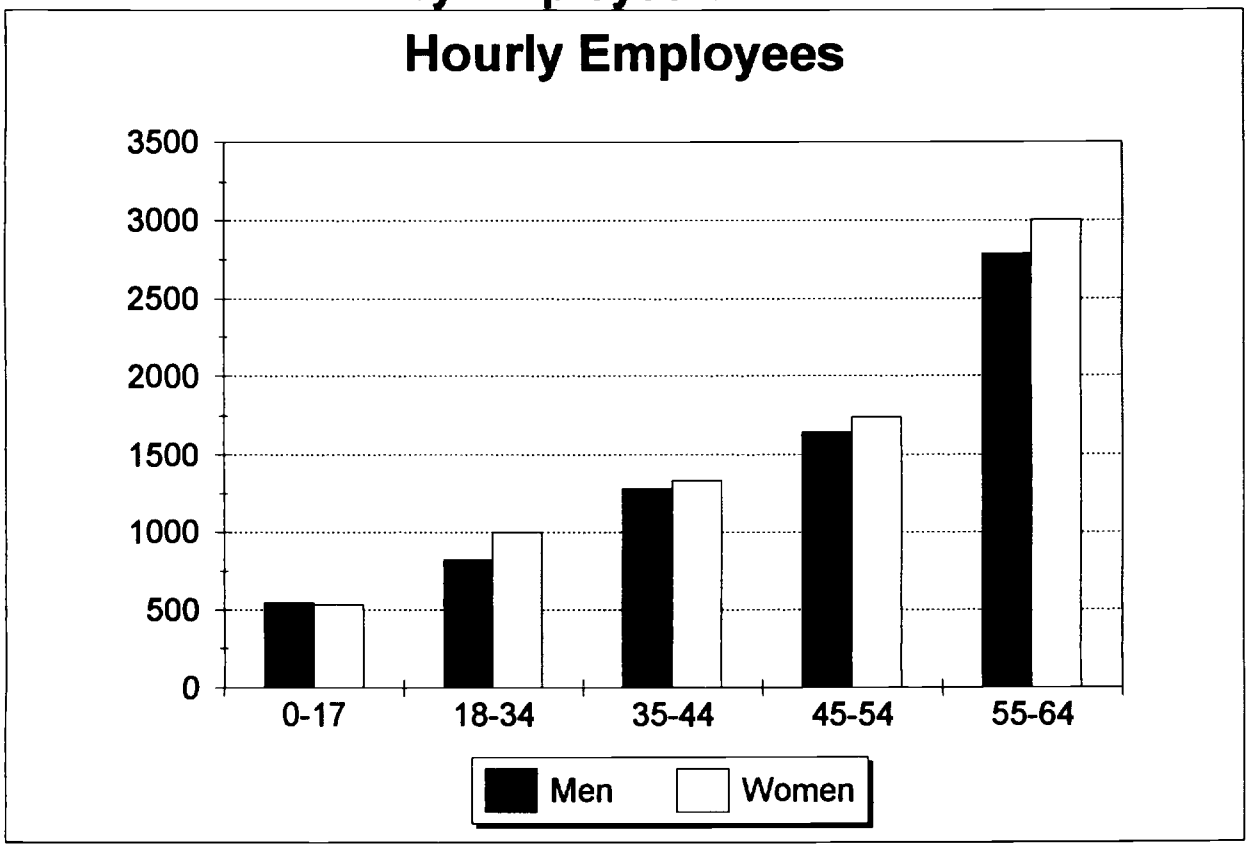
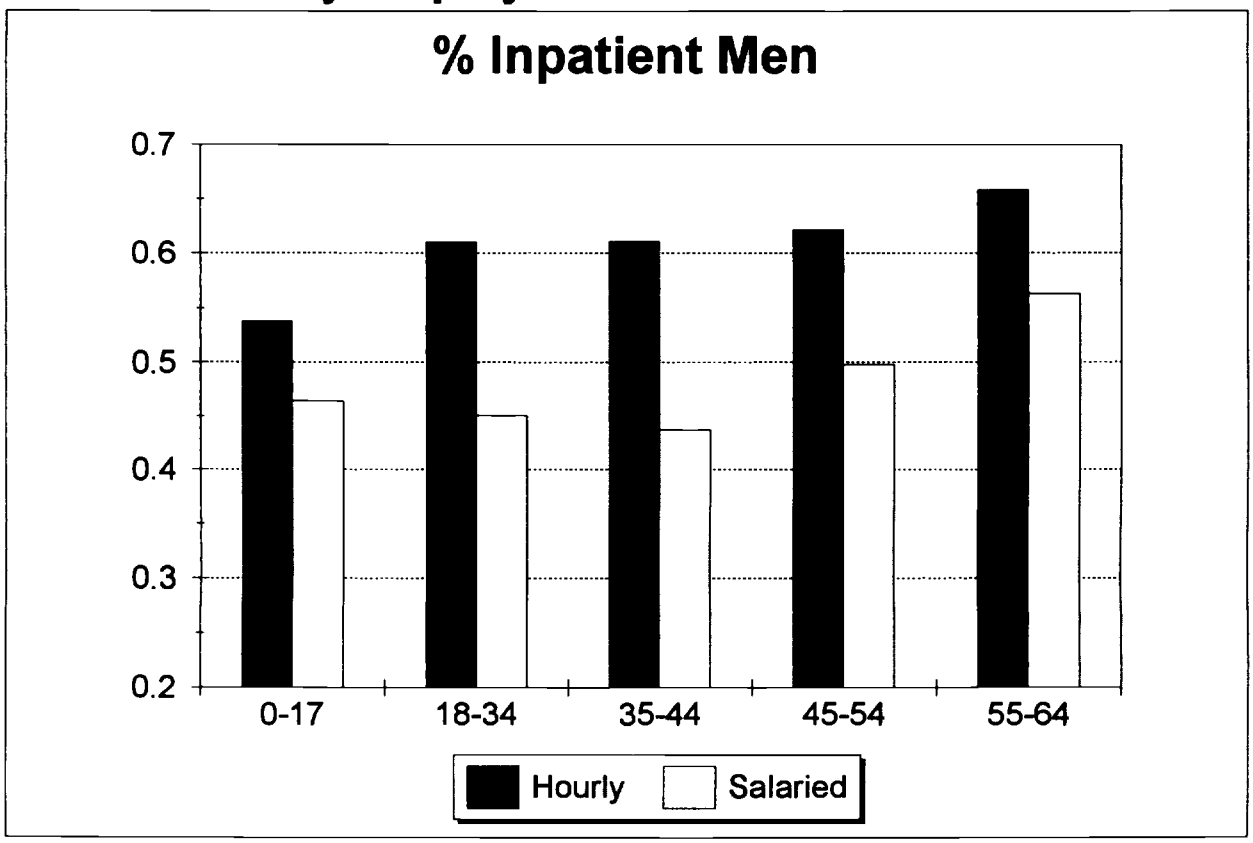


