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ABSTRACT

The single most important long run fiscal issue facing the developed world is the aging of its populations. In virtually every developed country, there will be a steep increase in the ratio of the elderly to the working age population over the first half of the 21st century. The purpose of our paper is to provide an international perspective on public policies directed towards the elderly, and to discuss the implications of these policies for both the elderly and for government budgets. We begin by briefly reviewing the panoply of public programs targeted to the elderly, and document wide variation among the otherwise similar OECD nations in government spending directed towards the elderly. We then review what this increased spending is buying the elderly by providing some evidence on the relationship between social insurance program incentives and labor supply, between public spending and average elderly incomes, and between public spending and elderly poverty rates. We provide some suggestive evidence that public spending on the elderly is doing little to raise their incomes on average, perhaps due to increased early retirement, but that it is significantly protecting them against poverty. We then ask what the demographic transition bodes for the future: if countries do not change their behavior, what is the likely path for their fiscal situations? We also show that, if the past is any guide, the burden of paying these high fiscal bills is likely to be paid through reduced spending elsewhere, particularly on programs for the non-elderly.

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The single most important long run fiscal issue facing the developed world is the aging of its populations. In virtually every developed country, there will be a steep increase in the ratio of the elderly to the working age population over the first half of the 21st century. Figure 1, from Gruber and Wise (1999b) shows the ratio of the number of persons age 65 and over to the number age 20-64 for a sample of 11 countries. In six of the countries, this ratio will exceed 0.5 by 2050; in Japan, it will exceed 0.6, so that for every "working age" person there are 0.6 "retirement age" persons. As is immediately apparent, the developed world is moving into uncharted territory over the next fifty years.

Moreover, this population aging is happening in environments which are unprecedentedly generous to the elderly citizens of developed nations. In every nation the elderly retire into a world of guaranteed income support and health insurance coverage. And, thus far, the reaction of the developed world to population aging has been to simply increase spending on the elderly. From 1980 to 1995, as the percentage of the population over age 65 in OECD nations rose by almost one-fifth, the percentage of GDP transferred to the elderly rose by almost one-quarter.

But is should be immediately apparent from Figure 1 that such a reaction to population aging is not sustainable. Simple projections, described in more detail below, suggest that if the current relationship between population aging and social spending on the elderly continues, the share of GDP that developed nations transfer to the elderly will rise by almost 40% between now and 2050, reaching more than 11% of GDP by the midpoint of the next century. This would require either enormous increases in the tax burdens on the relatively small group of workers, or enormous reductions in spending on other demographic groups. Moreover, this is not a medium-run phenomenon that will disappear in the second half of the 21st century; due to falling

mortality and falling fertility, we are seeing a secular shift in population composition that will persist for the foreseeable future.

The purpose of our paper is to provide an international perspective on the set of programs that have given rise to this situation, by reviewing both the institutions through which the elderly are supported by the public sector, and the implications for both the elderly and for government budgets. In the next section, we very briefly review the panoply of public programs targeted to the elderly. In this section and throughout the paper, we focus on the OECD nations for which data are most readily available. We document the size of spending on the elderly, relative to both national economies and government budgets, and how this varies across the relatively similar OECD nations. In Part II, we then review what this increased spending is buying the elderly by providing some evidence on the relationship between social insurance program incentives and labor supply, between public spending and average elderly incomes, and between public spending and poverty rates. In Part III, we then ask what the demographic transition bodes for the future: if countries do not change their behavior, what is the likely path for their fiscal situations? And where is the burden of paying these high fiscal bills likely to fall? Part IV then concludes by summarizing what we have learned.

Part I: What do Public Programs in Developed Countries Do for the Elderly?

Each developed nation has a unique set of programs to support the elderly and it is difficult and potentially misleading to attempt to categorize simply the nature of elderly support. But we nevertheless in this section attempt to do so, providing enough flexibility to discuss the major types of programs and the kinds of deviations from the norm that one observes.

Income Support Programs

Every developed nation (and indeed the vast majority of LDCs as well) has some form of universal income support program for their elderly populations. Table 1 illustrates the structure of these social security programs for the sample of countries reviewed in Gruber and Wise (1999a). It first shows the early and normal entitlement ages for these programs. The early entitlement age is the age at which benefits can first be claimed, while the normal retirement age is a benchmark measure against which benefits are sometimes (but not always) adjusted. For example, in the U.S., individuals claiming their Social Security benefits early (between ages 62 and 65) are subject to an actuarial reduction of those benefits. In fact, in most countries in the Gruber and Wise study, the modal age of entitlement was the early entitlement age; the "normal" age of entitlement in fact is no longer normal.

The next column shows the typical replacement rates available to a married male worker (with a nonworking spouse) at the age of early entitlement. Two things are notable about this figure. First, in some countries it is quite high; in France, for example, the typical worker who retires at age 60 replaces 90% of the earnings on his pre-retirement job. Second, it is quite variable across countries, with retirees in the U.S. only replacing 41% of their earnings if they retire early.

This table obscures important differences in the structure of income support programs. In the U.S., the primary support program is Social Security, which is not means tested but is conditioned on modest labor force attachment. In Canada, in contrast, there are three types of programs: a universal demogrant (conditional only on citizenship) at age 65; an earnings-related pension available at age 60; and means-tested transfers available at age 60. In Germany,

although the official age of early entitlement for Social Security is age 60, workers can entitle themselves to their full benefits by becoming unemployed at age 57. In Italy, until recent reforms were put in place, entitlement was conditional only on 35 years of labor market experience, so that individuals who started work at age 20 could retire at age 55 with full benefits.

An important complement to income transfer programs is disability programs, such as Disability Insurance in the U.S. There is significant variation across developed countries in the extent to which these programs truly screen on disability, as opposed to acting as backdoor routes to early retirement. In the U.S., disability screening is severe, with only about one-third of applicants initially approved; as a result, fewer than one-seventh of older (age 60-64) men are on disability. In Sweden, on the other hand, disability screening is much more lax, and as a result one-third of 64 year old men are on disability. Similarly, a large fraction of employees in Germany "retire" through the disability program. Indeed a much larger fraction of employees retire through the disability and unemployment programs than through the social security program (Borsch-Supan and Schnabel, 1999).

Health Insurance

In most developed countries, the elderly do not receive particularly special care under the health care system; health care (or health insurance) is a universal entitlement to which the elderly benefit as do the remainder of the population. The U.S. is exceptional in having largely private insurance for the non-elderly population, and a public entitlement for the elderly through the Medicare program. The only other major industrialized nation with a separate system of health care for the elderly is Japan. The elderly are differentiated in many other countries, in that

health care is financed by payroll taxation so that retirees bear no funding burden. But the fundamental structure of care and insurance is similar for the elderly and non-elderly. This linkage heightens even further the dependence of the elderly on non-elderly portions of public budgets.

Developed countries also use a variety of mechanisms to attempt to control medical costs. In the U.S., public insurance costs through Medicare are primarily controlled through cost sharing on the patient side and restrictive provider reimbursement, although for many services cost sharing is limited by either employer-provided or individually purchased supplemental insurance. In many other countries, such as Germany or Italy, there is relatively little cost sharing, but stricter controls on provider reimbursement and other rationing mechanisms such as expenditure caps and global budgets (Cutler, 1999).

A critical and growing component of health care spending on the elderly is long-term care. While in most OECD nations long term care is fully publicly funded, there is much more heterogeneity across developed countries in the public provision of long term care. In the U.S., much of long term care is financed by public programs, but the care is provided privately, and wealthy individuals pay their own way. In other countries such as Italy and Belgium, long term care is funded through a social insurance scheme. In others such as Canada there is partial public funding of long term care, and roughly one-half of the institutions are publicly owned.

