Determinants of the Growth in the Social Security Administration's Disability Programs—An Overview

by Kalman Rupp and David Stapleton*

This article examines factors affecting the growth in the Social Security Administration's disability programs. We synthesize recent empirical evidence on factors affecting trends in applications and awards for Disability Insurance and Supplemental Security Income (SSI) benefits and duration on the rolls. Econometric analyses of pooled time-series, cross-sectional data for States provide strong evidence of business cycle effects on applications and, to a lesser extent, on awards. Substantial effects of cutbacks in State general assistance programs are also found, especially for SSI. Estimated effects of the aging of the baby boomers, growth in the share of women who are disability insured, the AIDS epidemic, and changes in family structure are also presented. Indirect evidence suggests the importance of programmatic factors, especially for awards, and especially in the mental and musculoskeletal impairment categories. The decline in the average age of new awardees has substantially increased duration, particularly for SSI. As a result, caseload growth would be expected to continue even in the absence of future award growth.

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The Federal Government provides cash benefits for persons with severe disabilities through two Social Security Administration (SSA) programs—the Social Security Disability Insurance (DI) program under Title II of the Social Security Act, and the Supplemental Security Income (SSI) program under Title XVI. Both programs use the same definition of disability, but other eligibility criteria differ. In particular, DI is a social insurance program with disabled-worker eligibility based on prior Social Security covered employment. Prior work experience is not required under SSI, but the program is means tested, using income and asset eligibility criteria. Some persons may be eligible under both programs and receive DI and SSI benefits concurrently. DI benefits stop when a DI beneficiary reaches age 65 and he or she is transferred to the Old-Age and Survivors Insurance program (OASI). SSI disability recipients may continue to receive benefits past age 65, if they continue to meet the income and asset tests. Children with qualifying disabilities are eligible for SSI payments on their own right subject to income and eligibility requirements.

About 20 years ago a series of econometric studies, primarily using aggregate time series techniques (Lando 1974; Hambor 1975; Thompson and Van de Water 1975), were conducted, focusing on the effects of the business cycle on the growth of the DI program. This heightened interest coincided with a peak in the number of new awards in 1975 (chart 1). SSA actuaries continued to monitor the growth of the DI program on an ongoing basis, focusing on demographic and legislative changes that shape program growth. Academic interest in the DI and SSI programs waned during the late 1970's and early 1980's, as applications and awards started to decline, but the recent growth in both programs refocused attention on them. The upsurge was particularly notable in the number of children on the SSI disability rolls.

A better understanding of the factors affecting program growth is necessary to improve our ability to make predictions about future growth both in the short and long run. The number of applications has a direct effect on SSA's administrative costs and ability to process applications in