Figure 1b. Percent Inpatient Expenditure by Employee Status and Gender.



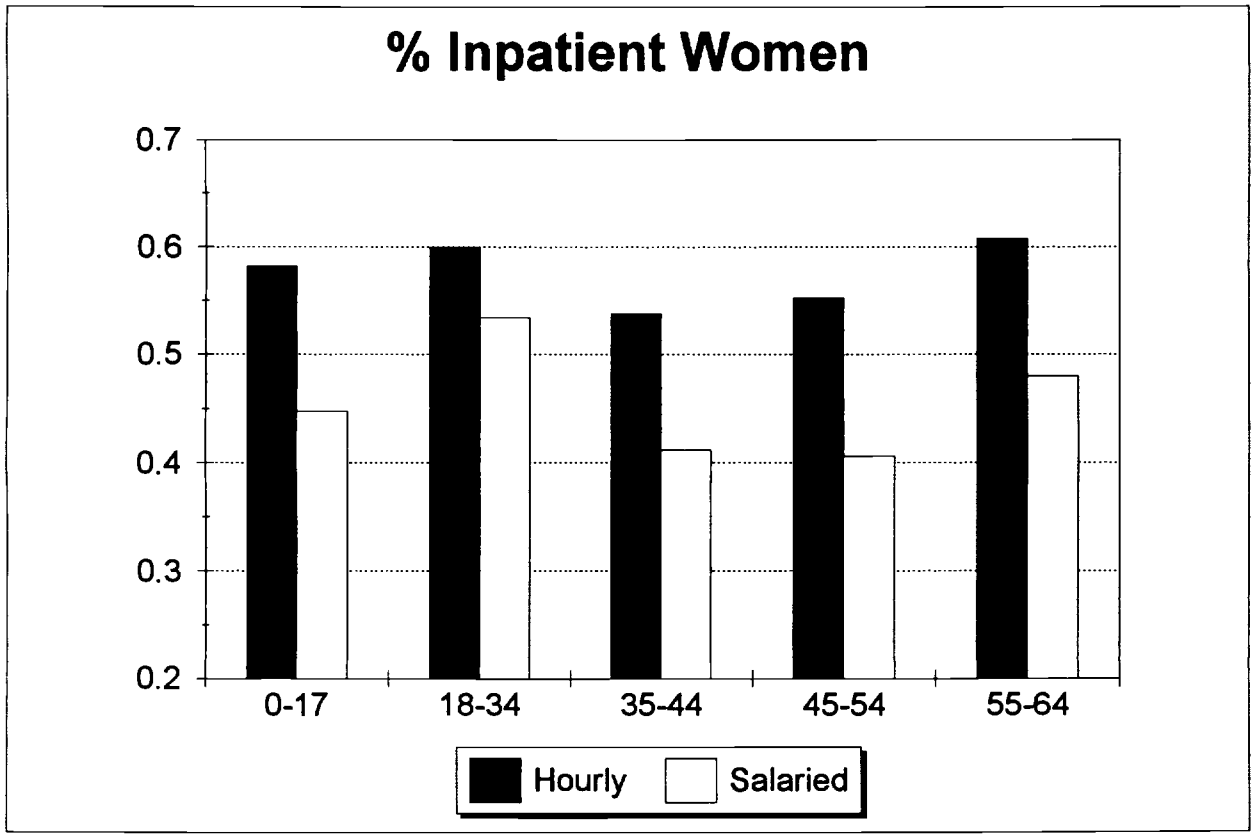
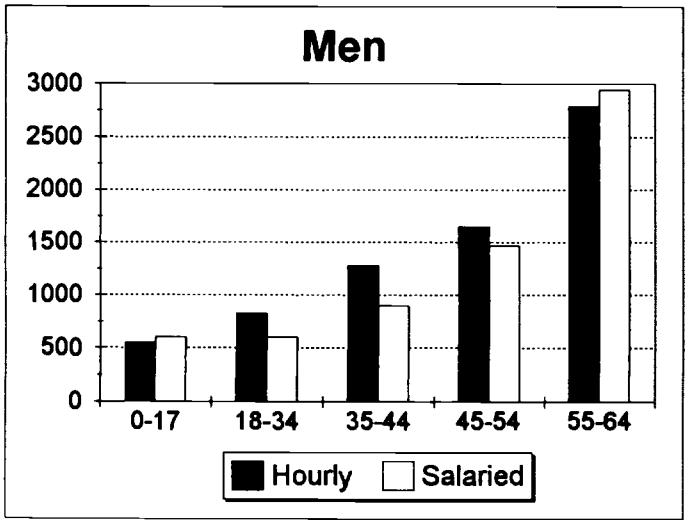
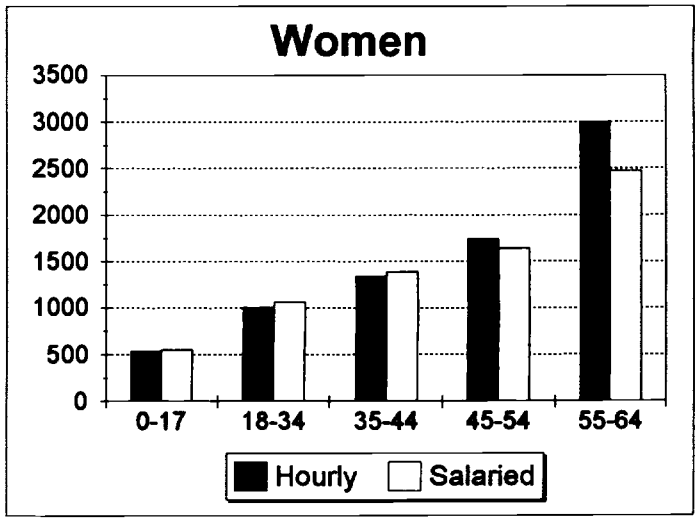