Non-Health In-Kind Transfer Programs

The majority of the expenditures on non-health in-kind programs for the elderly goes to residential care, home-help services, and rehabilitation services. Almost every country we study

here has at least one program that falls into one of these categories, either specifically for the elderly or for which the elderly are eligible. The other main expenditure on in-kind programs comes from housing benefits. However, only about two-thirds of the countries that we study have housing benefits. A few countries have other "miscellaneous" in-kind benefits for which the elderly are eligible, such as food or subsidized public transport. However, the contribution of these programs to the overall social expenditure is quite small.

Facts on Spending

Putting this panoply of programs together, we see a consistent pattern of substantial transfers to the elderly across developed countries, but also substantial heterogeneity in the amount of resources devoted to that group. Figure 2 presents the distribution across developed nations of the percentage of GDP that is transferred to the elderly as cash or (non-health) in-kind benefits; these figures capture only current spending, and not any future entitlements that are being built up through social security programs. These figures were calculated from the OECD's Social Expenditure Database. For some programs, such as age-targeted social insurance programs, it was straightforward to assess the amount of spending on the elderly. For other programs, such as health care or public housing, it was more difficult. Where possible, we contacted experts from each of the countries to assist us in assessing the distribution of spending through other programs across population groups.

As Figure 2 shows, there is wide variation across these fairly similar industrialized nations in their spending on the elderly. For example, Italy (13.2%) devotes over four times as much of GDP to the elderly as does Australia (3.2%). While the U.S. is towards the low end,

with the government spending only 6.2% of GDP on the elderly, it still spends more than Australia, Canada, and Japan, and roughly as much as Switzerland. On average, the governments of this sample of developed nations transfers 8.2% of GDP to the elderly through social programs.

Of course, this is an understated figure for two reasons. First, for a number of categories of social spending in many countries, we remain unsure about their division between the elderly and the non-elderly. Second, we have not included health care benefits, a large share of which accrue to the elderly. Figure 3 shows the increase to our spending figures if we attribute health and other unsure categories: for health care, we used the data from OECD (1998) to divide health care spending into the portion on the elderly and the portion on the non-elderly;[1] for other unsure categories, we assumed that spending on the elderly was in proportion to their share of the population. The levels of spending on the elderly are much higher here, about 2.7% higher on average, so that across this sample of countries we see 10.9% of GDP transferred to the elderly. But for the remainder of the analysis we will use the more conservative estimate that we can measure accurately.

Part of this variation in spending on the elderly reflects general tastes for social spending across these nations. Figure 4 explores this issue by showing the share of social spending that goes to the elderly. While Italy continues to transfer the largest share of social spending to the elderly (52%) and Australia the least (20%), the U.S. now ranks fifth in share of social spending

[1]This data shows the percentage of total health care spending on the elderly, not public spending, but for most countries in our sample these are one in the same. For countries for which we did not have this data, we used the sample average percent of health care spending on the elderly to assign it. For the U.S., we had true data on public spending on elder health so no allocation was required.

to the elderly at 40%, and Japan ranks second (44%).

Part II: What Does Public Spending Buy?

This dramatic variation in spending on the elderly raises the natural question of what increased spending buys for the elderly. There are two extreme alternatives that one might expect on this question. On the one hand, this variation could reflect simply variations across countries in the tastes for public vs. private spending on the elderly, so that there is little net impact on the living standards of the elderly, but rather simply a transfer of responsibility for their care. That is, in this extreme, there would be full "crowd-out" of private spending by public spending on the elderly, with little net impact on the long-run resources available to them.

At the other extreme, it is possible that these programs are substantially increasing the living standards of the elderly, and that without them there would be significantly lower well being in this population. In the U.S., for example, private health insurance of the elderly was reported to be quite modest before the publicly provided Medicare program arose in the mid-1960s. At this extreme, crowdout is negligible, and increased transfers to the elderly bring real benefits to them.

It is difficult with aggregate data to crisply distinguish these extremes, not to mention to precisely estimate where in between the truth lies. But three important pieces of evidence can be brought to bear which suggest merit to both views. The first, focusing on the labor supply responses to public pension incentives, suggests that there is a substantial crowdout of work among the elderly by public pension programs. The second further suggests crowdout by showing no relationship between the relative incomes of the elderly and the share of GDP

transferred to them. The third, however, shows that the elderly poverty rate is negatively related to transfers to the elderly, suggesting that at the bottom of the income distribution these transfers are improving living standards.

Public Pension Incentives and Elderly Labor Supply

One avenue through which the "crowdout" noted above can arise is through the labor supply decisions of the elderly. If larger public programs induce the elderly to retire earlier, then they will simply serve to displace private labor earnings with public pension dollars.

This issue was the topic of a recent study that we directed (Gruber and Wise, 1999a). We convened teams of experts from 11 countries to study the relationship between public pension program structures and the retirement decisions of older workers. This study produced three important conclusions. First, as illustrated in Figure 5, there is substantial disparity in the labor force participation rates of older workers across developed nations. The countries in this figure are ordered by labor force participation at age 65. At age 50 approximately 90% of men are in the labor force in all of the countries. But the decline after age 50 varies greatly among countries: by age 69 virtually no men in Belgium are working; in Japan almost 50% are still in the labor force. Indeed, most men in Belgium are no longer in the labor force at age 65, and only about 25% are working at age 60; in Japan, on the other hand, 60% are working at 65 and 75% at age 60.

Second, there is also significant disparities across nations in the incentives that they put in place for continued work at older ages. Many Social Security systems, particularly in Europe, both provide benefits which replace a substantial portion of pre-retirement earnings, and offer no

upwards adjustment to benefits for work beyond the early entitlement age. As a result, these systems provide substantial "implicit taxes" on work at older ages, since workers can receive virtually their full incomes even if they are retired. This is in contrast to the U.S., which has a relatively low replacement rate (41% for the median worker), and provides a significant incentive for work past age 62, by both increasing benefits by 6.67% for each year worked to age 65, and by recomputing benefits to account for higher earnings years at older ages.

Table 2 shows the results of detailed calculations of these implicit taxes carried out by the countries in the Gruber and Wise study. These calculations were all done on a comparable basis, considering a man born in 1930 who earned the median level of wages throughout his life, with a wife three years younger who never worked. The results are striking. For example, in France, there is an 80% tax on work past one's 60th birthday, since the replacement rate is so high (91%), and it is not adjusted for additional work. Indeed, in the Netherlands, the tax rate is actually 141%, due to the fact that the older person who continues to work not only forgoes benefits equal to 91% of his wage, but also pays very steep income and payroll taxes on the wages that he does earn. In contrast, in the U.S., there is actually a small subsidy to continued work at age 62, due to the incentives put in place to continue working at that age.

The third, and perhaps most, important finding of the Gruber and Wise study is that there appears to be a very strong correlation between the retirement incentives put in place by public pension systems and the actual retirement decisions of older workers. We illustrate this point in two way, using data from our summary paper (Gruber and Wise, 1999b). First, we show the "hazard rate", or the conditional exit rate from the labor force, for France, in Figure 6. This hazard has a enormous "spike" at age 60, which is the age of entitlement for Social Security

benefits. That is, of the workers still working at age 60, *sixty percent* leave the labor force at that age. This cannot be easily explained by any mechanism other than the public pension structure. Indeed, Gruber and Wise show that 15 years earlier, when the age of public pension entitlement was 65, there was little labor force exit at age 60, and much more at age 65; this "spike" in the hazard evolved only after the early retirement provision at age 60 was introduced.

