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A MAJOR RISK APPROACH TO HEALTH INSURANCE REFORM

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EXECUTIVE SUMMARY

This paper examines the implications of a "major-risk" approach to health insurance using data from the National Medical Expenditure Survey. We study the impact of switching from existing coverage to a policy with a 50 percent coinsurance rate and 10 percent of income limit on out-of-pocket expenditures, as well as several alternative combinations of a high-coinsurance rate with a limited out-of-pocket payment. Our analysis is limited to the population under age 65.

Although 80 percent of spending on physicians and hospital care is done by the 20 percent of families who spend over $5,000 in a year, our analysis shows that shifting to a major risk policy could reduce aggre-

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gate health spending by nearly 20 percent. The reductions would be greatest among higher income individuals.

By reducing the excess consumption of health services, the major risk policy increases aggregate economic efficiency. The extent of the increase in efficiency depends on demand elasticities and the extent of risk aversion. With modest values of both demand sensitivity and risk aversion, we find that shifting to a major risk policy would raise aggregate national efficiency by $34 billion a year. Greater demand sensitivity and/or greater risk sensitivity imply even larger gains.

Government provision of a major risk policy to everyone under the age of 65 could be financed with a premium of about $150 per person because of the increased tax revenue and reduced Medicare outlays that would result from the provision of universal major risk insurance for the population under age 65. Even without government provision, individuals might be induced to select major risk policies by changing existing tax rules to eliminate the advantage of insurance, either by including employer provided insurance in taxable income or by permitting a tax deduction for out-of-pocket medical expenditures.

The purpose of insurance is to protect individuals against unexpected expenses. At the same time, the presence of insurance alters the behavior of the insured in ways that increase the expected magnitude of losses. Therefore, designing the optimal insurance policy involves balancing the gains from protection against the losses that result from the distortion of behavior.[1]

The character of actual health insurance in the United States reflects not only the balancing of protection and distortion but also the special incentives created by the tax law. The U.S. tax law permits employers to deduct their payments for health insurance as a cost of business while excluding those premiums from the taxable income of employees. This rule substantially lowers the individual's cost of employer-provided health care through insurance. For an individual with a 30-percent marginal tax rate, a $1 health insurance premium costs only 70 cents of after-tax income. This makes it personally optimal to have much more complete insurance than would otherwise be chosen.[2]

[1] On the general problem of the design of optimal insurance, see Borch (1968), Gould (1969), Mossin (1968), Pashigian, Schkade, and Menefee (1966), and Smith (1968); the theory is reviewed in Laffont (1990). Some of the specific problems of designing health insurance are discussed in Arrow (1964) and Zeckhauser (1970).

[2] Feldstein and Allison (1974) discuss the relation between the tax exclusion and insurance coverage. An explicit calculation of the effect of the exclusion on the individually optimal level of insurance is presented in Feldstein and Friedman (1977). More recent research on

This more complete insurance results in higher spending on medical care and an increased welfare loss from insurance. An individual with a 20-percent coinsurance rate increases health care spending until the last dollar of services brings a benefit that the individual values at only 20 cents. Since the cost of providing that dollar of services is a dollar, there is an 80-cent welfare loss on that last dollar of spending. Because the extent of the distortion in the structure of insurance (i.e., in the coinsurance rate) can be very substantial, the welfare loss that results from the excessive health care spending can also be very large.[3]

In an earlier paper, Feldstein (1971a) suggested that an insurance policy that combined a 50-percent coinsurance rate with a maximum out-of-pocket limit of 10 percent of income would cause most individuals to be more sensitive than under existing insurance to the costs of health care while protecting them against the financial hardship that would result from medical expenses that are a very large share of income. The present paper examines the implications of such a "major risk insurance" approach in the context of today's medical marketplace. More specifically, we use newly available data on health care spending collected by the National Medical Expenditure Survey (Agency for Health Care Policy and Research, 1991) to answer four questions:

(1) Given the existing distribution of health care spending, is it possible to limit total out-of-pocket spending to a moderate percent of income while still having a sizeable fraction of health spending done by individuals who are facing a large coinsurance rate on the margin? Although this seemed plausible in the early 1970s, reliable data were not available to answer the question. Moreover, because health care costs have risen much faster than income since 1970, an out-of-pocket spending limit of 10 percent of income and a 50-percent coinsurance rate might leave too many people at the limit to provide a useful overall incentive to reduce excessive health care spending.

(2) How would a major risk insurance structure with a high coinsurance rate and an income related out-of-pocket maximum affect individuals at different income levels?

(3) What are the explicit welfare effects of shifting from existing insurance coverage to major risk insurance? Substituting a major risk insurance policy would reduce the welfare loss that now results from consuming health care services that are worth less than they cost to produce. But the effect on the risk that individuals bear is ambiguous. The higher

the relation between tax rules and health insurance includes that by Gruber and Poterba (1994a,b).

[3] Feldstein (1973) discusses the welfare cost of excess health insurance.

coinsurance rate would increase the amount of out-of-pocket risk for many individuals. For them, the gain in reduced distortion must be balanced against the loss of increased risk bearing. For some individuals, however, the maximum out-of-pocket limit would lower their risk so that the gain from decreased risk bearing would reinforce the gain from reduced distortion. The extent of these gains and losses depends on the distribution of income and spending and on the parameters of demand and of risk aversion that are discussed below.

(4) Could a publicly provided major risk insurance policy be financed by eliminating the current favorable tax treatment of health insurance premiums paid by employers?

1. THE NATIONAL MEDICAL EXPENDITURE SURVEY DATA

The present analysis utilizes a remarkable body of data collected by the Agency for Health Care Policy and Research in 1987. The National Medical Expenditure Survey (NMES) began with a population sample in which individuals were asked about their consumption of health services, and about the identity of their employers and insurance companies (if they purchased insurance on their own). Employers and insurers were then asked for details on the individual's insurance plan. Interviews with providers were used to obtain detailed information on the utilization of insured health services to supplement the information reported by the individuals themselves.[4]

In order to have a distribution of health spending that represents what a well-insured family or individual would spend, we have restricted attention to families in which all members are covered by a private group insurance policy. Our sample is also restricted by eliminating any insurance unit with someone who is over 65 years old (since they would be covered by the federal government's Medicare program). The final sample contains approximately 63% of families with no member over age 65.

The resulting sample has 6,000 insurance units, either individuals or families.[5] We use the NMES weights on these observations to reweight

[4] For some categories of spending, such as hospital services, spending from each event reported by the individuals was corroborated with the provider. For other categories, such as physician visits, only a subsample of spending events was corroborated, and the resulting evidence was used to adjust reported spending for the remaining events.

[5] An insurance unit can be an individual or a Census family or any subgroup that has separate insurance coverage. For example, an adult child living at home would be part of the Census family but would generally be a separate insurance group.

our sample by income and demographic group to obtain national totals with the correct income and demographic mix.[6] Since the data were collected for 1987, we adjust the individual amounts of income and health care spending to projected 1995 levels. Income is adjusted from 1987 to 1995 by a factor of 1.583, reflecting the increase in nominal per capita income. Health care spending is adjusted by the growth rate in per capita personal health expenditure on doctors and hospitals as projected to 1995 by the Congressional Budget Office (Congressional Budget Office, 1993).