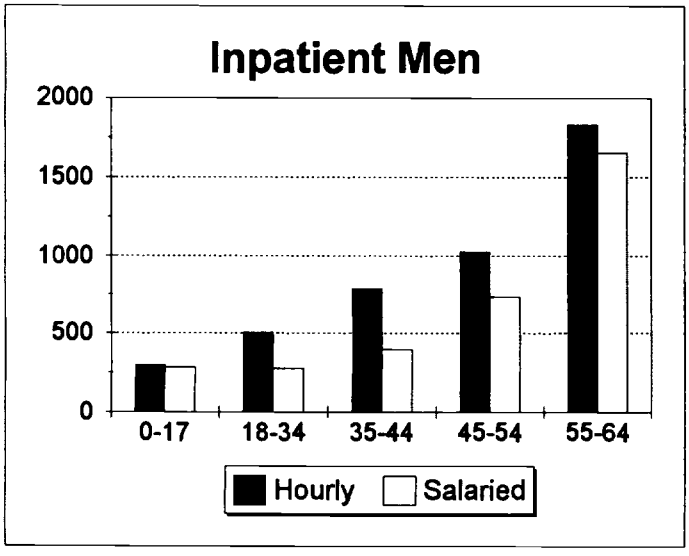
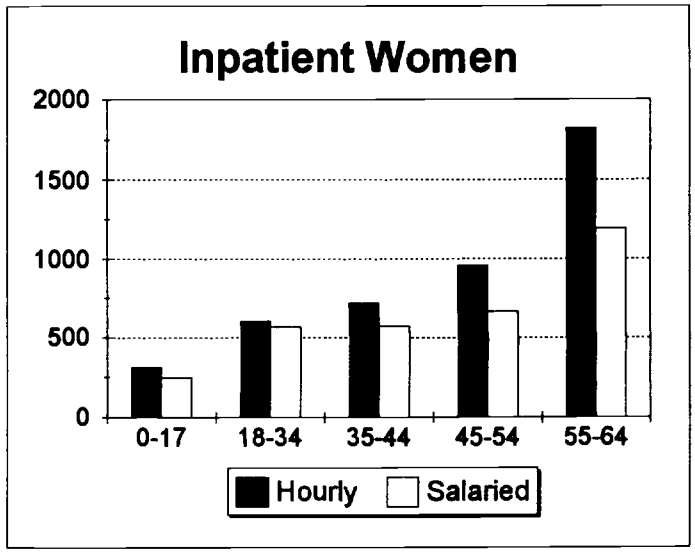


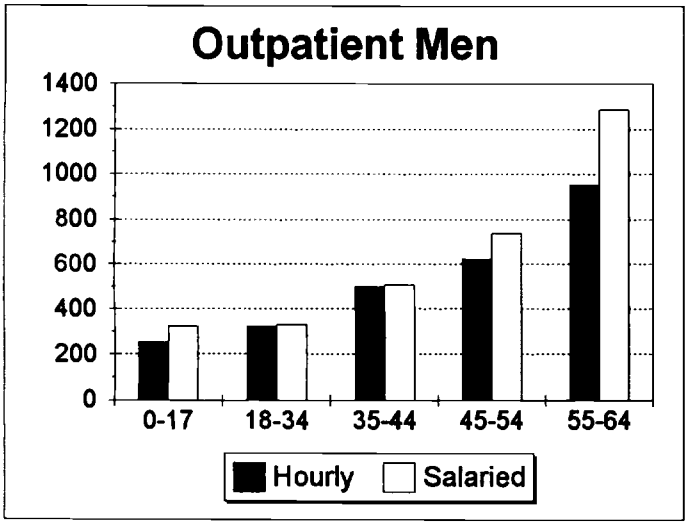
Figure 1c. Average Expenditures
by Employee Status and Gender