Next, we show the relationship between the tax rates documented in Table 2 and the extent of early withdrawal from the labor force illustrated by Figure 5. Figure 7 graphs the total amount of "non-work" from age 55-65 (the percentage of the male population in that age interval not working) against the logarithm of the "tax force" to retire, which is the sum of tax rates on work from age 55-69.[2] We see a striking correspondence between these two, with the tax force explaining over 80% of the variation in non-work.

This finding must be of course interpreted with some caution. There are a host of other factors that differ across nations in a cross-section, and these may be correlated with both the tax force and non-work measures. But this strong relationship suggests that there may be important "crowding out" of large public pension systems along at least one dimension, labor supply. Moreover, recent work by Richard Johnson (1999) confirms the significant negative impact of retirement incentives on labor supply using within country changes in retirement incentives for a sample of countries throughout the 20th century (see below for a discussion of the advantages of this approach).

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[2]We use tax rates after age 65 as well because forward looking individuals should consider the entire future path of tax rates in making their retirement decisions. As we show in Gruber and Wise (1999b), our conclusions are not sensitive to the formulation of either the non-work or tax force measures.

Average Incomes of the Elderly

Another avenue for understanding the implications of public spending on elderly outcomes is to examine the implications directly for the living standards of the elderly. We do so by examining the relationship between spending on the elderly and their relative incomes, from Hauser (1997). The income measure we sue is the ratio of the average income of pensioner households, households where there is someone over age 65 who is receiving a pension, to the average income of non-pensioner households.[3] These data are only available for 9 of our 12 sample countries.

Figure 8 shows the relationship between relative incomes and the percentage of GDP spent on the elderly. The lack of correspondence between the measures of living standards and the measures of spending on the elderly is striking. The fact that countries that transfer such dramatically differing shares of their incomes to the elderly have no differences in elderly living circumstances is striking. Canada, which transfers less than 5% of GDP to the elderly, and Germany, which transfers over 10%, have essentially the same ratio of elderly to non-elderly incomes; Italy, which transfer over 13%, has much lower elderly incomes.

Once again, this result must be interpreted with considerable caution. If countries where there is more underlying structural reason for the elderly to have lower incomes are the ones that spend more on the elderly, then it could cause the lack of correlation between spending and elderly living standards. But these findings are nevertheless suggestive of substantial "crowdout"

[3]This is actually a simple average of the series for those age 65-74 and those age 75+; these two series are so highly correlated (0.97) that this is a reasonable representation of all those over age 65.

of private mechanisms by public mechanisms; where the public sector transfers more to the elderly, they are no better off on average.[4]

Elderly Poverty Rates

Even if there is no impact on average elderly incomes, it is possible that larger transfers to the elderly are successful in keeping them out of poverty. A negative impact on poverty rates even while there is no impact on average incomes could arise either if transfers are either tightly targeted to the poorest elderly, or if transfers are raising incomes at the bottom but lowering them at the top, leading to no impact on average incomes.

Figure 9 therefore compares a measure of the poverty of the elderly to our data on transfers to the elderly as a share of GDP. This (relative) poverty indicator measures the percentage of individuals age 65 or older whose incomes are less than 40% of the median disposable income in the nation; these data come from Smeeding (1997). In fact, we do see a striking negative correspondence between spending and poverty; those nations that spend more on the elderly do have lower elderly poverty rates. Italy and France, which transfer more than 12% of their GDP to the elderly, have elderly poverty rates of less than 5%; Australia, Japan, and the U.S., which transfer less than 7%, have poverty rates above 18%. While the fit between these two series is not perfect, the relationship suggests that for every percentage point of GDP transferred to the elderly, their poverty rates fall by 1.33 percentage points.

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[4]It is not obvious whether the correct variable for the analysis here is the share of GDP spent on the elderly, or the share of GDP spent per elderly (the latter being the former divided by the elderly share of the population). But the results in Figures 8 and 9 are insensitive to whichever of these definitions is used.

Thus, the two different income measures used in the last two subsections paint very different pictures of the impacts of government spending. While it is once again important to highlight the suggestive nature of these findings, they do suggest that more spending on the elderly is successful on in removing them from the worst circumstances, but that at higher income levels it is undoing private sources of support.

Part III: Implications of Population Aging for Public Spending

Spending on the Elderly

A critical question for fiscal policy in developed nations is how public spending on the elderly will evolve as the demographic transition continues. Making these types of projections based on the past relationship between aging and spending is difficult. But they provide a useful benchmark against which future aging trends can be analyzed.

We make these projections by matching our data on the distribution of spending on the elderly to data on the aging of populations in OECD countries. Since we have data on both of these variables over time (since 1980), we can now run panel data regressions, controlling for country-specific dummies to capture time invariant tastes for spending on the elderly, and year-specific dummies to control for common trends in population and spending around the world. for the period 1980 to 1995. That is, for this measure we can consider the more robust method of considering how *within country changes* in social insurance spending translate into parallel *within country changes* in health outcomes. This provides a more convincing estimate of the impact of spending than does the simple cross-country comparisons of the previous section.

We in fact find a very strong positive relationship between within-country changes in the

share of the population that is elderly and within-country changes in the share of GDP that is devoted to public spending on the elderly. The first row of Table 3 shows the coefficient on the share of the population that is elderly from a regression of elderly spending as a share of GDP on elderly population share, controlling for a full set of country and year fixed effects. There is a precisely estimated coefficient of 0.26; each percentage point increase in the ratio of the elderly population to total population raises spending on the elderly by 0.26 percentage points of GDP. The figure at the bottom of the cell, 0.47, shows the elasticity of spending on the elderly; for each 1 percent rise in the elderly population share, spending on the elderly rises by 0.47%.

Table 4 shows the results of taking this estimate and extrapolating what will happen to spending on the elderly over the coming decades if this relationship continues to hold. The first column of this table shows actual spending on the elderly, as a share of GDP, in 1995. The remaining columns extrapolate spending in future years, based on OECD projections for the elderly share of the population.

The results are striking. We find that, on average, the percent of GDP spent on the elderly by this projection method would rise from almost one-half, from 8.2 percent to 11.4 percent, by 2050. The increase varies substantially across countries, reflecting different patterns of population aging. Australia starts with the lowest spending on the elderly in our sample, but has the highest proportional increase (more than doubling by 2050). Germany, Italy, Japan, and Sweden are projected to see an increase in spending on the elderly relative to GDP of 4 percentage points or more. On the other hand, Sweden and the United States have relatively modest projected increases of less than 2 percentage points.

Implications for Government Finance

What are the implications of this dramatic increase in spending on the elderly? There are three routes that governments can take to finance a rising share of the elderly: reducing spending in other areas; raising taxes; or increasing debts. Our evidence suggests that the impact of population aging has been felt mostly in the first of these categories.

The second row of Table 3 shows a regression of spending on all categories of transfers, excluding health and those transfers we can clearly assign to the elderly, as a share of GDP, on the elderly population share, once again controlling for a full set of country and year fixed effects. We call this measure "other non-health spending". It is important to highlight that this dependent variable includes our "unsure" categories of spending, some of which may be on the elderly, but which is impossible to assign cleanly. As a result, in the next two rows of Table 4 we divide other non-health spending into categories of spending for which we can clearly assign their impacts to the non-elderly (education, job training), which we label "non-elderly, non-health spending" and categories for which we cannot clearly do such assignment (disability, housing benefits, rehabilitation services), which we label "unsure non-health spending".