The weighted mean level of spending in this well-insured group of under-65-year-olds at 1995 levels was $3,985.[7] The distribution of spending is very skewed. While 39 percent of insurance units spend less than $500, their spending constitutes only 1.5 percent of total spending. In contrast, only one-sixth of insurance units spend more than $5,000, but their spending constitutes almost 80 percent of total spending. Table 1 presents the distribution of spending, indicating the fraction of insurance units with spending below that limit and the fraction of total health care dollars spent below that limit.

The existing private group insurance policies require insurance units to pay deductibles and coinsurance payments that together represent an average of 39 percent of gross spending on doctors and hospitals. This number is surprisingly high, given the well-insured group which we observe.[8]

Table 2 shows the distribution of this out-of-pocket spending. The distribution is even more skewed than the total spending distribution, with the top 4 percent of spenders accounting for almost 40 percent of out-of-pocket spending. The fact that 83 percent of the sample has out-of-pocket spending below $1,000 in a year under their existing health insurance plans suggests that there is some scope for demand reduction under an MRI-type plan.

[6] Such a reweighting is important because, for example, our average unweighted sample member is richer than the average population member. We cannot adjust, however, for the possibility of self-selection in either insurance status or in the characteristics of the individual's insurance plan.

[7] We use the term *health care spending* as a shorthand for the spending on physicians and hospitals. We exclude other categories of spending because they may not be covered by these individuals' private insurance plans.

[8] Of course, the marginal copayment rate on the last dollar of spending will be somewhat below this average copayment rate, which confounds the effects of deductibles, copayment rates, and out-of-pocket maxima. To the extent that the marginal copayment rate in the individual's original insurance plan is lower, it will strengthen the expenditure reducing effects of our MRI plan.

TABLE 1.
Distribution of Health Care Spending

Spending group	Mean spending	Percent of insurance units		Percent of total spending	
		pdf	*cdf*	*pdf*	*cdf*
Under 500	151	38.9	38.9	1.5	1.5
500–1,000	728	13.4	52.3	2.4	3.9
1,000–1,500	1,235	8.5	60.8	2.6	6.5
1,500–2,000	1,718	5.1	65.9	2.2	8.7
2,000–2,500	2,242	3.5	69.4	2.0	10.7
2,500–3,000	2,738	3.5	72.9	2.4	13.1
3,000–3,500	3,246	2.7	75.6	2.2	15.3
3,500–4,000	3,705	1.8	77.4	1.7	17.0
4,000–4,500	4,249	1.8	79.2	1.9	18.9
4,500–5,000	4,764	1.5	80.7	1.8	20.7
5,000–6,000	5,489	2.7	83.4	3.8	24.5
6,000–7,000	6,439	2.3	85.7	3.7	28.2
7,000–8,000	7,498	1.7	87.4	3.2	31.4
8,000–9,000	8,495	1.8	89.2	3.8	35.2
9,000–10,000	9,495	1.1	90.3	2.6	37.8
10,000–15,000	12,139	4.1	94.4	12.4	50.2
15,000–20,000	17,414	1.8	96.2	7.7	57.9
20,000–25,000	22,569	1.1	97.3	5.6	63.5
Over 25,000	52,804	2.7	100.0	36.1	100.0
Total	3,985	82.5 million		329 billion	

Note: Estimates refer to total spending on physician and hospital services in 1995 by the population under age 65. See text for further description.

2. WOULD A MAJOR RISK INSURANCE POLICY REDUCE EXCESSIVE SPENDING?

The very skewed distribution of health care spending raises the question of whether a limit of 10 percent on the out-of-pocket health spending would leave many dollars of health spending exposed to a substantial copayment rate. For example, a major risk insurance policy with a 50-percent copayment rate and an out-of-pocket limit of 10 percent of income would cause a family with $35,000 of income to be sensitive on spending below $7,000 but then to have a zero marginal price for health spending above $7,000. The distribution in Table 1 shows that 68 percent of spending is incurred by insurance units that spend more than $7,000.

More generally, the combination of a 50-percent coinsurance rate and a 10-percent maximum out-of-pocket limit implies that individuals are

TABLE 2.
Distribution of Out-of-Pocket Health Care Spending

Spending group	Mean spending	Percent of insurance units		Percent of total spending	
		pdf	*cdf*	*pdf*	*cdf*
0	0	20.43	20.43	0	0
1–50	26	6.13	26.56	0.21	0.21
50–100	73	8.47	35.03	0.83	1.04
100–250	169	16.70	51.73	3.77	4.81
250–500	362	15.58	67.31	7.55	12.36
500–750	612	8.36	75.67	6.85	19.21
750–1,000	863	6.89	82.56	7.96	27.17
1,000–1,500	1,209	6.81	89.37	11.02	38.19
1,500–2,000	1,736	3.15	92.52	7.33	45.52
2,000–2,500	2,216	2.09	94.61	6.21	51.73
2,500–3,000	2,757	1.40	96.01	5.18	56.91
3,000–3,500	3,237	0.92	96.93	3.99	60.90
3,500–5,000	4,117	1.33	98.26	7.35	68.25
over 5,000	13,727	1.73	100.00	31.73	100.00
Total	747	82.5 million	62 billion		

Note: Estimates refer to out-of-pocket spending on physician and hospital services in 1995 by the population under age 65. See text for further description.

sensitive if their health spending is less than 20 percent of their income and insensitive if their spending is above that amount. The NMES data imply that only 11 percent of nonaged insurance units spend 20 percent or more of their income on health care but that 64 percent of total spending is spent by that 11 percent. A major risk insurance policy with a 50-percent coinsurance rate and a 10-percent of income maximum out-of-pocket amount can therefore reduce excessive spending by shrinking the spending of the 89 percent of insurance units who collectively spend 36 percent of the total health dollars.

An alternative major risk insurance policy that combines a 50-percent coinsurance rate with a 15-percent of income maximum out-of-pocket limit implies that individuals would be sensitive on incremental spending if they spend less than 30 percent of their income on health care. According to the NMES data, such a major risk insurance policy would be able to shrink the spending of 92 percent of insurance units who spend 45 percent of total health spending.