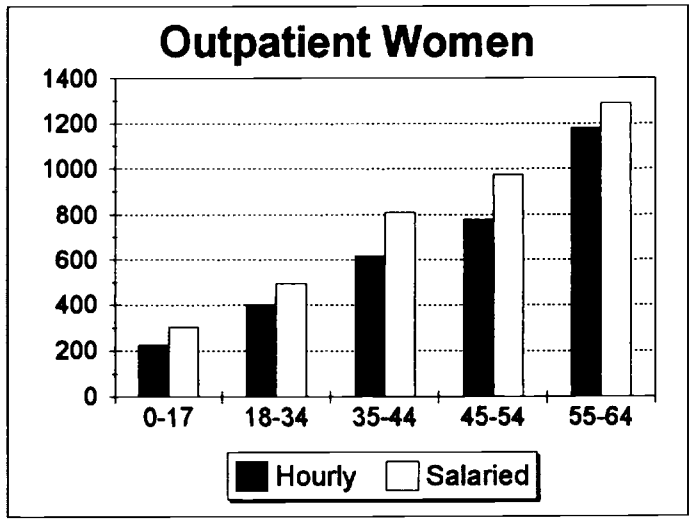












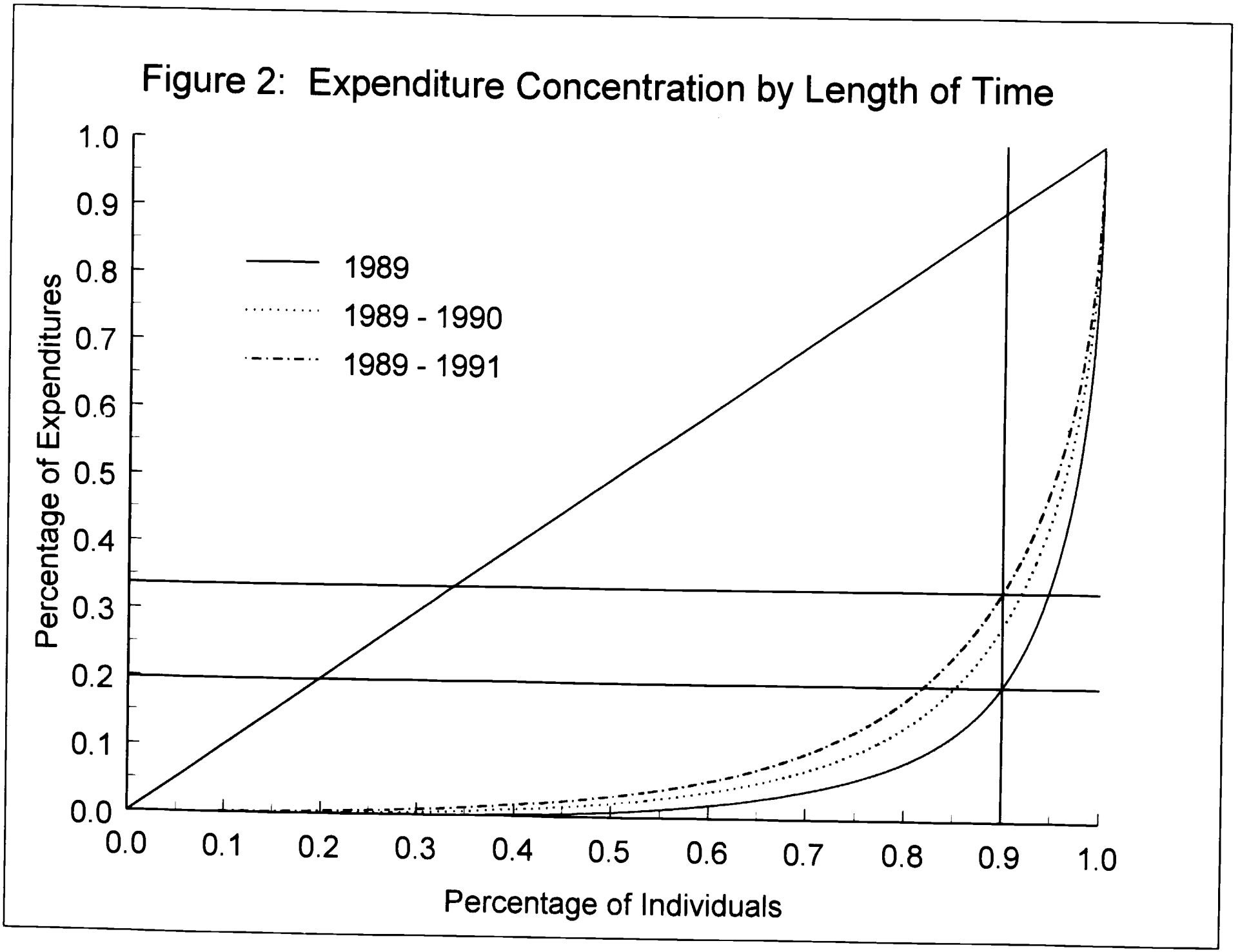