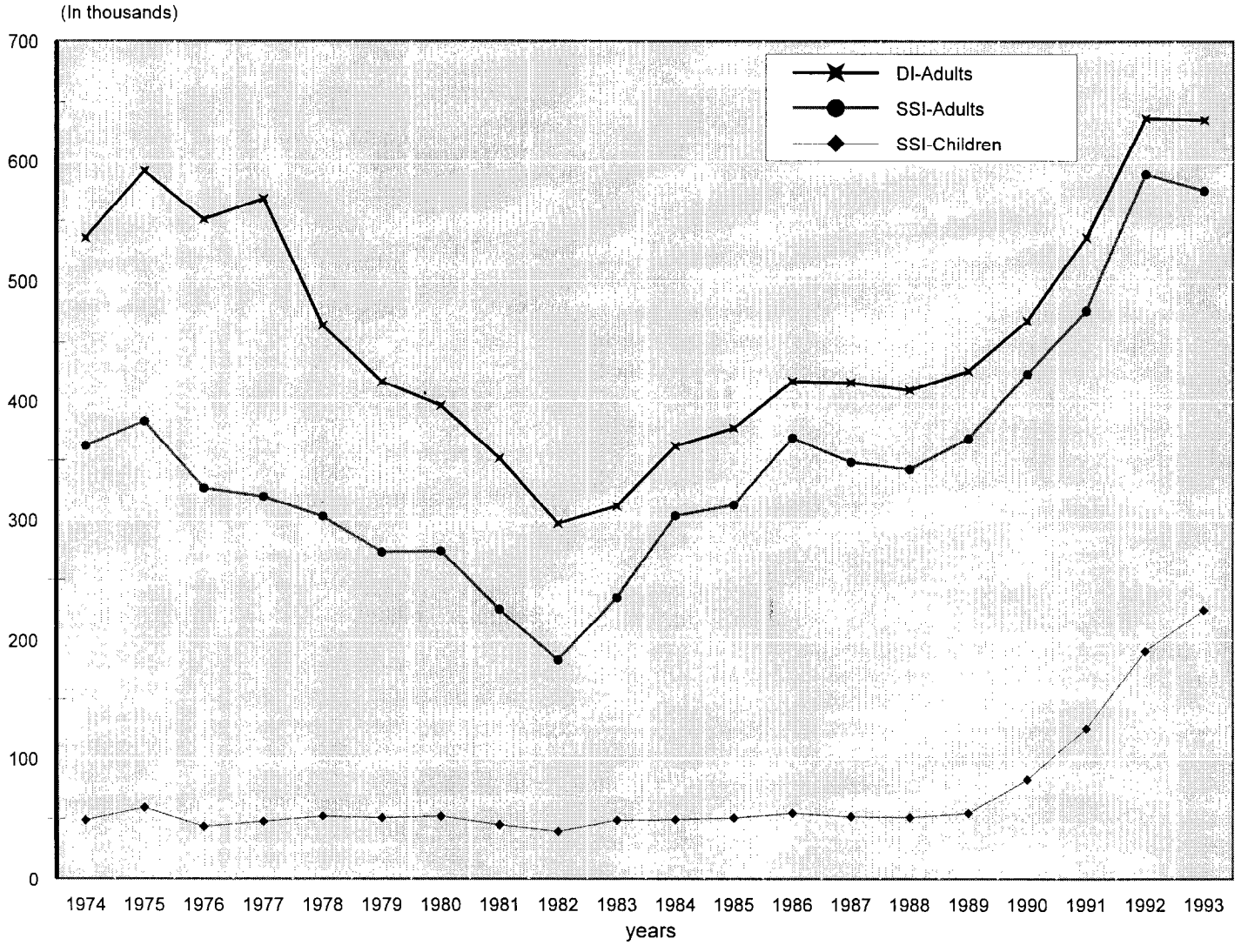
a timely fashion, while the number of new awards and length of stay determine caseload growth and program cost. SSA prepared a report (Department of Health and Human Services (DHHS) 1992) summarizing existing knowledge about the growth of the DI program and providing a comprehensive list of various demographic, economic, and programmatic factors hypothesized to affect caseload growth. After receiving the 1992 report, the Board of Trustees of the Federal OASI and DI Trust Funds recommended that SSA initiate a research effort to establish whether the growth represents a temporary phenomenon or a longer-term trend. In response to this recommendation, and in cooperation with the Office of the Assistant Secretary for Planning and Evaluation at DHHS, SSA initiated a series of research projects conducted through a combination of in-house analyses and several contracts with Lewin-VHI, focusing on application and award growth to produce an assessment of the reasons for disability program growth.

This additional research was needed to assess the causal role of various factors and to quantify their effects. In particular, it was important to assess whether various factors are primarily responsible for short term temporary or cyclical changes in caseload growth or for permanent changes. To improve future projections, it is also important to identify factors unaccounted for or improperly included in previous models. Improved knowledge about caseload growth might also facilitate useful policy interventions related to particular factors, the identification of programmatic options to control future growth, and the improvement of the incentives associated with disability programs. This article summarizes what we currently know about the factors affecting caseload growth. Our summary is primarily based on the results of quantitative analyses of factors affecting applications, awards, and duration on the rolls, but we also rely on the results of other relevant studies.[1]