The effect on health care spending of raising coinsurance rates from current levels to 50 percent depends on the price elasticity of demand for health care. Because there is considerable uncertainty surrounding the value of this elasticity, the analysis in this paper examines the implications of elasticities of 0.33 and 0.50. We believe that these values are likely to be relatively modest as estimates of the long-run response of the health care system to changes in coinsurance rates.[9]

Our analysis assumes that spending in excess of 10 percent of income reverts to the spending under the current insurance coverage. Almost all people with private group insurance are already at a zero coinsurance rate when their gross medical spending reaches 20 percent of income, the level at which the 10-percent maximum out-of-pocket limit in the alternative major risk insurance policy reduces the coinsurance rate to zero. Even though the cash price is then zero, utilization is limited by a combination of provider decisions and patient concerns about the risk, discomfort, and time loss associated with increased utilization of care.[10]

Table 3 shows the effect of alternative major risk insurance policies on health care spending, with that spending decomposed to show the amount paid out-of-pocket and by the insurance company. The first line of the table shows the spending under the existing group insurance coverage as reported in the NMES data.[11] The average spending per insurance unit is $3,985 (at 1995 price levels). Of this, the average out-of-pocket spending is $747, and the remaining $3,238 is paid by the insur-

[9] The RAND national health insurance experiment (Manning et al., 1987; Newhouse, 1993) estimated an elasticity of health care spending with respect to the net-of-insurance cost per dollar of care of only 0.2. We believe that the RAND procedure of giving different insurance coverage to a random sample of individuals is likely to underestimate the effect on utilization of a community-wide change in coinsurance rates. Changing the policy of isolated individuals, as the Rand experiment did, may change the willingness of patients to visit a physician but will not alter the character of the care given prescribed by physicians or the sophistication of the services provided by hospitals. Earlier (nonexperimental) literature on the price elasticity of demand for health care is reviewed by Phelps (1992). Estimates of the elasticity of demand for hospital care range from −0.47 (Davis and Russell, 1972) to −0.67 (Feldstein, 1971b), and for doctor care from −0.14 (Phelps and Newhouse, 1972) to −1 (for hospital outpatient visits—Davis and Russell, 1972).

[10] This assumption is subject to two offsetting biases. First, we understate the potential gain from the major risk insurance policy by assuming (in effect) that there is only one "draw" from the distribution of medical spending per year. A more realistic picture for spending is one of a series of smaller spending decisions throughout the year. In this case, spending on the "early" events will be reduced by the 50-percent coinsurance rate under the MRI plan, even if that family eventually exceeds the maximum out-of-pocket amount. On the other hand, for some low-income individuals, the maximum out-of-pocket amount may be below the maximum that the family faced under their ex ante insurance plans. For those persons, we do not account for the fact that we are lowering their price to zero above 20 percent of their income, so that we overstate the gains from a major risk policy.

[11] Recall that we are analyzing only those nonaged individuals and families in the NMES data that have group insurance and that this subsample of the population is then reweighted to correspond to the national nonaged population. Estimates are presented for national aggregate spending and for spending per "insurance unit." The insurance units are the actual individuals and families that are separately insured in the NMES sample.

TABLE 3.
Expenditure Effects of Alternative Major Risk Insurance Plans

		Average			Aggregate (billions)		
	Elasticity	*Out-of-pocket expenditures*	*Insurance*	*Total*	*Out-of-pocket expenditures*	*Insurance*	*Total*
Original		747	3,238	3,985	61.6	267.2	328.7
Plan 50–10	0	1,127	2,857	3,985	93.0	235.7	328.7
	0.33	873	2,385	3,257	72.0	196.7	268.7
	0.5	768	1,990	2,758	63.3	164.2	227.5
Plan 50–15	0	1,292	2,693	3,985	106.6	222.2	328.7
	0.33	959	2,094	3,052	79.1	172.7	251.8
	0.5	828	1,731	2,559	68.3	142.8	211.1
Plan 100–15	0	2,011	1,974	3,985	165.9	162.8	328.7
	0.33	1,367	1,665	3,032	112.8	137.3	250.1
	0.5	1,100	1,256	2,356	90.8	103.6	194.4

Note: All figures in 1995 dollars. "Average" columns refer to calculations per insurance unit; "Aggregate" columns refer to calculations for the nation as a whole, and they are in billions of dollars. See text for further details.

ers.[12] These amounts per insurance unit correspond to an aggregate spending on physician and hospital services by the nonaged population of $329 billion.

The next three lines show the effect of the basic 50–10 major risk insurance plan that has a 50-percent coinsurance rate on all spending until out-of-pocket spending reaches 10 percent of income. With a zero price elasticity, the only effect of the major risk policy is to shift the burden of the cost from the insurance company to the individuals. Aggregate out-of-pocket payments rise by 51 percent from $61.1 billion to $93.0 billion, but there is no change in the $328.7 billion total cost of care.

With a price elasticity of 0.33, aggregate total spending falls by $60 billion to $268.7 billion, a decline of 18 percent. It is striking that even though the higher coinsurance rate applies to only 36 percent of spending and the elasticity is a modest 0.33, the major risk policy reduces total spending by $60 billion a year or 18 percent of the aggregate baseline spending. Because total spending is reduced, out-of-pocket spending is only 17 percent higher, rising from $747 per insurance unit under the existing policy to $873 per insurance unit under the major risk policy.

12 It is interesting to note that, despite that fact that the average coinsurance rate under existing private insurance plans in our sample is almost 40 percent, the average out-of-pocket amount is less than 20 percent of the average total spending. This reflects the fact that the distribution of out-of-pocket spending is even more skewed than the distribution of total spending.

A long-run price elasticity of 0.50 implies that, in the long run, a major risk policy would reduce total spending by 31 percent or $101 billion a year. With this elasticity, there is essentially no increase in out-of-pocket spending. The decline in the total spending almost exactly balances the increased share paid out of pocket, causing the out-of-pocket amount per insured to rise from $747 to only $768. The amount paid by the insurers and, therefore, the insurance premium declines by $1,248 per insurance unit or 39 percent.

Thus, even with the very skewed distribution of health spending that we now observe, the major risk structure of a high coinsurance rate and a 10 percent of income limit on out-of-pocket spending can reduce total spending very substantially and leave average out-of-pocket spending unchanged, if the demand elasticity is as high as 0.5.[13]

The next three lines of Table 3 show the effect of increasing the maximum out-of-pocket amount to 15 percent of income while keeping the coinsurance rate at 50 percent. Since this 50-percent increase in the maximum out-of-pocket limit only increases the number of cost-sensitive insurance units from 89 percent of all units to 92 percent and only increases the fraction of spending that is cost-sensitive from 36 percent to 45 percent, the effect on total spending is relatively small. With a price elasticity of 0.5, aggregate total spending is $211 billion or $16 billion less than with a 10 percent of income out-of-pocket limit. Average out-of-pocket spending rises to $828.

One final alternative worth considering is a deductible plan. The last three lines refer to a plan with a deductible (i.e., a 100-percent coinsurance rate) equal to 15 percent of family income. The insured are subject to the same maximum risk as under the 50–15 plan but are sensitive over a much smaller range of costs (up to 15 percent of income instead of 30 percent). Although the sensitivity range is smaller, the 100-percent coinsurance rate makes the individuals more responsive within this range. This greater sensitivity does outweigh the narrower range of sensitivity, causing total spending to be nearly $17 billion lower under the 100–15 plan than under the 50–15 plan. Although this total cost saving is achieved without exposing individuals to a higher maximum out-of-pocket spending than under the 50–15 plan, the use of the deductible rather than the 50-percent coinsurance rate increases the average out-

[13] Such a program would also affect the incentive to earn and report income, since higher income implies a higher copayment rate under the MRI plan. For the average person, however, the disincentive is likely to be small; as shown in Table 4, average out-of-pocket expenditures do not rise very steeply with income. This disincentive is largest for the person who will exceed his or her out-of-pocket maximum with certainty; under our 50–10 plan, this would imply a 10-percent marginal tax rate on additional income.