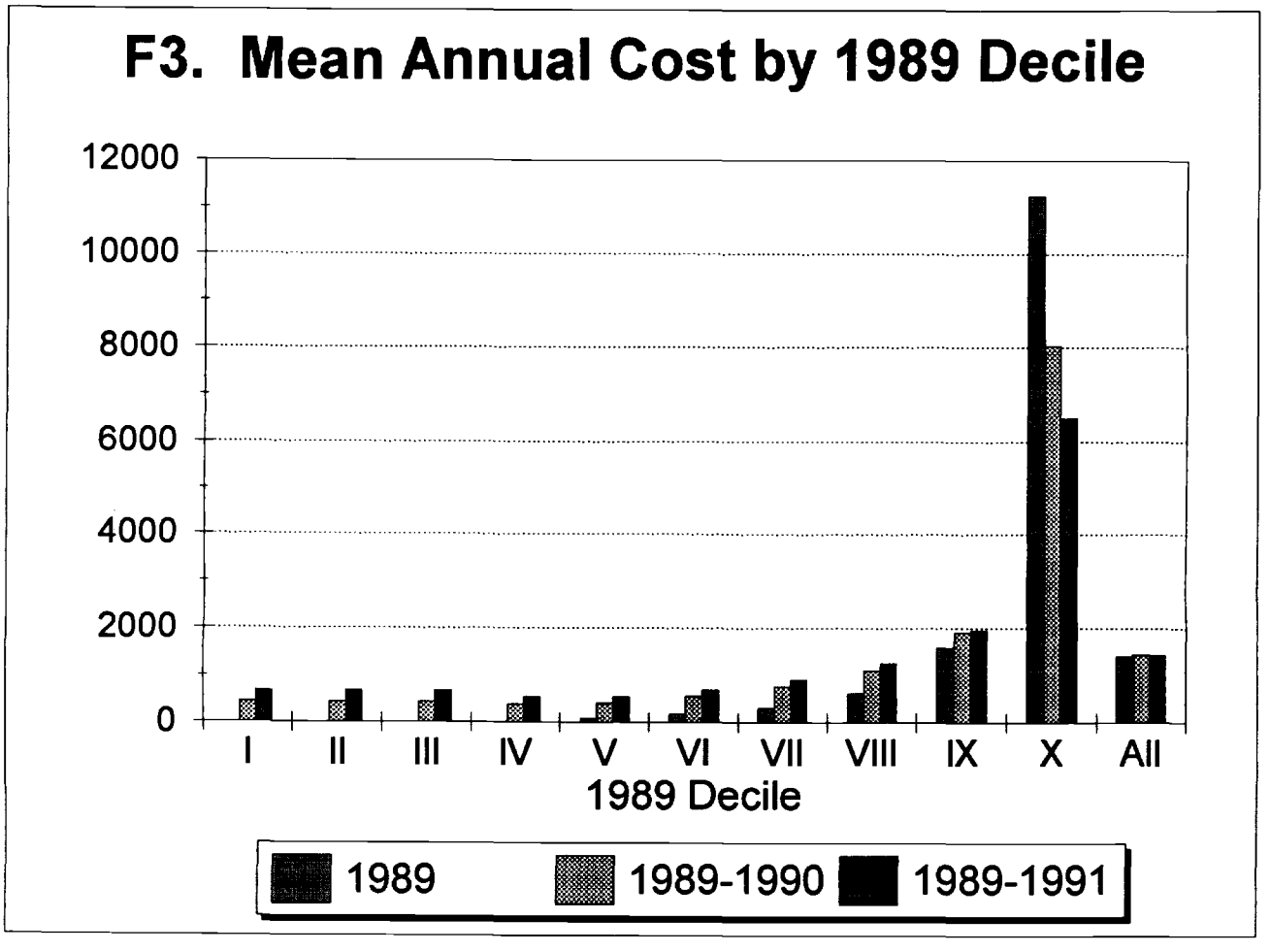
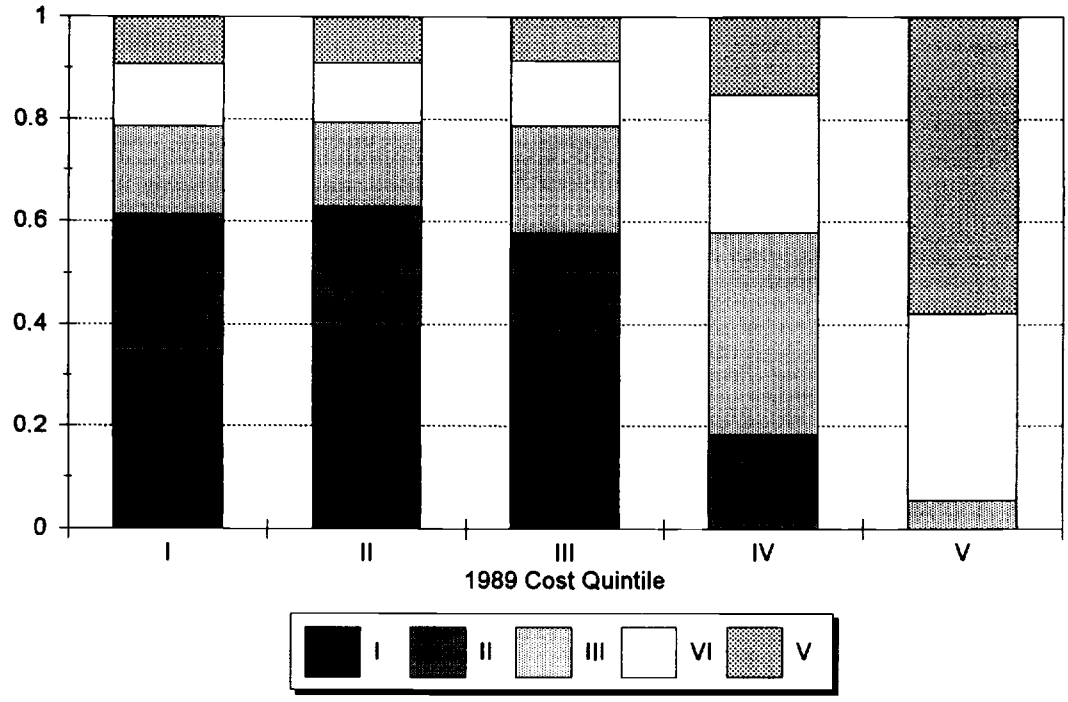