Overall Conceptual Framework

Caseload growth is affected by both economic and noneconomic factors. Factors such as the value of potential cash benefits relative to wages, the value of complementary or substitute program benefits, and business conditions are

Chart 1.—DI and SSI disability awards, 1974-93



clearly in the domain of economics. Demographic and epidemiological factors, as well as the criteria for determining disability status and their implementation are, at least in a proximate sense, noneconomic factors that might affect caseload growth, often substantially. The economic perspective, emphasizing the role of opportunity costs—individuals making choices comparing various alternatives—is particularly useful in understanding how economic and noneconomic forces interact in shaping decisions such as applying for and being awarded disability benefits, as well as decisions concerning leaving the disability rolls.

From the economic perspective, program participation is an outcome of the interaction of the "demand" for program benefits by individuals and the "supply" of program benefits by the Government. On the demand side, the number of applications (representing the demand for awards) in part depends on:

- the relative advantages of working and not working;
- the availability of substitute forms of public assistance (such as Aid to Families with Dependent Children (AFDC) and general assistance (GA));
- complementary benefits provided to those receiving disability benefits—especially health insurance benefits (Medicare for DI beneficiaries and Medicaid for SSI recipients); and
- various features of the DI and SSI programs—that is, the costs of applying for benefits, the probability of receiving an award, and how long benefits are expected to continue.

Once persons with disabilities begin receiving DI and/or SSI benefits, their continued "demand" for benefits is influenced by:

- the length of time already on the rolls—over time, a beneficiary's potential earnings decline as continued separation from the labor force erodes working skills;
- programmatic disincentives to work—with limited exceptions, DI and SSI beneficiaries who engage in "substantial gainful activity" (that is, those earning over $500 per month) subsequent to a 9-month trial work period lose all their disability benefits;[2]
- changes in their health and disability status; and
- changes in the labor market.

"Supply" side factors affecting application for disability benefits include legislative factors, as well as administrative procedures, judicial rulings, and the resources available for making award decisions. The "supply" side for those on the rolls is affected by:

- the number of "Continuing Disability Reviews" (CDRs)—to determine if current beneficiaries still meet the disability standard (with benefit termination for those who do not); the number of CDRs conducted depends both on the availability of administrative resources and the "political will" to conduct these often unpopular reviews;
- changes in rules concerning the effects of work on program eligibility and benefits, especially for the SSI program; and
- the availability of vocational rehabilitation programs and incentives and requirements to use them.

While factors affecting initial awards and length of stay can be seen as sequential, changes at the "back end" of the process have potential feedback effects as well. For example, anticipated reconsideration and administrative law judge (ALJ) decisions may affect initial eligibility determination decisions by the State Disability Determination Services (DDS), as well as applicant decisions to ask for the reconsideration of unfavorable decisions and to exercise their appeal rights. The perceived "strictness" of the disability determination process might also affect applications. In addition, perceptions about SSA's termination and suspension policies might affect work activities, and therefore continued eligibility, among beneficiaries.

Although the economic perspective focuses on choices made by individuals given their available opportunities, it must also be recognized that third parties often have a significant interest in this choice and may actively try to influence it. An important example is State and local governments who have an interest in shifting the costs of welfare and health expenditures to the Federal Government. Other interested third parties include employers, health care providers, and private insurers.

In the next section, we focus on factors affecting applications and awards. In the section following it, we address the factors affecting length of stay, suspensions and terminations, as well as the effect of length of stay on caseloads. In the final section, we briefly discuss implications and directions for future research.

Applications and Awards

This section provides an overview of the factors affecting applications and awards. Applications have a major effect on SSA's administrative costs, while the number and characteristics of new awardees fundamentally shapes future program cost. First, we discuss population factors and trends affecting the target populations of the DI and SSI programs. Subsequently, we address the business cycle and economic restructuring, the availability and value of other benefits, and programmatic factors affecting applications and awards.