TABLE 4.

Effects of the 50–10 Major Risk Insurance Plan by Income Category

		Average			Aggregate (billions)		
	Elasticity	*Out-of-pocket expenditures*	*Insurance*	*Total*	*Out-of-pocket expenditures*	*Insurance*	*Total*
Below poverty							
Original plan		1,304	4,089	5,392	10.8	33.7	44.5
Plan 50–10	0	421	4,971	5,392	3.5	41.0	44.5
	.33	389	4,905	5,294	3.2	40.5	43.7
	.5	370	4,624	4,995	3.1	38.2	41.2
Between poverty and twice poverty							
Original plan		610	3,469	4,079	9.2	52.1	61.3
Plan 50–10	0	908	3,171	4,079	13.6	47.7	61.3
	.33	768	2,798	3,567	11.5	42.1	53.6
	.5	692	2,321	3,013	10.4	34.9	45.3
Between twice poverty and $75,000							
Original plan		647	2,773	3,421	28.3	121.1	149.5
plan 50–10	0	1,078	2,342	3,421	47.1	102.4	149.5
	.33	844	1,883	2,726	36.9	82.3	119.2
	.5	743	1,540	2,283	32.5	67.3	99.8
Above $75,000							
Original plan		863	3,872	4,735	13.4	60.1	73.5
Plan 50–10	0	1,854	2,881	4,735	28.8	44.7	73.5
	.33	1,312	2,058	3,371	20.4	31.9	52.3
	.5	1,122	1,538	2,659	17.4	23.9	41.3

Note: All figures in 1995 dollars. "Average" columns refer to calculations per insurance unit; "Aggregate" columns refer to calculations for the nation as a whole, and they are in billions of dollars. Each block of the table refers to the effect on insurance units in that income bracket.

of-pocket spending from $828 per insurance unit to $1,100 per insurance unit. This is because the deductible plan increases the out-of-pocket spending in the more likely part of the spending distribution.

Before presenting an explicit welfare analysis that combines the effects of the reduced distortion (i.e., the lower total spending) and the changes in individual risk bearing, we look briefly at the way that the major risk policies affect individuals at different income levels.

3. HOW DOES MAJOR RISK INSURANCE AFFECT DIFFERENT INCOME GROUPS?

Because the maximum out-of-pocket payment is limited to 10 percent of income, the major risk policy pays substantially more for lower-income individuals and families than it does for higher-income groups. In comparison with the existing structure of insurance, the result is a substantial redistribution in favor of lower-income groups. This redistribution is in addition to any redistribution that occurs in extending coverage to those low-income individuals who are currently uninsured.

Table 4 divides the population into four different income groups and shows for each group the patterns of spending under the existing insurance coverage and under the 50–10 major risk plan. Before one examines the effects of the major risk insurance, it is worth noting that the average level of spending under the initial insurance coverage differs substantially among the four income groups. The group of individuals below poverty has by far the highest initial level of spending per insurance unit. This may be a reflection of the way that these data are constructed rather than an accurate picture of the spending of below-poverty groups in the population as a whole. The data presented here are based on the rather unlikely combination of being below poverty but still insured by a private group policy. One way that individuals might find themselves in such a situation is by becoming very ill while working for a firm that provides group insurance, causing them to leave their jobs, but retain their health insurance.[14] This distortion of the baseline spending pattern changes the specific numerical values presented in the current section but does not alter the basic conclusion that major risk policies are particularly favorable to lower-income individuals.[15]

14 Federal legislation under the Consolidated Omnibus Reconciliation Act of 1986 (COBRA) mandated that individuals who left jobs where they were covered by health insurance plans could continue to purchase that insurance at the average group rate. Huth (1991) and Long and Marquis (1992) find that such continuation coverage is in fact taken up by the sickest job leavers.

15 As a check on the results in this section, we have prepared estimates of the distributional effect of the income-related out-of-pocket maximum for a "synthetic" population that is

Two features stand out in Table 4. First, the average out-of-pocket spending under the major risk plan rises very sharply as income rises, reflecting the fact that the maximum out-of-pocket spending rises in proportion to income. With no behavioral response, the average out-of-pocket spending rises from $421 in the below-poverty group to $908 in the group between poverty and twice poverty and eventually to $1,854 in the highest income group. In the lowest income group, the average out-of-pocket spending under the major risk plan is less than one-third of the baseline level under the ex ante insurance policy, while in the highest income group the average spending under the major risk plan is more than twice the baseline level.

Although the behavioral response to higher coinsurance diminishes the strength of this effect, it remains true even with a price elasticity of 0.5. Out-of-pocket spending goes from less than one-third of the baseline level in the below-poverty group to 30 percent above the baseline level in the highest income group.

The second noticeable feature is that the major risk plan reduces the total consumption of health care much more for high-income individuals than for lower-income individuals. This reflects the fact that the higher coinsurance rate applies to an increasing share of spending as income rises. With a price elasticity of 0.5, the lowest income group sees total aggregate health spending decline by only 7.4 percent (from $44.5 billion to $41.2 billion). Among those with incomes between poverty and twice poverty, health spending declines by 26 percent, and in the highest income group, it declines by 44 percent. Thus, the MRI plan reduces total spending in a way that favors lower-income individuals or families.

4. THE WELFARE ECONOMICS OF MAJOR RISK INSURANCE[16]

Substituting a major risk policy for existing health insurance has two effects on individual welfare. It reduces the deadweight loss that results

assumed to have the same random distribution of spending for each demographic group regardless of income, thus purging the data of the problematic correlation between spending and income documented in Table 3. The method of doing this analysis and the results are presented in the Appendix to this paper. Those results confirm the general characteristics described in this section of the paper.

[16] This section follows the approach developed in Feldstein (1973). A major difference is that the current paper uses the actual distribution of gross spending, while Feldstein (1973) used very aggregate data to estimate the probability of hospital admission and the parameters of a gamma distribution that was taken to represent the conditional distribution of spending. In order to make the analysis tractable with the resulting mixed poisson-gamma distribution process, the utility function had to be assumed to be one of constant absolute risk aversion.

from the excessive consumption of health care services induced by the very low marginal cost of care under existing insurance policies. It also alters the risk distribution that the individual faces, increasing the risk of modest spending but limiting the maximum risk. The reduction in the deadweight loss is an unambiguous benefit, while the sign of the welfare effect of the change in the risk distribution is ex ante ambiguous, depending on the distribution of health care spending and on the individual's utility function.[17]

We simplify the welfare calculations by assuming that the two welfare effects can be evaluated separately and added together. We also convert the welfare changes into equivalent income variations and then aggregate by adding those equivalent income variation measures over all insurance units in the population.