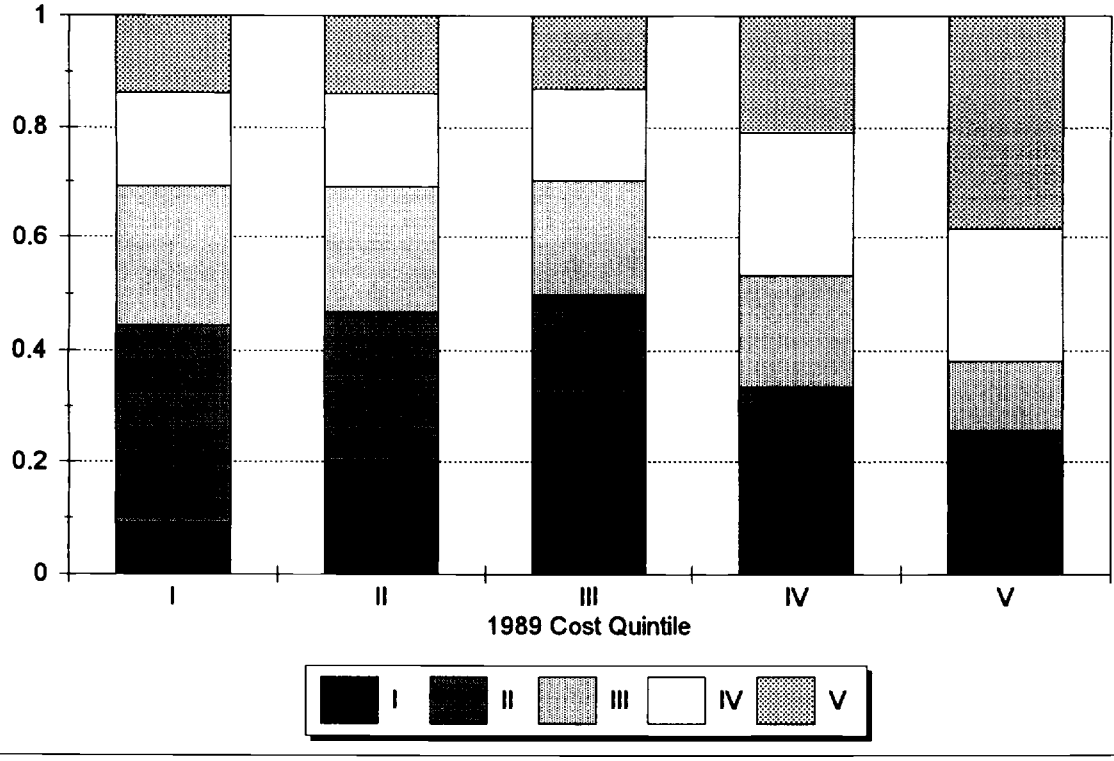
Figure 2: Expenditure Concentration by Length of Time
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Percentage of Expenditures
1989
1989 - 1990
1989 - 1991
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Percentage of Individuals


F3. Mean Annual Cost by 1989 Decile
12000
10000
8000
6000
4000
2000
0
I
II
III
IV
V
VI
VII
VIII
IX
X
All
1989 Decile
1989
1989-1990
1989-1991

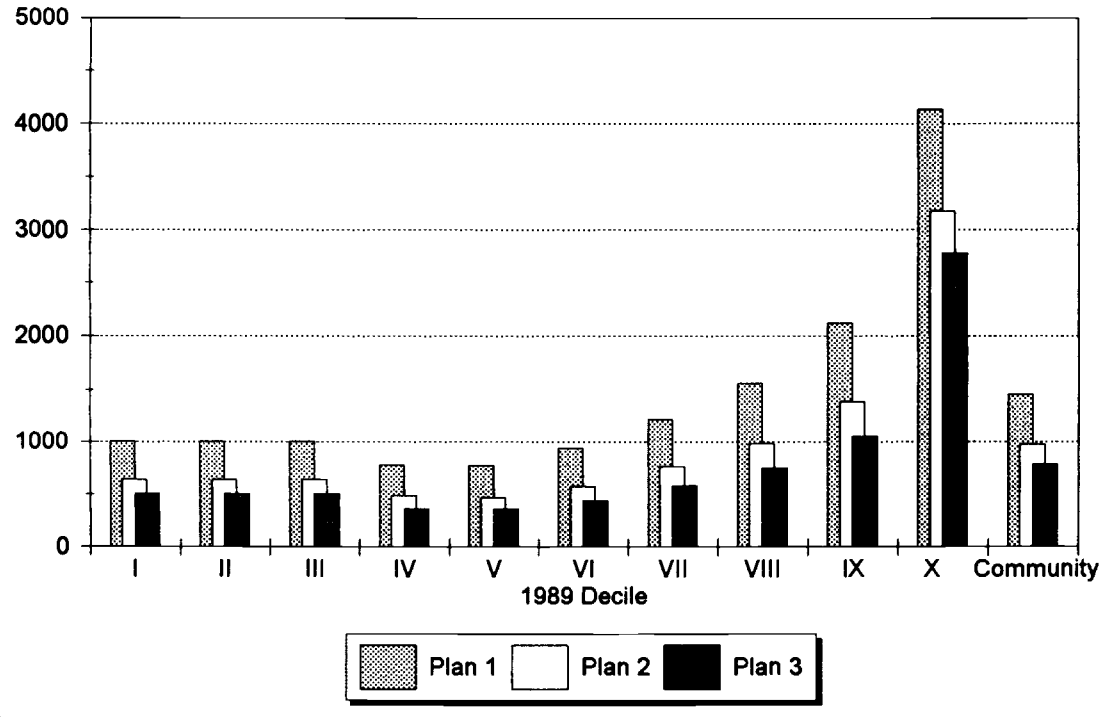
F4a. 1989-1991 Quintile Distribution
By 1989 Cost Quintile