Methodology

Much of the following discussion is based on the findings from a State-level econometric analysis of applications and awards for the 1988-92 period and from a followup analysis for 1980-93. The dependent variable of interest in these analyses is the volume of applications and awards at the State level; the independent variables were designed to capture relevant factors affecting these State-level aggregates.

For the first of the econometric analyses, SSA prepared tabulations of applications and awards at the State level for the 1988-92 period from its new Disability Research File (DRF), aggregated by

program, sex, age, and impairment category. These data became the core of our 1988-92 database, to which we added data for various State-level explanatory variables for the same period (Stapleton, Coleman, and Dietrich 1995). For the followup analysis, we used previously existing State-level tabulations of initial (medical) determinations and initial allowance rates, disaggregated by program only, along with explanatory variable data for the 1980-93 period (Stapleton and Dietrich 1995).

For both analyses, we applied a methodology to the analysis of application and award growth that had not been previously used for that purpose—one that "pools" time-series data for a cross section of individual States. The methodology provides estimates of the effects of various factors on applications and awards that are based on the relationship across States between *changes* in the factors and *changes* in applications and awards.[3] An important advantage of this approach is that it controls for changes in national factors, such as disability program rules and policy, to the extent that they have a common influence on applications and awards in all States, as well as for permanent differences across States. Conversely, an important limitation of the methodology is that it cannot be used to estimate the effects of factors for which changes did not vary across States during this period, or that are not accurately measured at the State level. Therefore, we supplement this econometric analysis with actuarial analyses and other pieces of evidence.

For the 1988-92 analysis, we estimated 40 application and 40 award equations for each program. The dependent variable in each equation is the logarithm of either an application or incidence rate for a specific age/sex/impairment group (five age categories, two sex categories, and four impairment categories—mental disorders, musculoskeletal disorders, infectious diseases, and all others). The independent variables in each equation refer to a single State-level measure, and do not reflect disaggregated information specific to a given age/sex/impairment group. Below is an overview of the independent variables used and their hypothesized effects:

- The State unemployment rate is utilized to represent the business cycle. We hypothesize that increases in the rate of unemployment have positive effects on the volume of applications and awards, while decreases have negative effects.
- The GA program cuts variable is a proxy for the effects of State budgetary pressures on the generosity of State-funded substitute programs (especially for SSI). We hypothesize that State cutbacks in State funded substitute programs positively affect disability applications and awards. Conversely, increased generosity and access to State funded substitute programs is expected to have a negative effect on disability applications and awards. Specifically, we hypothesize that cutbacks and the elimination of GA programs in selected States increased disability program growth, and that this effect is stronger for the means-tested SSI program than for the DI program.
- An AIDS/HIV incidence variable accounts for the effects of the AIDS epidemic on the incidence and prevalence of disability. We hypothesize that the increasing incidence of AIDS/HIV has a positive effect on disability applications and awards.
- A variable measuring the number of immigrants granted legal alien status under the Immigration Reform and Control Act (IRCA) to represent the effects of the law. Unlike most other immigrants, those granted legal alien status under IRCA were immediately eligible for SSI. We hypothesize that the number of immigrants granted legal alien status positively affects the volume of SSI applications and awards.
- The percentage of children living in one-parent families as a proxy for the effects of the proportion of households headed by single parents on applications and awards (particularly for SSI). We hypothesize that the proportion of households headed by single parents positively affects SSI applications and awards.
- A dummy variable for each year to control for national factors.

The operational definitions and sources of each of the variables used in these analyses are detailed in Lewin-VHI (1995a). For DI, we also estimated separate equations for those who applied for just DI (DI-only) and for those who had applied for SSI and DI concurrently.[4] Individuals who apply for both programs are of special interest for two important reasons. First, they are the fastest growing group. Second, as will be discussed in more detail later, the majority of those who receive SSI awards are relatively short stayers on the SSI rolls because they can no longer pass the SSI means test once their 5-month waiting period for DI benefits expires and they begin receiving such benefits.