4.1 The Reduced Distortion of Health Care Spending

Figure 1 shows our approach to measuring the individual gain from reduced distortion. We measure the unit of health care so that its price in the absence of insurance is 1.[18] The existing insurance policy has a coinsurance rate of P_0, which is the net of insurance price to the consumer. Conditional on the individual's medical condition, the individual consumes E_0 units of care. The deadweight loss caused by the induced increase in health spending is given by the area of the triangle ACD.

The major risk policy raises the coinsurance rate for that individual to P_1 (if the resulting out-of-pocket cost is below the maximum out-of-pocket amount) and reduces the consumption of health care to E_1. This reduces the deadweight loss by the shaded area BCDE, which is equal to $(E_0 - E_1)*(1 - P_1) + 0.5*(P_1 - P_0)*(E_0 - E_1)$.

The reduction in the deadweight loss implied by the simple analysis of Figure 1 varies from individual to individual, depending on the individual's medical condition and, therefore, on the initial level of health care spending, E_0. For each individual, the reduction in the deadweight loss is readily calculated for any major risk coinsurance rate (P_1) on the basis of the available data (E_0 and P_0 as reported in the NMES survey) and the assumed price elasticity of demand since $E_1 = E_0 (P_0/P_1)^{\epsilon}$ where ϵ is the

[17] Even in a world where most households have reached the point of zero copay under their old plans by the time that they hit their MRI out-of-pocket maximum (as assumed earlier), MRI can still lower their risk because it reduces the amount of spending below the max. Consider the example of the person with $20,000 of income and a $2,500 deductible. This person will be sensitive to medical spending for a greater range under the MRI plan (up to $4,000) but will face a lower out-of-pocket risk (the maximum MRI expenditure being $2,000).

[18] Our analysis assumes that health care services are supplied at constant cost so that no change in producers' surplus need be taken into account.

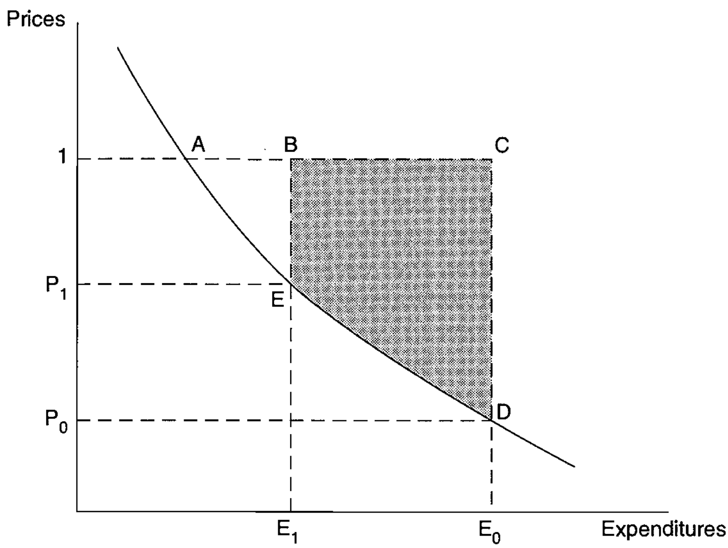

FIGURE 1: ***The Deadweight Loss of Excess Insurance***

absolute value of the price elasticity. As noted earlier, if the individual's spending is over the maximum out-of-pocket level, our analysis assumes that the major risk insurance policy has no effect on utilization and, therefore, no effect on the deadweight loss.[19]

Even at our highest elasticity assumptions, there is a further reason why our calculation may understate the gain from reduced spending in the long run. The initial level of spending may exceed what consumers would really want even at the initial price because the physicians who make the detailed health care choices, instead of acting as the agents of their patients, prescribe additional care. Such excessive care could arise because of a concern about medical malpractice, physician preferences for practicing a technically more sophisticated style of medical care, or because it is in the physician's own financial interest to prescribe more extensive care. With increased patient cost sharing, patient sensitivity to the increased costs of care arising from such physician behavior may counteract these supply side tendencies.

[19] Once again, our analysis may understate the potential gain from the major risk insurance policy by assuming that there is only one "draw" from the distribution of medical spending per year. A more realistic picture in which spending for the year is the result of a series of spending decisions creates the possibility that total spending will be reduced even though the individual eventually spends enough to exceed the maximum out-of-pocket limit since the "early" spending decisions in the year were influenced by the high coinsurance rate.

4.2 The Change in Risk Bearing

To calculate the effect of the change in the individual's risk bearing, we ask, for each insurance unit in our sample, what that unit would have to be paid to assume the additional risk implied by the increased coinsurance rate (or would pay if the risk-limiting effect of the maximum out-of-pocket limit outweighs the increased risk of the higher coinsurance rate). We then aggregate these amounts over the population as a whole.

More formally, we assume that each individual has utility that is a function of net nonhealth consumption, defined as the difference between that individual's income (Y^i) and the random out-of-pocket expenditure X_0^i: that is, $U(Y^i - X_0^i)$. Thus, the expected utility of the individual is $\mathbf{E}\{U(Y^i - X_0^i)\}$ where the expectation is over the different possible values of X_0^i. The uncertain distribution of out-of-pocket payments can be summarized by the certainty equivalent C_0^i, a fixed amount such that $U(Y^i - C_0^i)\}. = \mathbf{E}\{U(Y^i - X_0^i)\}$.

The shift to the major risk policy replaces each individual's out-of-pocket distribution X_0^i with a new out-of-pocket distribution X_1^i. Since the difference between the mean values of X_0^i and X_1^i is simply a transfer between the insured and the insurer, we calculate the certainty equivalence of the new out-of-pocket risk distribution with an adjustment ($\mu_1^i - \mu_0^i$) to make the mean of the new risk distribution equal to the mean value of the initial distribution (i.e., we evaluate the mean preserving spread in risk). Thus, we define the certainty equivalence payment C_1^i as: $\mathbf{E}\{U(Y^i - X_1^i + \mu_1^i - \mu_0^i)\} = U(Y^i - C_1^i)$.

The difference between the two certainty equivalence values, $C_1^i - C_0^i$, measures the change in the value that the individual attributes to risk bearing. We add these certainty equivalence differences over individuals just as we added the value of the reduced distortion.

To make this approach operational, we need to specify a particular utility function and a method of calculating expected utility. Our analysis uses the constant relative risk aversion utility function $U(Z) = -(1/\rho)\, Z^{-\rho}$, which implies that the relative risk aversion is $-U''/Z\,U' = \rho + 1$. A special case of this, the logarithmic utility function $U(Z) = \ln Z$, corresponds to $\rho = 0$. For our numerical calculations, we examine two values of risk aversion: the logarithmic case with constant relative risk aversion of 1 and the more risk averse case with constant relative risk aversion of 3 ($\rho = 2$). These values essentially contain the range of estimated coefficients of relative risk aversion in the macroeconomics literature (Zeldes, 1989).