These three rows of Table 3 deliver a clear message: rising elderly population shares are strongly negatively associated with other non-health spending. In fact, the estimated impact of a 1% within-country increase in elderly population leading to a fall in other non-health spending/GDP of -0.33%. Thus, on net, there is no estimated impact of an increase in the elderly population on transfer spending; the increased transfers to the elderly are offset by reduced spending in other categories.

As the next two rows show, however, only about 42% of this total other non-health

spending impact is through categories clearly assigned to the non-elderly; more than half is through unsure categories. This makes it somewhat difficult to assess the full welfare implications of the spending reductions that accompany population aging. Even in the limiting case where all of the "unsure" spending goes to the elderly, however, we are still seeing a significant negative impact on spending on the non-elderly as the population ages.

Of course, an increase in the elderly population should also increase health spending, and indeed there is a positive relationship with health spending, as the next row of Table 3 shows, but it is not significant. Adding all three elements (elderly transfers, other transfers, and health), there remains a very small and insignificant relationship between within-country changes in the elderly population and total government transfer plus health spending. This finding suggests that, if current trends continue, the brunt of the burden of an aging society will be borne through reduced spending elsewhere, including on the non-elderly.

Part IV: Where do We Go From Here?

The wide variation in the share of national resources devoted to the elderly across similar developed nations documented in this study is striking. Part of this variation reflects different shares of the population that is elderly, but this variation explains only about 10% of the within country variance in elderly spending. There are clearly substantial differences across countries in their tastes for redistribution to the elderly population.

We have explored two dimensions of this redistribution. We first examined the implications for the well-being of the elderly, for which we found mixed evidence. Looking across countries, there is very suggestive evidence that more generous retirement income support

systems, which generally provide large disincentives to labor supply at older ages, lead to much lower labor supply levels among the elderly. Perhaps as a reason, there is no correlation between the share of GDP transferred to the elderly and their income levels. On the other hand, there is evidence that an increase in the level of transfers to the elderly their poverty rates.

Second, we have shown that increases in the elderly population translate into significant increases in transfers to the elderly. Indeed, if the trends of the recent past can be extrapolated into the future, population aging over the next 50 years will result in 11.4% of GDP being devoted to spending on the elderly on average among our sample of developed countries. At the same time, we find that this population aging causes equal and opposite reductions in spending elsewhere, so that on net there is no change in transfers as the population ages.

This finding is good news for fiscal balances, but potentially bad news for the non-elderly. An important priority for future work is to explore the mechanisms through which population aging affects the spending on the non-elderly. Are the gains that we document in terms of elderly health matched by costly losses in terms of the education, health, or other well-being of the non-elderly? If so, it would appear that national priorities in all of these countries should be to find ways to ease the growing imbalances that aging populations are forcing upon us.

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Table 1: Institutional Features of Social Security Programs

Country	Early Retirement Age Age	Normal Retirement Age	Replacement Rate at Early Retirement Age
Belgium	60	65	77
Canada	60	65	20
France	60	65	91
Germany	60	65	62
Italy	55	60	75
Japan	60	65	54
The Netherlands	60	65	91
Spain	60	65	63
Sweden	60	65	54
The United Kingdom	60	70	48
The United States	62	65	41

Source: Gruber and Wise (1999b)

Table 2: Retirement Incentives of Social Security Programs

Country	Tax Rate at Early Retirement (%)
Belgium	82
Canada	8
France	80
Germany	35
Italy	81
Japan	47
The Netherlands	141
Spain	-23
Sweden	28
The United Kingdom	75
The United States	-1

Source: Gruber and Wise (1999b)

Table 3: Elderly Population and Social Spending

Dependent Variable	Coefficient on Elderly/Total Population
Spending on Elderly/GDP	0.264 (0.065) {0.47}
Other Non-Health Social Spending/GDP	-0.332 (0.129) {-0.57}
Non-Elderly Non-Health Spending/GDP	-0.186 (0.104) {-0.369}
Unsure Non-Health Spending/GDP	-0.147 (0.048) {-2.09}
Health Spending/GDP	0.099 (0.069) {0.22}
Total Spending/GDP	0.030 (0.143) {0.02}
Number of Obs	208

Note: Table shows coefficient on elderly share of population in regression where dependent variable is listed in first column; all regressions control for full set of country and year fixed effects. Standard errors in parentheses; elasticities in brackets.

Table 4: Projected Social Spending (as a percent of GDP) on the Elderly

	1995 (Actual)	2010	2020	2030	2040	2050
Australia	3.1	3.4	4.4	5.3	6.1	6.4
Belgium	9.8	10.1	11.0	12.0	12.4	12.2
Canada	4.6	5.1	6.1	7.3	7.5	7.5
France	12.3	12.7	13.6	14.4	14.9	15.0
Germany	11.1	12.1	12.6	14.0	15.1	15.1
Italy	13.0	14.1	14.9	16.2	17.7	17.8
Japan	6.1	7.8	9.1	9.3	10.1	10.4
Netherlands	7.3	7.9	9.2	10.5	11.2	10.8
Spain	9.7	10.5	11.2	12.6	14.2	15.0
Sweden	8.8	9.0	9.7	10.0	10.4	10.1
Switzerland	6.8	7.5	8.6	10.0	10.6	10.0
United Kingdom	8.1	8.2	9.3	10.4	10.8	10.8
United States	6.2	6.3	6.8	7.5	8.0	7.8
Sample Average	8.2	8.8	9.7	10.7	11.4	11.4