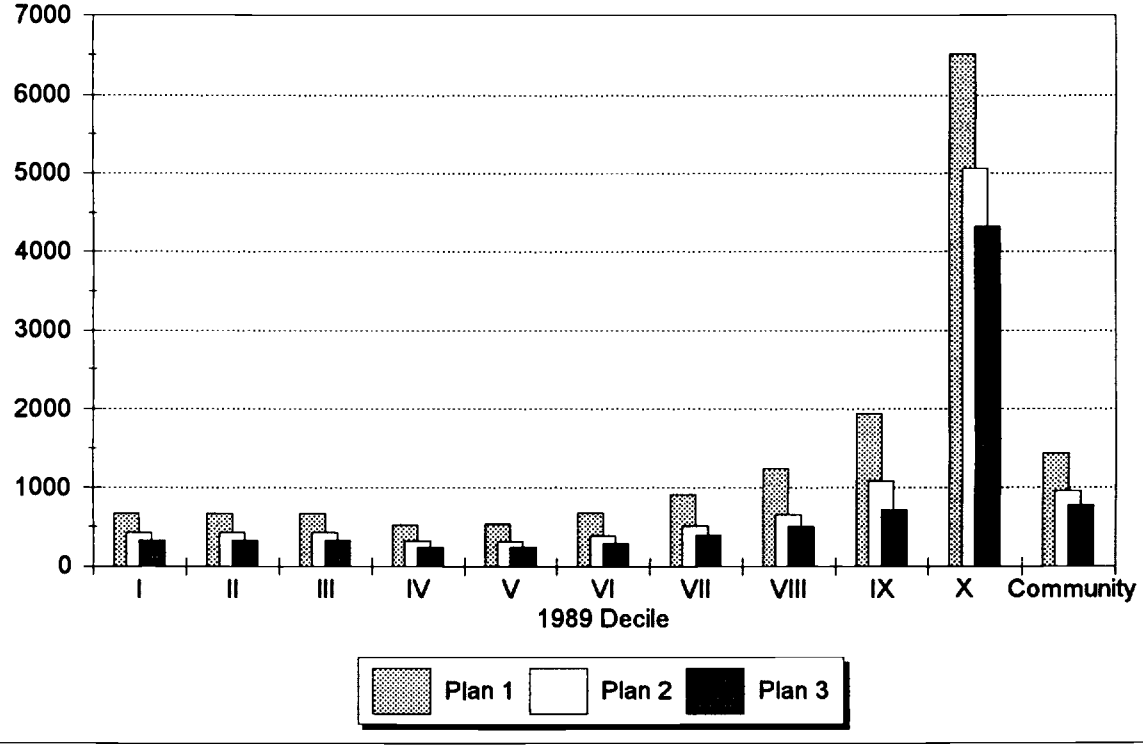
F4b. 1990-1991 Quintile Distribution
By 1989 Cost Quintile