To calculate expected values, we first create distributions of spending under the existing insurance for each of four demographic types of insurance units in our NMES data: single adults, single adults with children, couples, and couples with children. To create each distribution, we rank all of the observations of that demographic type, divide the rank list into 100 equal intervals, and assign a probability of 0.01 to each interval. To calculate the expected utility for each individual under the initial insurance, $E\ U\ \{Y - X_0\}$, we draw 50 observations from the relevant demographic distribution and calculate the average utility for that insurance unit (given its income). In this way we combine the (reweighted) income distribution of the NMES data and the demographic-specific cumulative frequency distributions of spending.[20] To calculate expected utility for any major risk insurance plan, we repeat the same process with the additional step of transforming the out-of-pocket spending from the initial level to the level corresponding to the major risk coinsurance rate and elasticity of demand.

4.3 Results

The results of the analysis are presented in Table 5 for the three major risk plans and demand elasticity values that we considered in Table 3 and for the two different measures of constant relative risk aversion. Consider first the welfare gain from reducing the insurance-induced distortion of demand. The first row of the table is based on the 50–10 major risk plan with a zero price elasticity of demand and a constant relative risk aversion of 1. Since the zero price elasticity implies that shifting from existing insurance to the major risk plan involves no change in behavior, there is no welfare gain from reduced distortion. With a demand elasticity of 0.33, shown in the next row, there is a reduced distortion. The reduced deadweight loss is equal to $534 per insurance unit, approximately 13 percent of the initial spending level and 73 percent of the reduced spending shown in Table 3. A demand elasticity of 0.5 increases the value of the reduced distortion to $902 per insurance unit.

The major risk plan with a 50-percent coinsurance rate but a wider range of sensitivity corresponding to a maximum out-of-pocket limit of 15 percent of income causes slightly greater reductions in distortion. With an elasticity of 0.5, the value of the reduced distortion is $1,045 per insurance unit (instead of the $902 reported for the 50–10 policy.)

[20] Our method assumes that the distribution of spending within each demographic group is independent of the level of income. An alternative procedure of grouping individuals by broad income group as well as demographic group would allow us to relax this assumption, but, by giving us a smaller sample for each group, would make the resulting distribution less reliable. Because of the importance to our analysis of the relatively infrequent large expenditures, we have chosen to use the larger samples to calculate the cumulative distributions for each demographic group rather than recognizing the possible relation between income and spending.

TABLE 5.
Welfare Economics of Alternative Plans

Plan	Elasticity	Per Family: *Reduced distortion*	Per Family: *Increased risk*	Per Family: *Net gain or loss*	Aggregate net gain or loss (billions)
CRRA 1					
50–10	0	0	317	−317	−26.2
	.33	534	118	416	34.3
	.5	902	42	860	71.0
50–15	0	0	534	−534	−44.1
	.33	683	288	395	32.6
	.5	1,045	201	844	69.6
100–15	0	0	1,306	−1,306	−107.7
	.33	426	973	−547	−45.1
	.5	735	504	230	19.0
CRRA 3					
50–10	0	0	−154	154	12.7
	.33	534	−362	896	73.9
	.5	902	−442	1,344	110.9
50–15	0	0	105	−105	−8.7
	.33	683	−158	841	69.4
	.5	1,045	−252	1,297	107.0
100–15	0	0	923	−923	−76.1
	.33	426	570	−144	−11.9
	.5	735	72	663	54.7

Note: All figures in 1995 dollars. CRRA is the level of constant relative risk aversion. Reduced distortion is the reduction in deadweight loss from reduced spending; increased risk is the (potential) increase in the certainty equivalent of the higher risk that individuals bear under the plan. Negative numbers indicate reduced risk in risk column, and a net welfare loss in the net gain or loss column. See text for additional details.

Replacing the 50-percent coinsurance rate with a deductible equal to 15 percent of income (the 100–15 plan) causes lower average levels of spending (as indicated in Table 3) but reduces the average deadweight loss of distortion by less. For example, with an elasticity of 0.5 the 50–15 plan reduces average spending relative to the initial level by $1,426, while the 100–15 plan reduces average spending $1,629. In contrast, the value of the reduced distortion associated with the 50–15 plan is $1,045, while the value of the reduced distortion associated with the 100–15 plan is only $735. The reason that the deductible reduces spending by more but the deadweight loss by less is that deductibles reduce spending within a smaller range. Since some of the spending in that range was valued by the consumer, the reduced DWL per dollar of reduced spending is smaller. That is, it is more efficient to maintain a high price on the marginal dollar of spending than to cut spending deeply over a small range, with a price of zero above that range.

To assess the overall welfare effect of shifting from existing insurance to a major risk plan, these reductions in deadweight loss must be combined with assessments of the change in risk. Consider first the case of the 50–10 major risk plan with logarithmic utility function (CRRA = 1). If the demand elasticity is zero (the first row of Table 5), each individual faces the increased risk associated with a higher coinsurance rate up to the maximum out-of-pocket limit but then may have less risk than under the existing ordinary insurance plan. On average, individuals would be indifferent between the new and riskier distribution and the initial distribution plus a certainty equivalent charge of $317. The net welfare effect of the major risk insurance plan when individuals have a zero demand elasticity, therefore, is an average loss of $317 per insurance unit.

The next row of Table 5 shows that the result is quite different when the individuals have a demand elasticity of 0.33. The reduced distortion of $534 outweighs the increased risk valued at $317, producing a net gain of $217 per insurance unit. This understates the true net welfare gain associated with the elasticity of 0.33 because the behavioral response reduces the amount of out-of-pocket risk relative to what it would be with no behavioral response (as well as reducing the distortion in total spending.) Although the net out-of-pocket risk remains greater with the 50–10 plan than with the existing plan, the combination of the greater coinsurance rate and the reduction in total spending implies that the increased risk has a certainty equivalent change of only $118. This is shown in the second column of Table 5. Subtracting the value of the increased risk from the value of the reduced distortion leaves a net gain of $416 per insurance unit. Since there are 82.5 million insurance units, this implies an aggregate welfare gain of $34.3 billion (shown in the last column of Table 5).

An elasticity of 0.5 implies not only a greater reduction in distortion ($902 per insurance unit) but also a much smaller increase in risk ($42 per insurance unit), implying a net gain from shifting to the 50–10 major risk policy of $860 per insurance unit and an aggregate net gain of $71.0 billion.

Although extending the sensitivity range by increasing the maximum out-of-pocket amount to 15 percent of income (the 50–15 major risk plan) reduces distortion by more than the 50–10 plan, the gain from this source is not enough to outweigh the increased risk bearing when the demand elasticity is 0.5 or less. With an elasticity of 0.5, the reduced distortion is $1,045, and the increased risk bearing is $201, implying a net gain of $844, slightly below the $860 net gain of the 50–10 plan. Comparing the two plans shows that the gap decreases as the demand elasticity increases, from a gap of $217 with no behavioral response to $21 when the demand elasticity is 0.33 and $16 when the demand elasticity is 0.5. The 50–15 plan only produces a greater benefit when the demand elasticity exceeds 0.65.

Substituting a deductible for the 50-percent coinsurance rate is clearly inferior. Not only is the reduced distortion less for each demand elasticity, as noted above, but the value of the increased risk is also greater.