Figure 1. Population 65+ to 20-64

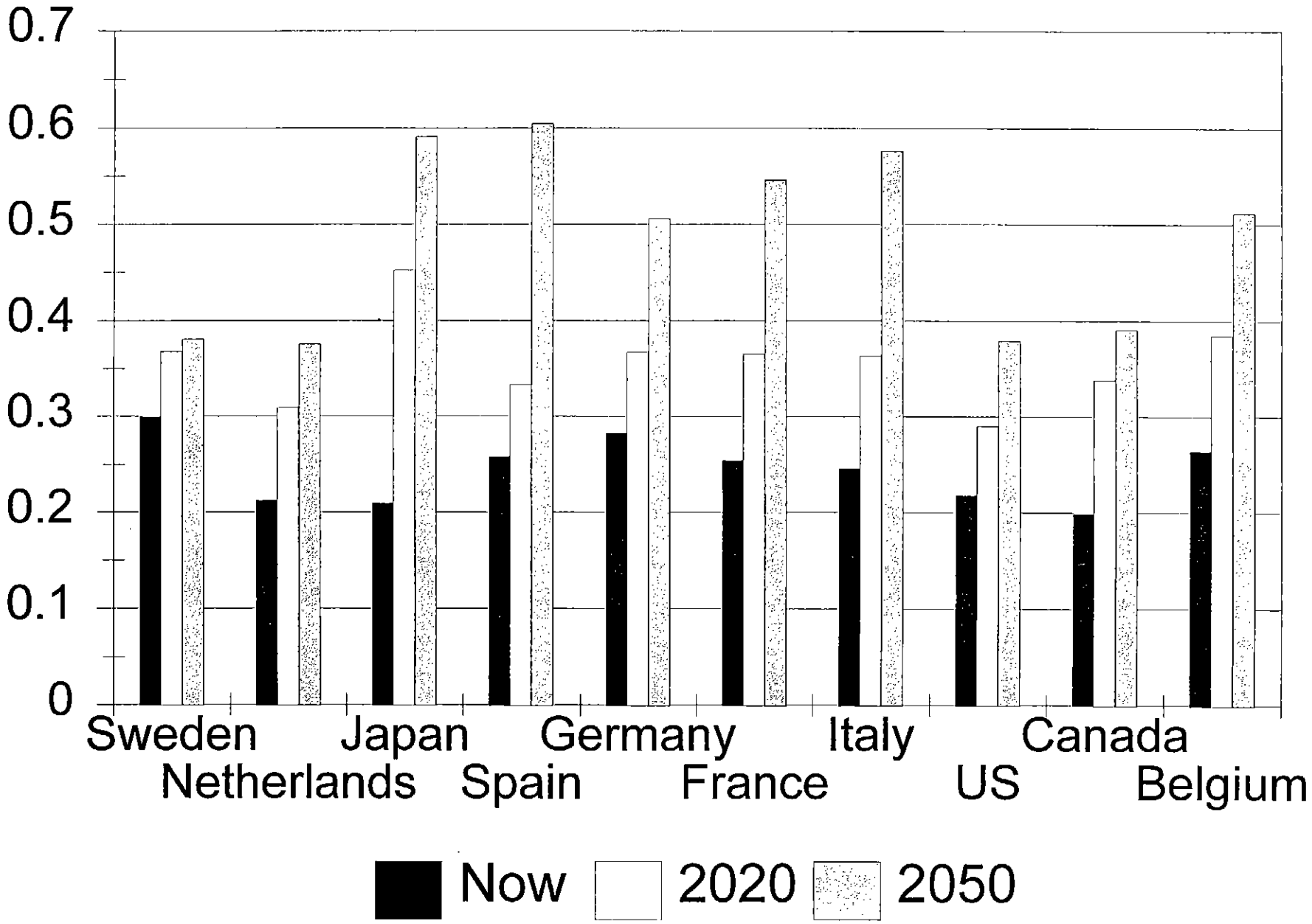


Figure 2

Percent of GDP spent on Elderly: No Allocation

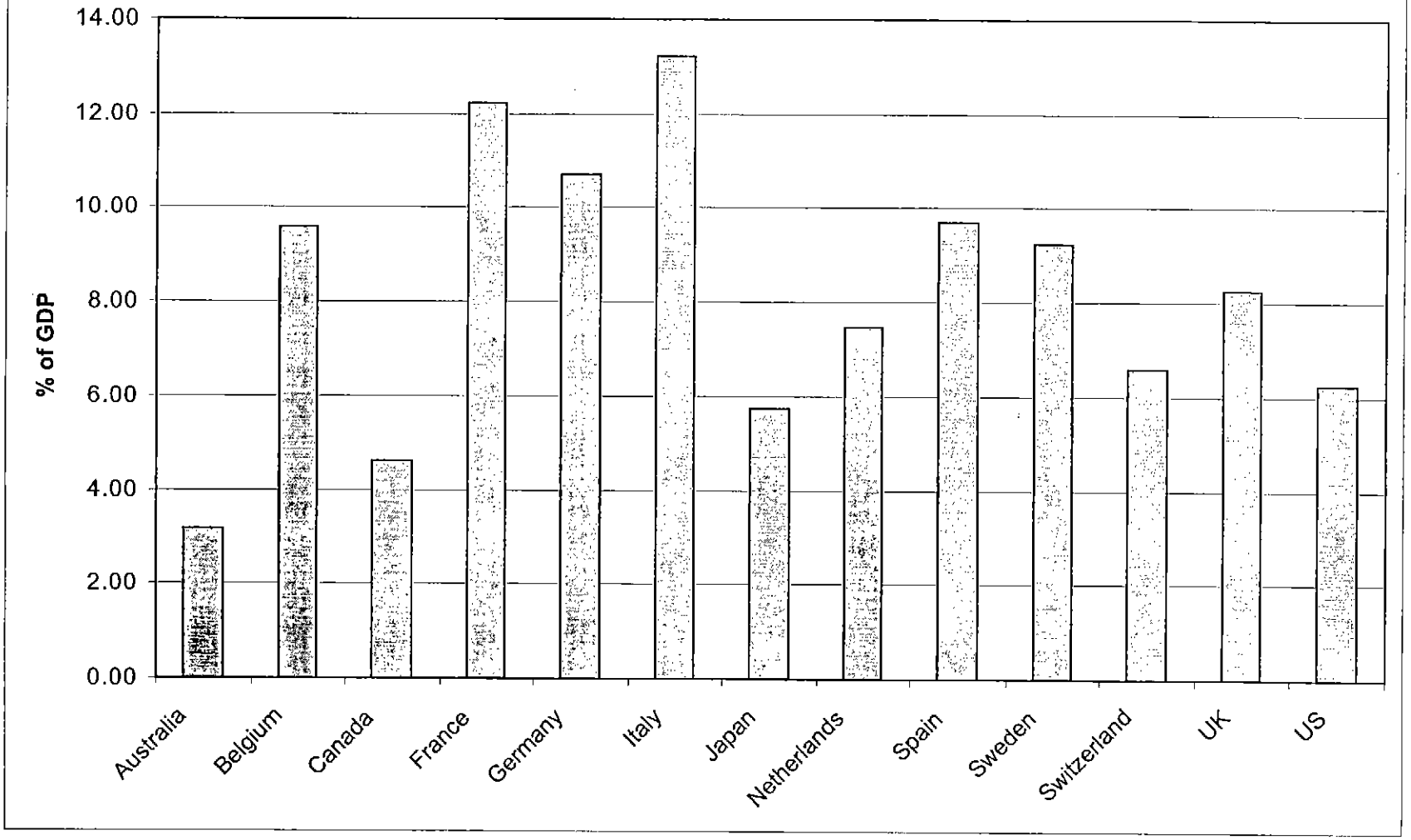