For the 1980-93 analysis, we estimated a single initial determination and allowance rate equation for each of three program groups: DI-only, SSI-only, and concurrent.[5] The SSI-only data includes child initial determinations, which is problematic because of the exceptionally large growth in child applications from 1990 on. The dependent variable in each equation is the logarithm of either initial determinations per capita or the initial allowance rate (initial allowances divided by initial determinations). The explanatory variables that follow include those from the 1988-92 analysis that were available for the full period, plus several others that represent overall State-level values:

- The expected application rate variable is based on 1990 national application rates by age group and the age distribution of the State's population in the current year—to capture the effect of the aging of the population. This variable is equal to a weighted average of age-specific national application rates for 1990, with the weight for each age group equal to the share of the State's working-age population in the age category. We hypothesize that the expected application rate variable

positively affects initial determinations and allowances.

- The labor-force participation rate variable captures the negative, cyclical effect of discouraged workers leaving the labor force during recessions. We hypothesize that declines in labor-force participation are positively associated with initial determinations and awards. However, for DI, the labor-force participation rate variable may also capture the long-term positive effect of growth in the share of women who are disability insured.
- The share of employment in manufacturing variable is a proxy for the effect of economic restructuring. In the short run we anticipate a positive relationship between changes in the share of manufacturing employment and initial determinations and allowances as a result of job losses associated with decreases in manufacturing employment. However, in the longer term an opposite effect can be hypothesized reflecting the long-term shift to service sector jobs that tend to be associated with a lower incidence of work disabilities.
- The incidence rate of the disabling work injuries variable captures changes in the nature of work. We hypothesize a positive effect on initial determinations and allowances.
- The poverty rate variable captures changes in poverty that are not picked up by other variables in the model. We hypothesize a positive relationship between the poverty rate and SSI initial determinations and allowances.
- The mean AFDC payment for a two-person household relative to mean earnings captures the relative attractiveness of AFDC benefits. We hypothesize a negative effect on SSI initial determinations and allowances.
- The mean SSI payment including State supplement payments, relative to mean earnings, captures the relative value of SSI benefits. We hypothesize that the relative value of SSI payments positively affects initial determinations and allowances.

When feasible, we adjusted the explanatory variables for changes in the age distribution of the population. For a more detailed discussion, see Stapleton and Dietrich (1995).

For the 1988-92 analysis we related current-year changes in explanatory variables to current changes in application and incidence rates. For the 1980-93 analysis, we also examined the effect of prior year ("lagged") changes in the explanatory variables on current year initial determinations and allowance rates and found substantial impacts for two variables: the unemployment rate and the labor-force participation rate. A technical description of the econometric methodology appears in the appendix, along with selected regression and simulation results.

In order to better design, interpret, and validate the econometric analysis, we conducted a substantial review of relevant literature, interviewed a series of government and academic experts on disability, and conducted case studies of application and award growth in five States. The States selected for the case studies include the four largest States—California, Florida, New York, and Texas—and Michigan—a State that terminated its general assistance program in 1991. We visited each State, during which we interviewed officials in SSA field offices, State Disability Determination Services, State and local welfare agencies, and other agencies. Following the site visits, we analyzed program growth in each State using the econometric models. In addition, survey data for Michigan GA recipients that had been matched to SSI administrative records were analyzed (Bound, Kossoudji, and Ricart-Moes 1995).[6]

The next sections summarize the evidence concerning the effects of population factors, the business cycle, economic restructuring, other support programs, and features of the disability programs themselves.

Population Factors

In the sections that follow we will examine the areas of population growth and target populations.

Population growth.—Changes in the size and age/gender composition of the population provide the simplest and most direct explanation of changes in the number of DI and SSI applications and awards. The size of the working-age "SSA area" population grew steadily from 1975 to 1992, and is expected to continue growing steadily in the near future. (The "SSA area" population refers to residents of the 50 States and the District of Columbia adjusted for net census undercount; civilian residents of Puerto Rico, the Virgin Islands, Guam, and American Samoa; Federal civilian employees and persons in the Armed Forces abroad and their dependents; crew members of merchant vessels, and all other U.S. citizens abroad.)