The lower half of the table considers the welfare effects if individuals are substantially more risk averse (a constant relative risk aversion of $\rho + 1 = 3$.) The striking difference between the logarithmic utility function and this case is that there is actually *reduced* risk bearing in the cases of 0.33 and 0.5 elasticity, with both the 50–10 and 50–15 plans. That is, in these cases, the reduced risk associated with the maximum out-of-pocket limit now outweighs the increased risk below that limit.

In fact, even with no behavioral response, the increased protection afforded by the 10 percent of income limit on out-of-pocket expenses outweighs the shift to the 50-percent coinsurance rate under the 50–10 plan and produces a net gain of $154 per insurance unit. With a zero price elasticity, individuals would on average be indifferent between the out-of-pocket risk distribution of the 50–10 major risk policy and the combination of the current insurance policy and paying a fixed lump sum of $154.

An increase in the price elasticity of demand shrinks the amount of risk with the 50–10 plan and therefore makes the risk reduction even greater; with an elasticity of 0.5, the reduced risk of the 50–10 plan is worth $442 per insurance unit. Combined with the distortion reduction worth $902 per insurance unit, the total gain is $1,344 per insurance unit or an aggregate of $110.9 billion.

The greater risk aversion does not alter the relative attractiveness of the three major risk plans. The 50–10 plan still has a greater welfare gain than the 50–15 plan or the 100–15 plan.

Given the plausible range of risk aversion values that we have considered, the analysis of this section implies that the net overall welfare gain of the 50–10 major risk plan is between $34.3 billion (with demand elasticity of 0.33 and relative risk version of 1.0) and $110.9 billion (with a demand elasticity of 0.50 and relative risk aversion of 3.0). The shift to a 50–10 major risk plan would reduce aggregate welfare only with low-risk aversion (which reduces the value of the limit on out-of-pocket spending) and a low elasticity of demand (so that the reduced distortion is small and the distribution of coinsurance payments is not reduced by the major risk plan).

5. ELIMINATING THE TAX EXCLUSION TO FINANCE GOVERNMENT PROVIDED MAJOR RISK INSURANCE

The effects of major risk insurance on health care spending and the welfare gains from substituting a major risk plan for existing insurance would be obtained if the major risk policies are privately selected or if they are provided by the government. Eliminating the current income tax exclusion for employer paid health insurance premiums[21] or providing for tax deductible payments for out-of-pocket expenses[22] might be enough to cause individuals and their employers to choose major risk-type insurance policies. Alternatively, major risk insurance might be provided by the government, as originally suggested in Feldstein (1971a).

This section examines the net cost to the government of financing alternative major risk insurance plans as a function of the elasticity of demand. Table 3 showed that the cost of providing the major risk insurance depends on the design of the insurance and on the elasticity of demand for services. The 50–10 plan with no induced change in demand for health services would have a total cost of $328.7 billion of which $93.0 billion would be paid out of pocket by individuals at the time of care and the remaining $235.7 billion would be paid by the insurer. If, however, the demand elasticity is 0.5, the total cost of a 50–10 plan would be only $227.5 billion of which the insurer would pay $164.2 billion.

If the government were to provide major risk insurance without charge to the entire population, employers would no longer have a reason to provide compensation in the form of health insurance.[23] These

[21] Excluding employer paid health insurance from taxable income gives individuals a strong incentive to pay for health care through insurance and, therefore, to have low coinsurance rates. See Congressional Budget Office (1994) or Gruber and Poterba (1994b) for an analysis of recent legislative proposals to eliminate or limit the exclusion of employer-paid health insurance. For earlier discussions of employer payments for health insurance in taxable wage and salary income, see Feldstein (1973), Feldstein and Allison (1974) and Feldstein and Friedman (1977).

[22] Tax deductibility of the out-of-pocket payments could be done directly or through tax-deductible contributions to health savings accounts of the type that have recently been proposed. Either way would eliminate the current incentive to buy all health care through insurance.

[23] Indeed, it would also be necessary to preclude additional insurance by individuals since individuals who insured the coinsurance part of the major risk policies would be increasing the value of those policies and the expected cost of providing them. (On the impact of supplementary insurance on the cost of Medicare, see Pauly [1974].) Alternatively, individuals could be permitted to purchase additional insurance but only by paying a supplementary premium that reflects the additional cost of the major risk insurance. It is for this reason that having a publicly provided MRI policy would require removing the exclusion

premiums would then be converted to wage and salary income and, therefore, would be subject to income tax and FICA payroll tax. Calculations using the NMES data and the NBER's TAXSIM model indicate that this would raise $79.0 billion in federal taxes at 1995 levels.[24] Eliminating as well the deduction for medical expenditures in excess of 7.5% of AGI is estimated to reduce the government's tax expenditures by $4.1 billion in 1995 (Committee on Ways and Means, 1993).

The introduction of major risk insurance would also affect the outlay side of the federal budget in two important ways. First, the major risk policy would replace the existing Medicaid program for those below age 65 and the nondisabled. In 1995, this is a projected $50 billion, or one-third of total federal and state Medicaid spending.[25] Second, the increased cost sensitivity of the nonaged population would alter the cost structure of hospitals and the standards for treating different medical conditions. These standards would presumably spill over to the treatment of the Medicare population, lowering the government costs of that program as well. If one assumes that Medicare costs declined in the same proportion as total "private" health care spending (i.e., the spending by the population covered by major risk insurance), the reduced spending on health care would bring substantial savings in federal outlays. For example, with an elasticity of 0.33 the 50–10 plan reduces total private spending from $328.7 billion under the existing health insurance plan to $268.7 billion, a decline of 18 percent. Applying this same decline to the $174 billion of federal spending on Medicare implies an annual saving of $31.3 billion at 1995 levels.[26] This reduction in spending would not only be a source of financing for the major risk plan but also an improvement in resource allocation since these government insurance

from taxable income of medical expenses above 7.5% of AGI; this acts as a form of reinsurance which would undercut the gains from MRI.

24 Evidence in favor of the substitutability between benefits and cash wages is provided in Gruber (1994) and Gruber and Krueger (1991). The NMES data indicate the dollar amount of the health insurance premiums paid by employers for each health insurance unit in 1987. We have adjusted this to 1995 levels by the actual and projected growth of health care spending per capita. Using the income data in the NMES and the NBER's TAXSIM program, we then calculated the revenue gain that would result from converting these employer-paid health premiums to wage and salary income.

25 We do not consider MRI's effects on the remainder of the Medicaid program, since most spending on the aged consists of nursing home costs. There may be some effect on the medical treatment of the disabled, leading to an understatement of the federal and state Medicaid savings in our calculations.

26 We recognize, of course, that any savings in either private spending or government programs would only evolve over a number of years. We state these figures in terms of 1995 dollars even though they would only be fully achieved several years later.

programs induce an excess provision of health services in the same way that private insurance does.