Figure 3

Percent of GDP spent on Elderly: Unsure & Health Allocated by Population

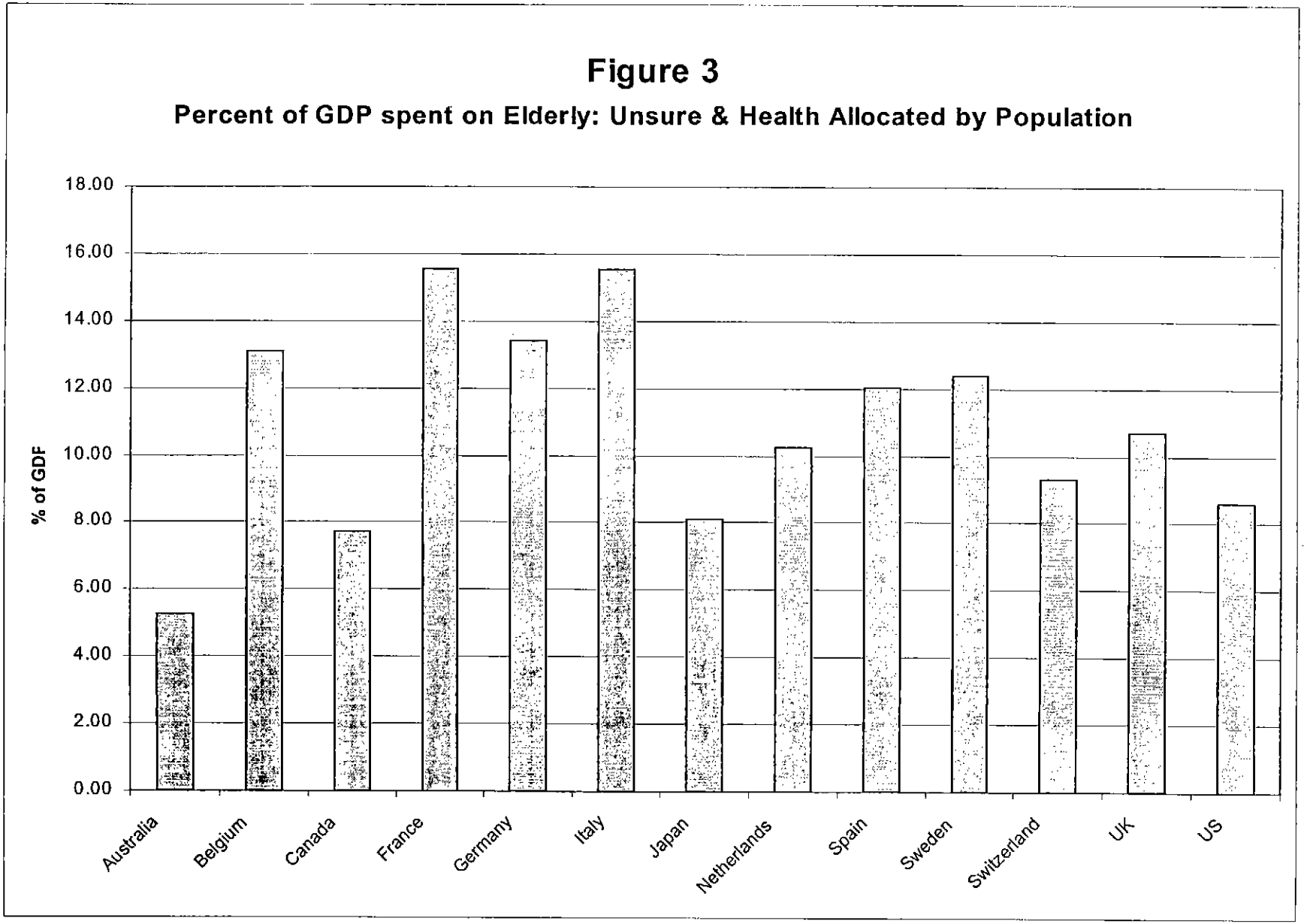


Figure 4