The baby boom generation, born between 1946 and 1964, was still entering the working-age population in 1975. As it did, the average age of the working-age population declined, but this decline was eventually reversed as the generation aged. Both the growth in the size of the working-age population and the aging of the baby boom generation have contributed to recent growth in applications and awards for SSA's disability programs.

The SSA area population between ages 15 and 64 grew at an average annual rate of 1.1 percent from 1975 to 1992, but the growth in recent years has been much slower than in earlier years. From 1975 to 1980 the average annual growth rate was 1.5 percent, while it was only 0.6 percent from 1988 to 1992. During the later period, however, changes in the age distribution of the working-age population substantially offset the effect of the slowing of population growth. There is a strong positive association between age and the incidence of disabling conditions. The entry of the baby boom generation initially resulted in a decline in the average age of the SSA area population, but with the aging of the baby boom generation this decline has reversed. Consequently, changes in the age distribution had a strong negative effect on application and award rates during the early part of the 1975-92 period, thereby moderating the effect of the increasing size of the SSA area population, but, for the 1988-92 period, aging of the population added

to the effect of population growth. Based on 1988 age-specific application rates and population growth by age from 1988 to 1992, we estimate[7] that population growth and aging together account for average annual DI application growth of 1.3 percentage points and SSI application growth of 1.2 percentage points[8]—both more than twice the average annual growth rate of the working-age population. Results for awards are almost identical.

Population growth during the 1975-92 period did not explain increased SSI applications and awards for children. Actually, from 1975 to 1988 the number of persons 18 years and younger declined by 2.1 percent. While the number of children increased by 4.8 percent from 1988 to 1992 (an annual growth rate of 1.2 percent), this growth is dwarfed by the explosion of SSI applications and awards among children for this period of time.

Target populations.—The number of DI and SSI applications and awards should be influenced by changes in the size of the population eligible for either or both programs, that is, each program's target population. The most important eligibility factors are the presence of qualifying disabilities and economic eligibility. The disability criteria are identical for the two programs; economic eligibility is tied to disability-insured status for DI and to a means test for SSI. All three of these criteria are influenced by factors external to the DI and SSI programs, as well as by legislative, administrative, and judicial factors. Our focus here is on exogenous changes in the size of the target populations.

To be eligible for DI, a person has to satisfy the insured status and disability requirements. SSI eligibility requires meeting the means test and the disability requirement. Persons with qualifying disabilities who are disability insured but do not meet the means test are eligible for DI only; those who are disability insured and meet the SSI means test qualify for both programs (concurrent eligibility); and those who meet the SSI means test but are not disability insured are eligible for SSI only.

Unfortunately, based on currently available data we cannot observe time series on the three main target populations directly, and indeed, not even cross-sectional data are available in which the population satisfying the disability criteria in the general population is identified.[9] Therefore, we must rely on an item by item examination of evidence on trends in these three target populations.

The share of the DI-insured population grew at an average annual rate of 1.2 percent from 1975 to 1992. The rate of growth was much higher for women (2.6 percent) than for men (0.2 percent), reflecting the increase of female labor-force participation rates (chart 2). The narrowing of gender differences also suggests that this source of increased growth is approaching exhaustion.

Actuarial analysis of the contribution of changes in the size and the age/gender composition of the disability insured population to the growth of DI applications from 1988 to 1992 found an average annual contribution of 2.1 percentage points—0.8 percentage points greater than the estimated impact of population growth and aging alone—with almost all of the added contribution due to changes in the disability insured status of women (Lewin-VHI 1995a). Results for awards were almost identical. Importantly, the growth in the proportion of the disability insured population suggests an increase in the share of SSI eligibles concurrently qualifying for DI, thereby depressing the growth of the SSI-only group, particularly for women.