Combining the $83.1 billion increase in tax revenue and the $81.3 billion reduction in government spending provides $164.4 billion toward the $196.7 billion total cost of providing a 50–10 major risk insurance plan with an elasticity of 0.33. Although using the income tax or payroll tax to finance the remaining cost of $32.3 billion a year (see line 2 of Table 6) would involve new sources of deadweight loss, this loss would almost certainly be less than the $34.3 billion aggregate welfare gain associated with the shift to a major risk insurance policy (see line 2 of Table 5). Even this deadweight loss of financing cost could be avoided by using a compulsory fixed-price insurance premium. With 82 million insurance units, the cost of financing the $32.3 billion shortfall would be slightly less than $400 per year.

Although we have not done a formal analysis, we suspect that a major risk policy with a $700 premium would leave almost all taxpayers better off than they are today, a reflection of the substantial overall net welfare gain of $34.3 billion. The tangible form of this benefit would be a large increase in net of tax wages (since employers would no longer be spending an average of about $3,200 a year on insurance premiums) and a possible gain through reduced risk bearing if the individuals are sufficiently risk averse.

A higher price elasticity of demand for health services reduces the government's net financing costs even further. Indeed, row 3 of Table 6 shows that with a demand elasticity of 0.5 the 50–10 major risk plan could be completely financed by a combination of taxing the wages and salaries that result from eliminating private insurance and the savings in federal government outlays that occur from reduced Medicare and Medicaid spending. The higher demand elasticity reduces the insurer's cost to only $164.2 billion, and this is more than offset by the combination of the $83.1 billion in additional revenue and the $102.8 billion in Medicare and Medicaid savings.

6. CONCLUSIONS

The analysis presented in this paper shows that a health insurance plan that has a 50-percent coinsurance rate but limits out-of-pocket spending to 10 percent of income can substantially reduce total medical spending, even though a substantial part of health outlays are incurred by families spending 10 percent or more of family income on health care.

The change in health care spending reduces the deadweight loss that now results because low coinsurance rates induce excessive consump-

TABLE 6.
Eliminating the Tax Exclusion to Finance MRI Plans

		($ Billions)					
Plan	Elasticity	*Insurance cost*	*Eliminating tax exclusion*	*Eliminating tax expenditures*	*Eliminating Medicaid below age 65*	*Medicare cost reductions*	*Net cost*
50–10	0	235.7	79.0	4.1	50.0	0.0	102.6
	.33	196.7	79.0	4.1	50.0	31.3	32.3
	.5	164.2	79.0	4.1	50.0	52.8	−21.7
50–15	0	222.2	79.0	4.1	50.0	0.0	89.1
	.33	172.7	79.0	4.1	50.0	40.1	−0.5
	.5	142.8	79.0	4.1	50.0	61.4	−51.7
100–15	0	162.8	79.0	4.1	50.0	0.0	29.7
	.33	137.3	79.0	4.1	50.0	41.0	−36.8
	.5	103.6	79.0	4.1	50.0	70.1	−99.6

Note: All figures in 1995 dollars. See text for details.

tion of health care. The combination of this reduction in the deadweight loss of excessive health care spending and the change in the risk of out-of-pocket spending represents a net welfare gain under most plausible assumptions about demand elasticities and risk aversion.

Our estimates of the aggregate welfare gain from shifting to the 50–10 major risk policy (a 50-percent coinsurance rate and a 10 percent of income maximum out of pocket payment) range from $34 billion with a low degree of risk aversion (a logarithmic utility function) and a low price elasticity of demand (0.33) to $110 billion with a higher degree of risk aversion (a constant relative risk aversion of 3) and higher demand elasticity (0.5).

We show that, with a demand elasticity of 0.5, universal government provision of this 50–10 major risk insurance policy could be financed by a combination of the additional tax revenue that would automatically result from the conversion to wage and salary income of the existing employer payments for health insurance and from the reduction in Medicare and Medicaid spending in parallel to the reduction in private health spending.

APPENDIX: "SYNTHETIC" POPULATION ESTIMATES

As noted in the text, a problem with our analysis by income class is that the sample of low income privately insured is not likely to be a representative group. Instead, these are most likely sick individuals whose health has impeded their earnings abilities; this is reflected in their high spending in Table 4.

Therefore, we have replicated our analysis with a "synthetic" sample that is designed to overcome this problem. The basic idea is to replace the individual's own spending with a random amount of spending that is not a function of income but that reflects the demographic-adjusted spending distribution. The method for doing so is similar to that described in Section 4.2. We begin by dividing our sample into four demographic types of insurance units: single adults, single adults with children, couples, and couples with children. We rank each observation within a demographic type by spending, divide the ranked list into 100 equal intervals, and assign a probability of 0.01 to each interval. We then assign each unit in that demographic group a spending level drawn randomly from that distribution. Both here and in Section 4.2, we have expanded the sample so that there are a sufficient number of observations in each demographic group. We do so by replicating our original sample to inflate the size to 20,000 insurance units.

The results of this analysis are presented in Table A1, which parallels the earlier Table 4. The key difference between the tables is that the

TABLE A1.

Effects of the 50–10 Major Risk Insurance Plans by Income Category Using the Pooled Distribution

		Average			Aggregate (Billions)		
	Elasticity	*Out-of-pocket expenditures*	*Insurance*	*Total*	*Out-of-pocket expenditures*	*Insurance*	*Total*
Below poverty							
Original plan		752	2,912	3,663	5.0	26.4	31.4
50–10 plan	0	403	3,260	3,663	3.5	28.0	31.4
	.33	388	3,228	3,617	3.3	27.7	31.0
	.5	378	3,193	3,571	3.2	27.4	30.6
Between poverty and twice poverty							
Original plan		775	3,076	3,851	12.7	56.7	69.4
50–10 plan	0	831	3,021	3,851	15.0	54.4	69.4
	.33	754	2,900	3,655	13.6	52.2	65.8
	.5	710	2,775	3,485	12.8	50.0	62.8
Between twice poverty and $50,000							
Original plan		721	3,150	3,871	30.0	132	161.7
50–10 plan	0	1,230	2,641	3,871	51.4	110.3	161.7
	.33	1,038	2,354	3,392	43.4	98.3	141.7
	.5	935	2,069	3,004	39.1	86.4	125.5
Above $50,000							
Original plan		938	4,489	5,427	14.6	69.7	84.2
50–10 plan	0	2,163	3,264	5,427	33.6	50.6	84.2
	.33	1,675	2,623	4,297	26.0	40.7	66.7
	.5	1,453	2,235	3,688	22.6	34.7	57.2

Note: All figures in 1995 dollars. "Average" columns refer to calculations per insurance unit; "Aggregate" columns refer to calculations for the nation as a whole, and they are in billions of dollars. Each block of the table refers to the effect on insurance units in that income bracket.

ex ante distribution of spending is now flat until the highest income group, and then somewhat higher for that group; this reflects the demographic mix of the highest income group, which is more likely to contain (high spending) married couples with children. This contrasts with the U-shaped pattern seen in Table 4.

The basic findings, however, are quite similar to those discussed in the context of Table 4: There is a substantial rise in out-of-pocket spending with income under the MRI plan, and the reduction in health care spending is much larger for higher-income than for lower-income individuals. Thus, while this approach eradicates the anomalous finding of much higher spending for low-income individuals, the basic income distribution effects of an MRI-type plan are unchanged.

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