% of Social Spending That Goes to the Elderly

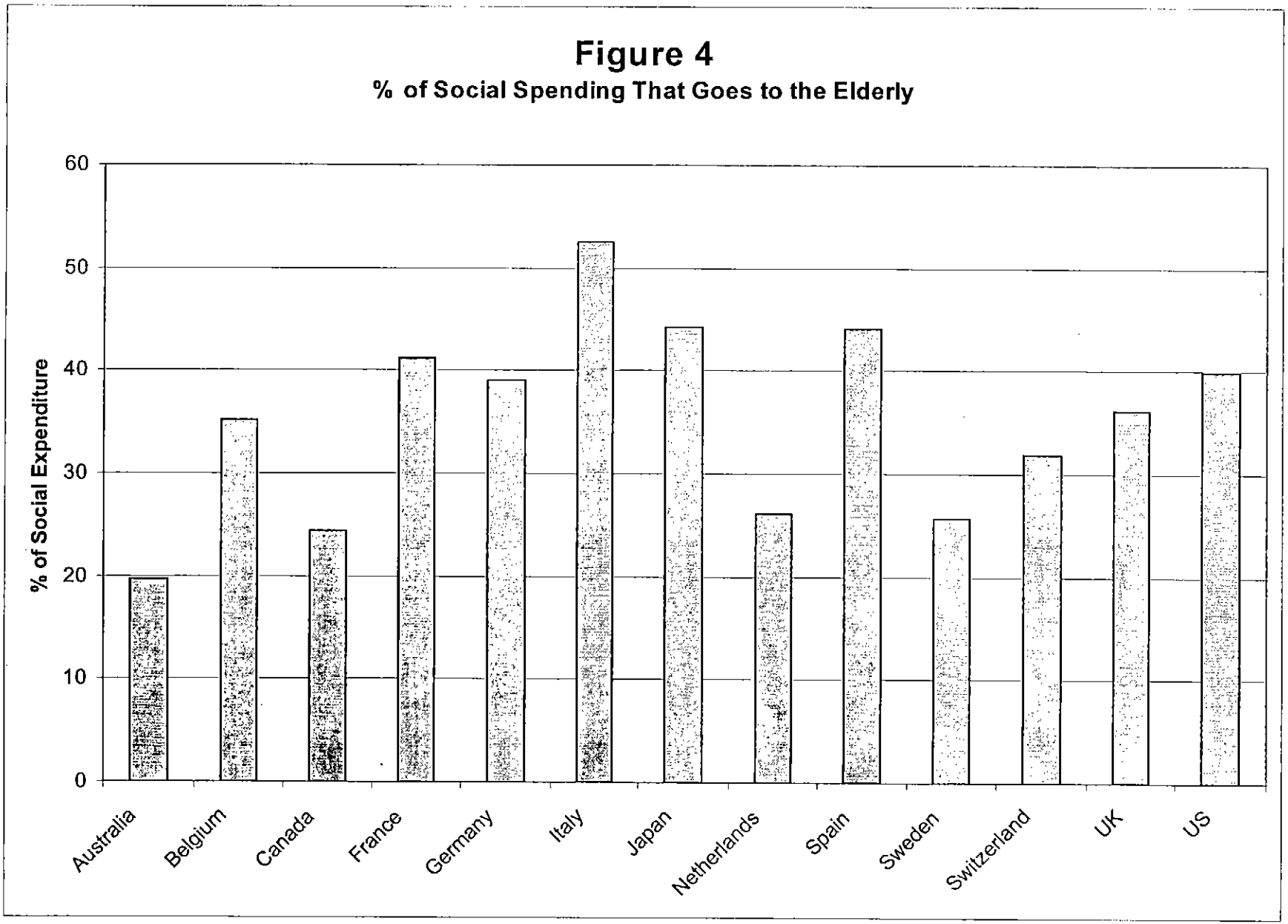
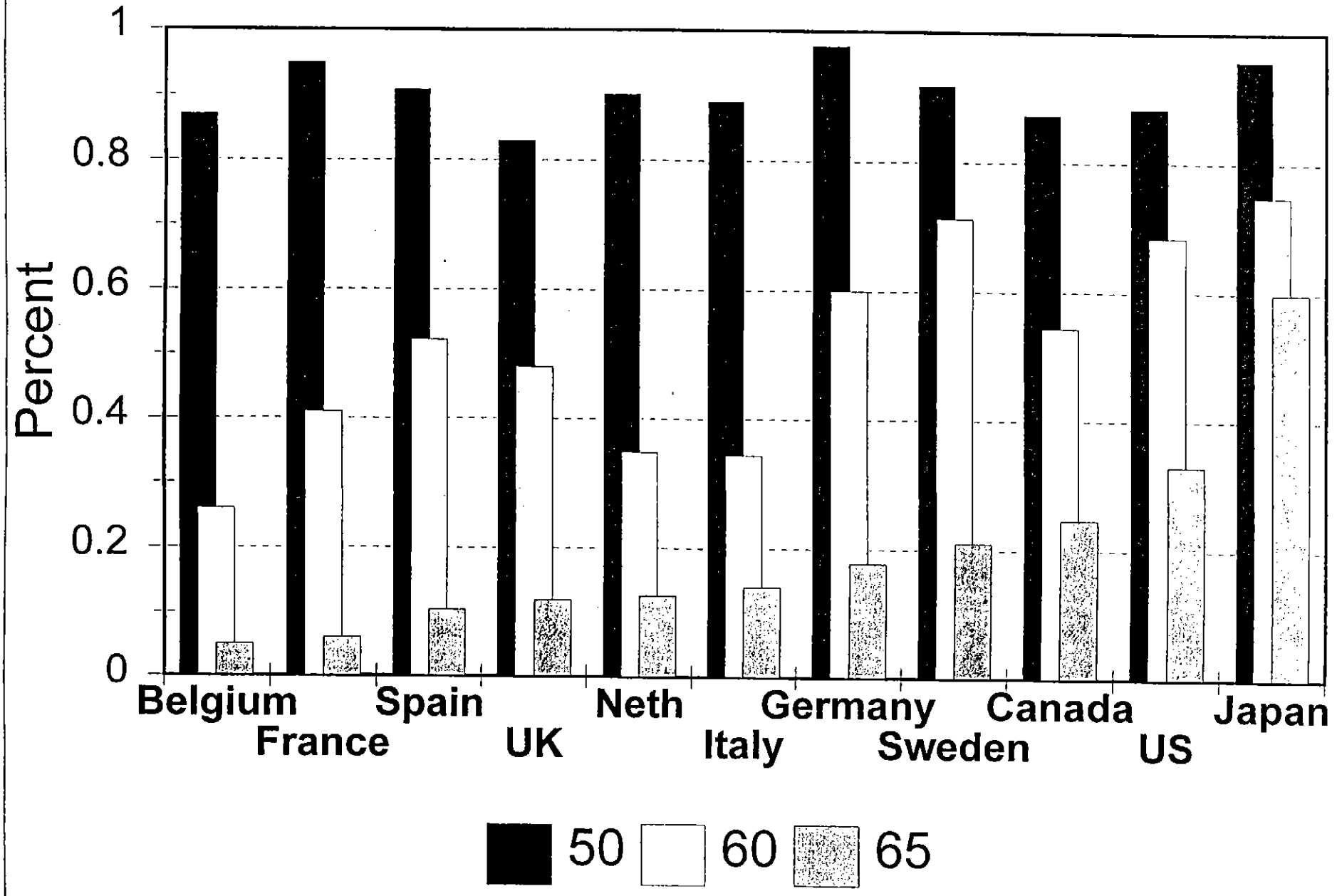
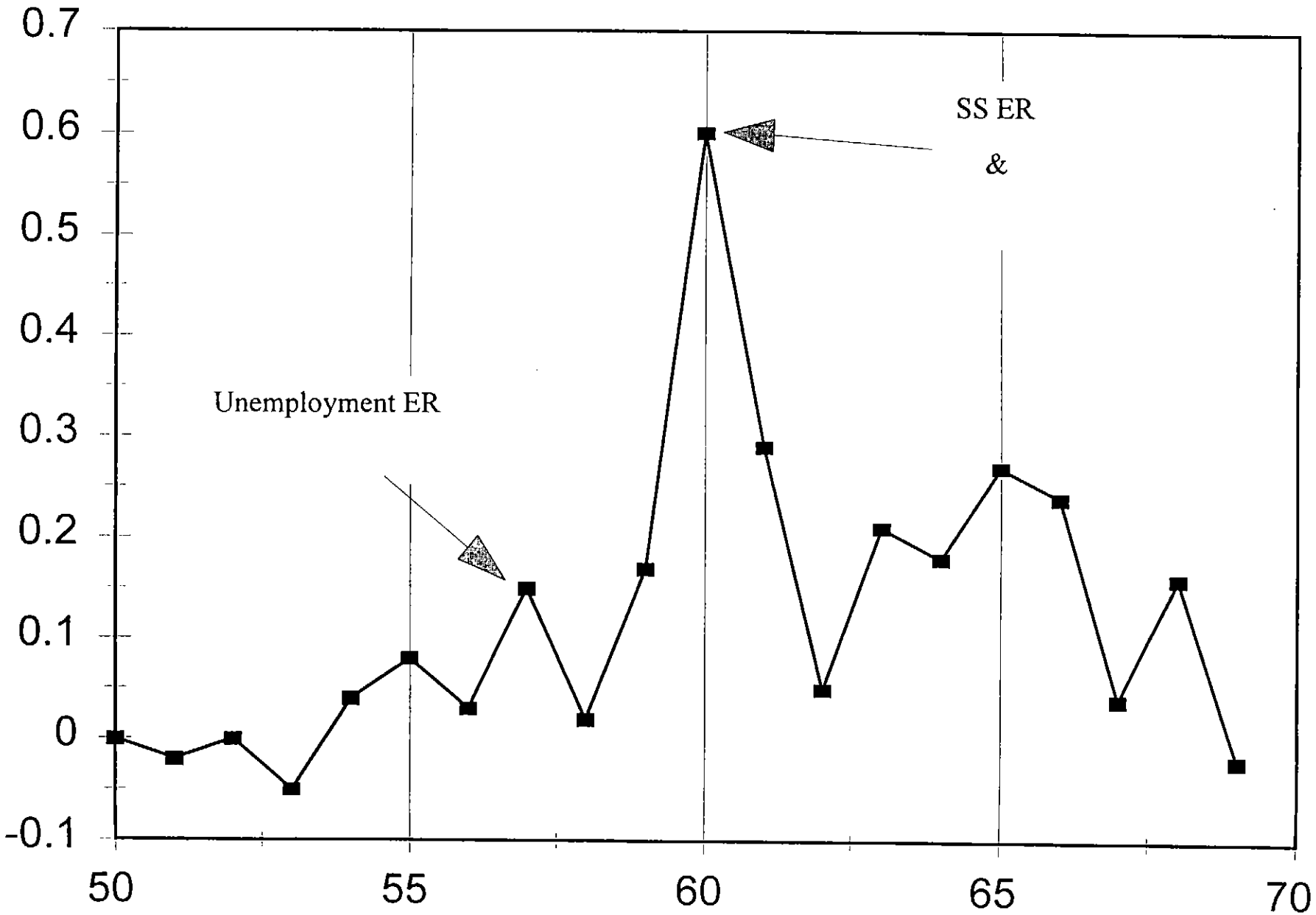