To proxy for trends in the population that is economically eligible for SSI, we examined changes in the poverty population for working-age adults and children between 1975 and 1992. During the late 1960's and early 1970's, Nobel Laureate James Tobin and Robert Lampman optimistically predicted the elimination of poverty by 1980. However, between 1975 and 1992 the size of the working-age poverty population after government transfers increased from 11.5 million to 18.3 million, increasing the working-age poverty rate to 9.4 percent for males and 13.9 percent for females.

Pre-transfer poverty is of more relevance for assessing the impact of poverty on SSI eligibility, but consistent measures are not available before 1979. From 1979 to 1992, the pretransfer poverty rate for the working-age population grew at an average annual rate of 1.6 percent. Growth was highest for persons aged 18-24 and in the subperiods 1979-83 and 1989-92 (chart 3), both periods of slow economic growth or even decline; in the latter period, the average annual growth rate of the pre-transfer poverty rate was 3.5 percent. Assuming that increases in the poverty rate directly translate into increases in SSI applications on top of the effects of population growth and aging, these factors combined account for 4.7 percentage points of the average annual growth in SSI applications over this period, or about 45 percent of the average annual growth of 10.5 percent.

The pre-transfer poverty rate for children also grew substantially during the 1979-92 period, and, as with the adult rate, growth was greatest in the first and last few years of the period. For the 1988-92 period, the child poverty rate grew at an average annual rate of 2.9 percent. While this growth is substantial, it can account for only a very small fraction of the 44 percent average annual growth in child SSI applications over the period.

Although trends in poverty are particularly important proximate determinants of SSI growth, these trends may reflect a variety of underlying reasons affecting the size of the financially eligible population that are of interest in their own right. Ideally, we would like to know how various factors that are behind the growth in poverty—changes in the economy and in family structure—affect program participation. It should also be kept in mind that poverty rates may be imperfectly correlated with the percentage of the population that satisfies the SSI means test.

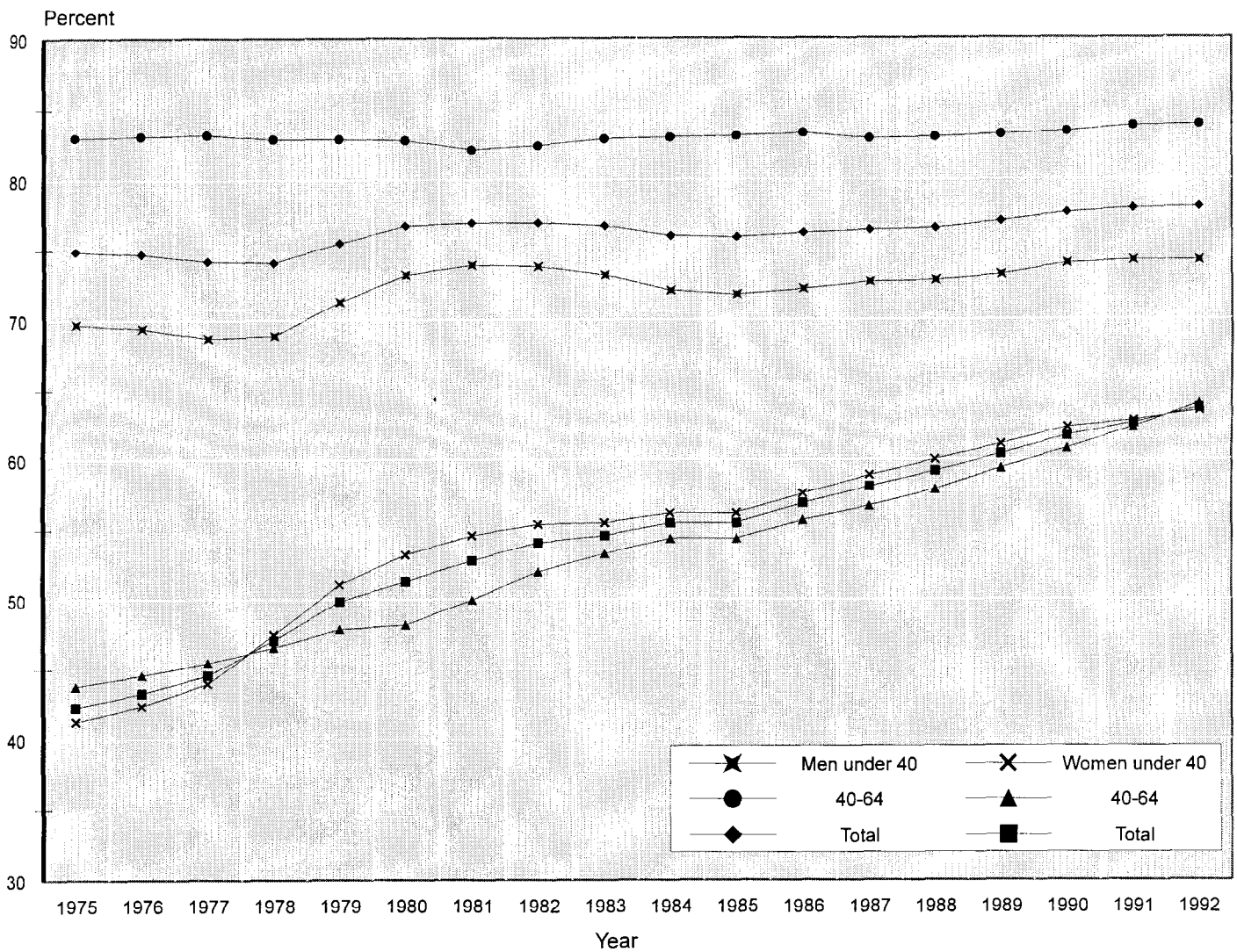
We included the poverty rate as an explanatory variable in our DI-concurrent and SSI regressions for 1988-92, but found that it did not have a statistically significant effect on applications and awards. A similar finding was obtained in the 1980-93 analysis of initial determinations. Although marginally significant, positive coefficients were obtained when