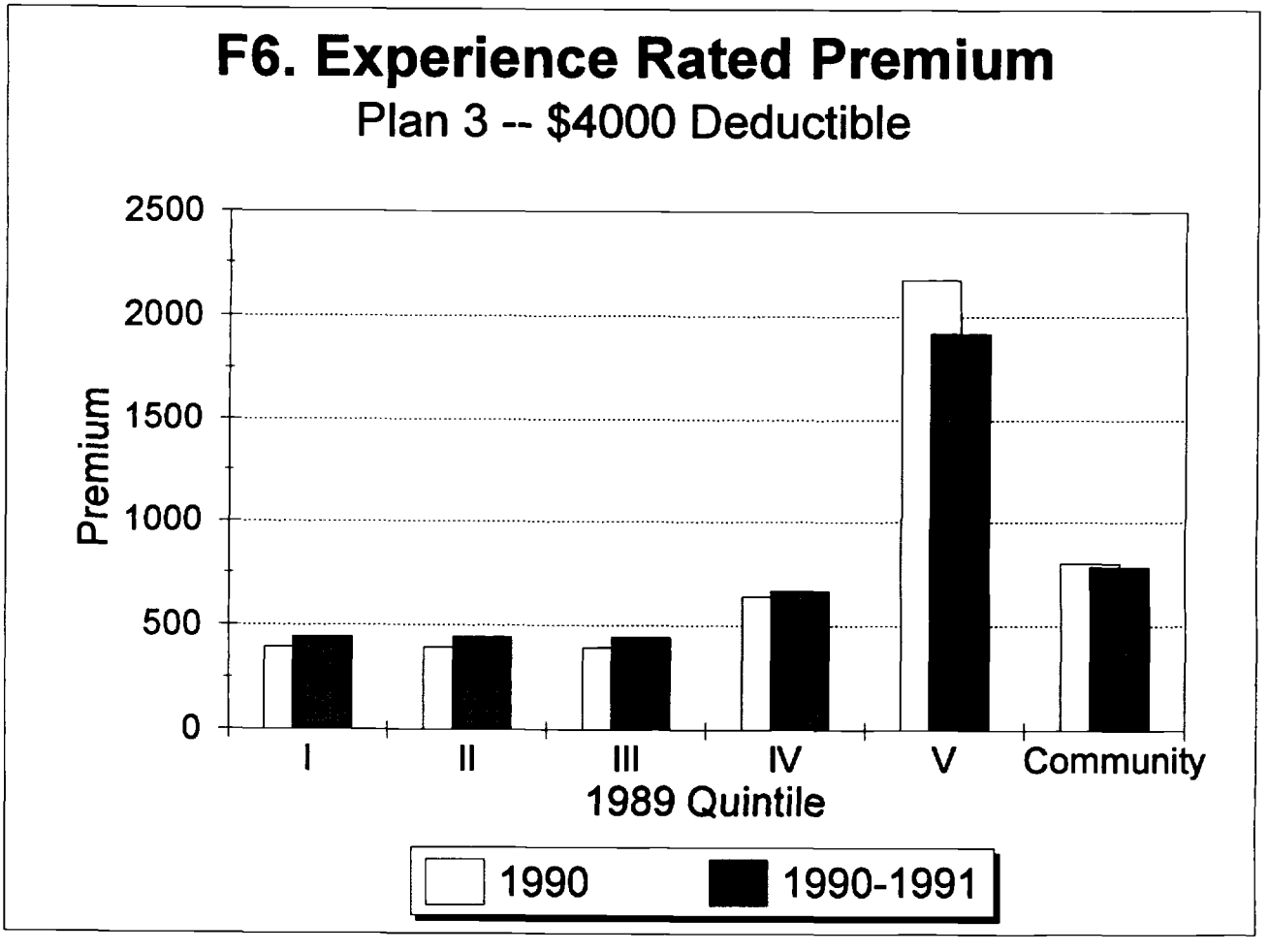


F5a. Experience Rated Premium
Two-Year Annual Cost

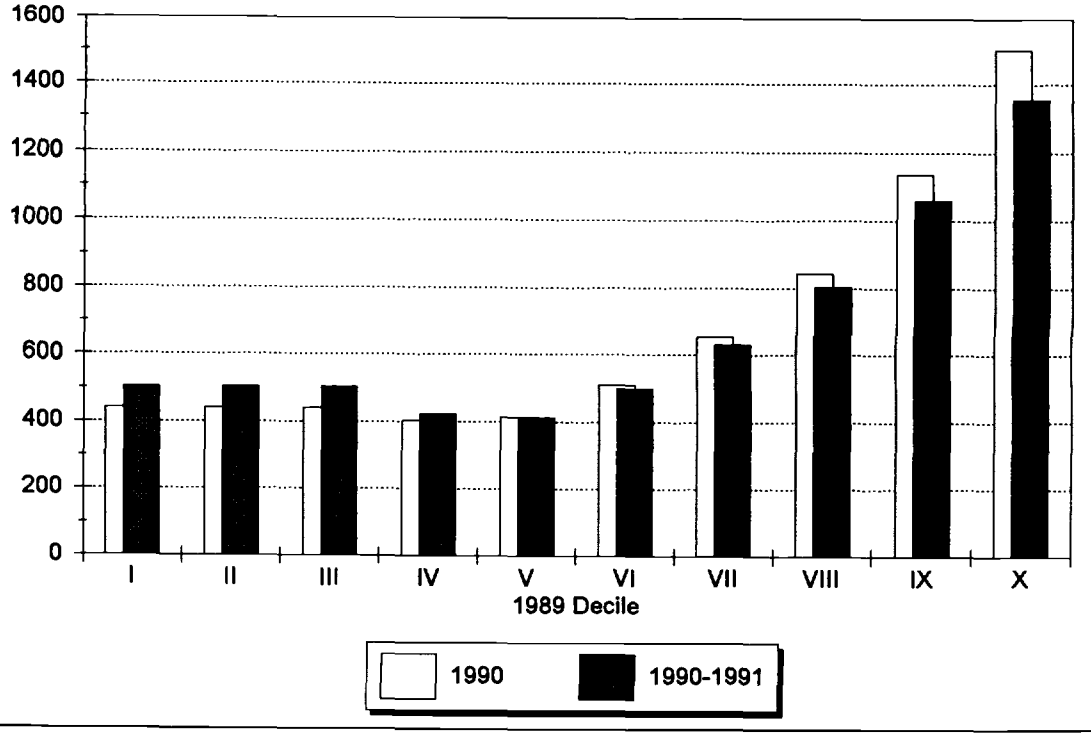


F5b. Experience Rated Premium
Three-Year Average Cost




F6. Experience Rated Premium
Plan 3 -- $4000 Deductible
2500
2000
1500
1000
500
0
Premium
I
II
III
IV
V
Community
1989 Quintile
1990
1990-1991

F7a. Mean Annual Enrollee Cost
Plan 3 -- $4000 Deductible



F7b. Mean Annual Enrollee Cost
Plan 3 -- $4000 Deductible