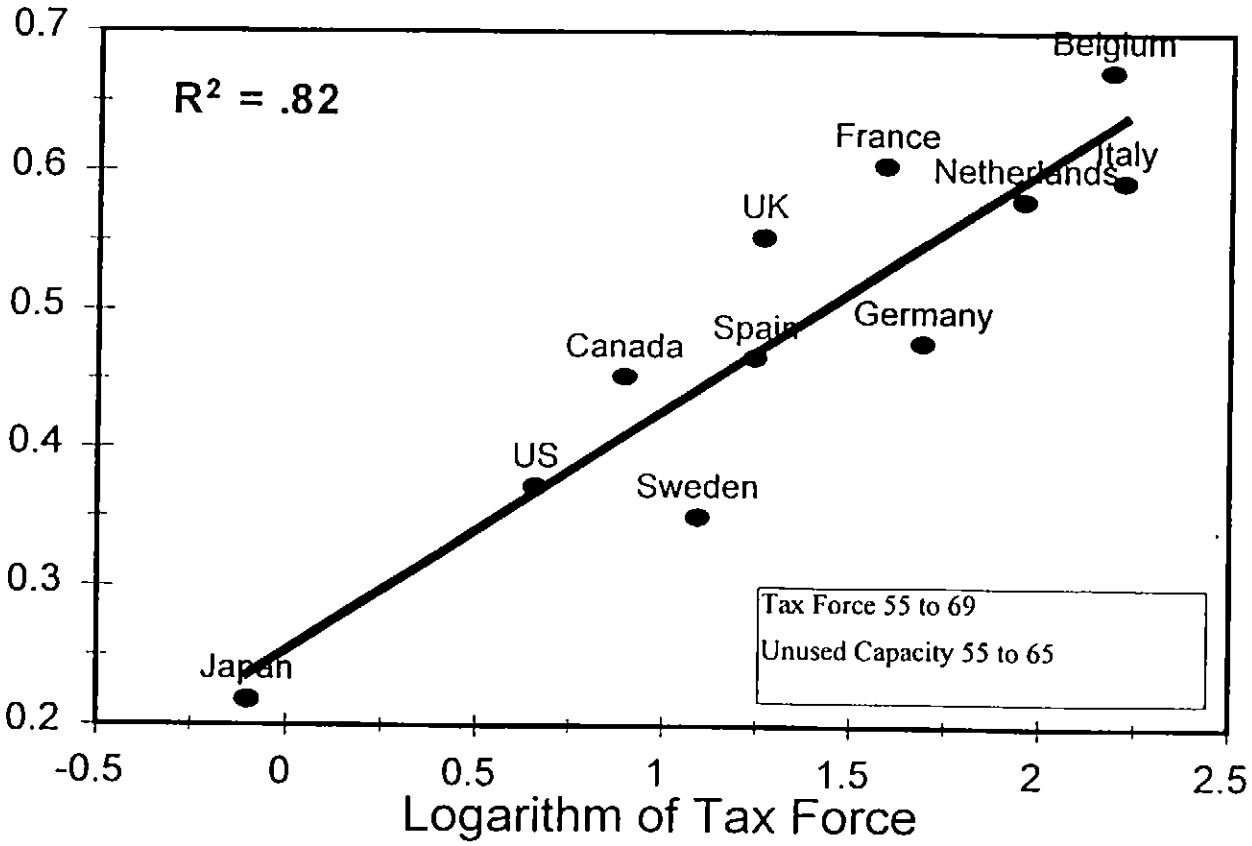
Figure 5. LFP by Country and Age



F 6. Hazard Rates for France



F 7. Non Work Vs. Tax Force



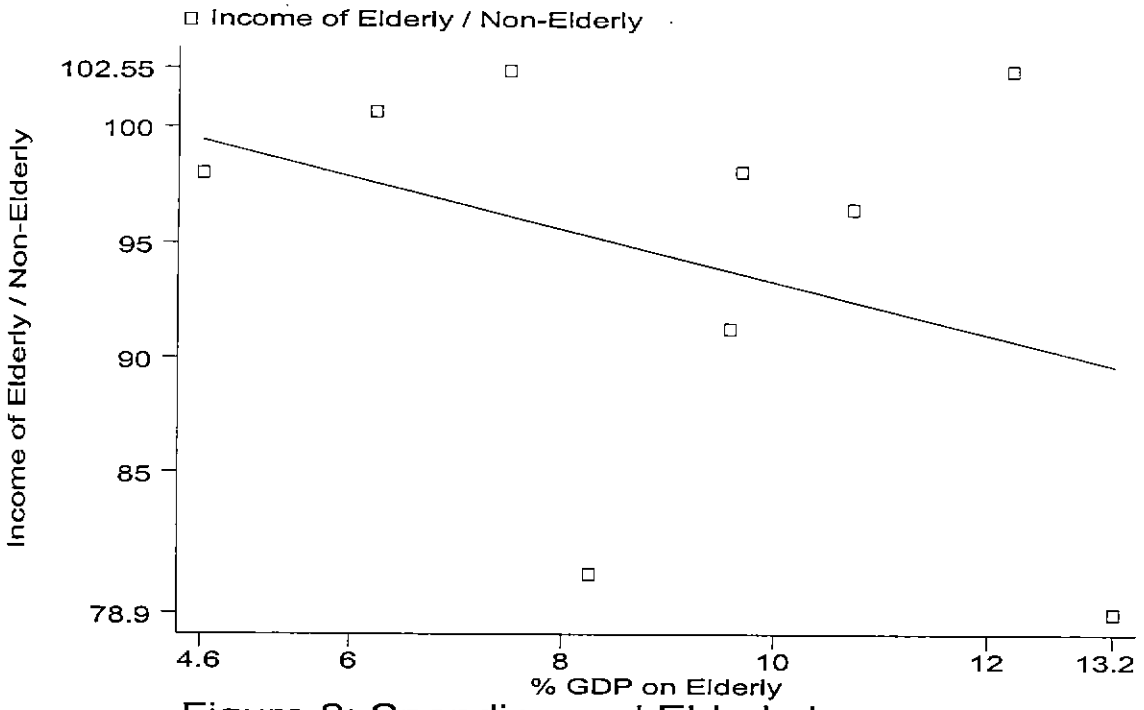


Figure 8: Spending and Elderly Incomes

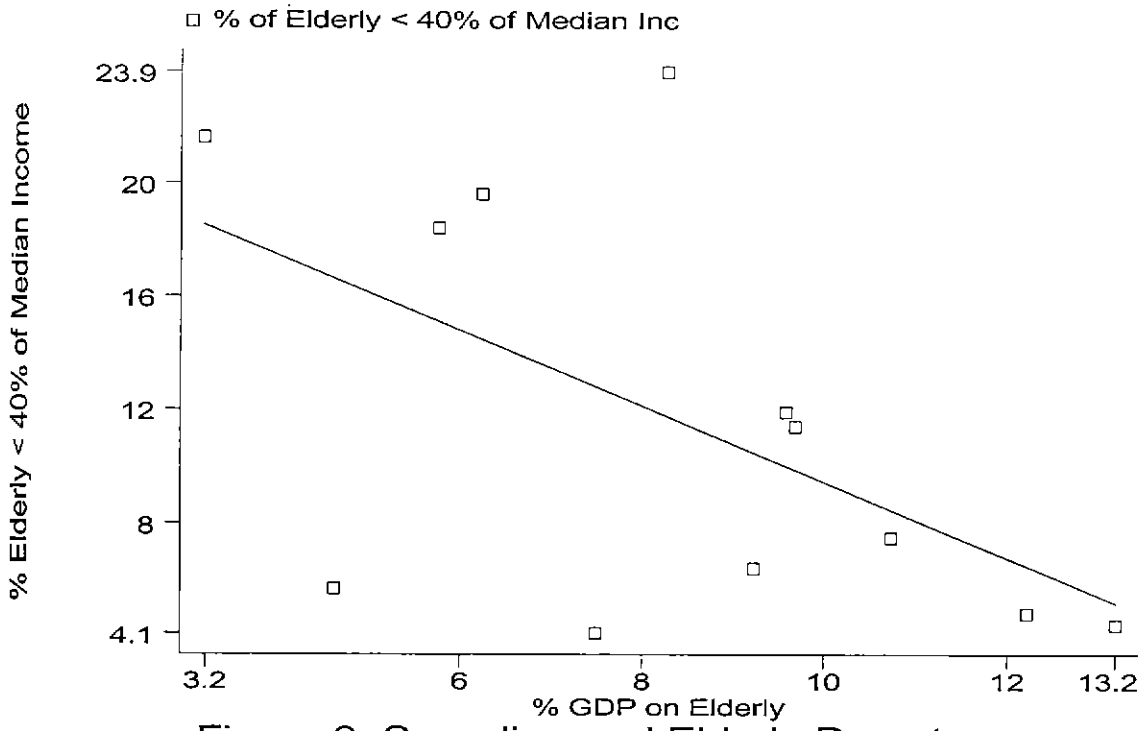


Figure 9: Spending and Elderly Poverty