data for the 1980-87 subperiod alone were used. The weak findings might be attributable to substantial measurement errors in State-level poverty rate estimates. Another explanation is that a major determinant of the poverty rate, unemployment, is included separately in all of the analyses, so only variations in the poverty rate that are not explained by the unemployment rate (or other explanatory variables) are being used to identify the impact of poverty. In addition, the inclusion of the percent of children living with only one parent as an explanatory variable in the 1988-92 analysis may also be an effective control for another important determinant of poverty—growth in the number of female-headed households. Future work on the relationship between poverty, SSI means-testing, and disability applications and awards could be further enhanced on the basis of the rich source of information provided by SSA's matched SIPP data files.

The findings with respect to the percent of children living with only one parent merit further discussion. We included this variable in the regressions as a proxy for changes in family structure—declines in marriage rates that have left many individuals with no source of support other than their own earnings. This variable accounts for a significant amount of SSI application growth as well as DI-concurrent application growth—on the order of 5.0 percent of annual growth over the 1988-92 period. Effects were somewhat larger for women than for men, were larger for younger age groups than for older age groups, and were concentrated in the mental disorders category. A negative association between severe mental illness and marriage has been documented in the mental health literature; individuals who are mentally ill are less likely to marry than others, and are more likely to get divorced if they do marry (Bartel and Taubman 1986). Our findings are consistent with the notion that declines in the availability of economic, physical, and emotional support from a spouse may be contributing to growth in applications and awards.

The data available to study the prevalence of disabling health conditions is limited, especially for analyzing trends. Long-term trends in the prevalence of disabling conditions may be influencing long-term growth in applications and awards (in some cases negatively), but

Chart 2.—Percent of the working age population that is disability insured, 1975-92



with one exception (AIDS/HIV), we did not find convincing evidence of health trends explaining the recent acceleration of application and award growth. As will be discussed later, however, expansion of the population with qualifying disabilities due to legislative and regulatory changes and increased awareness of disabling conditions might have substantially contributed to application and award growth.

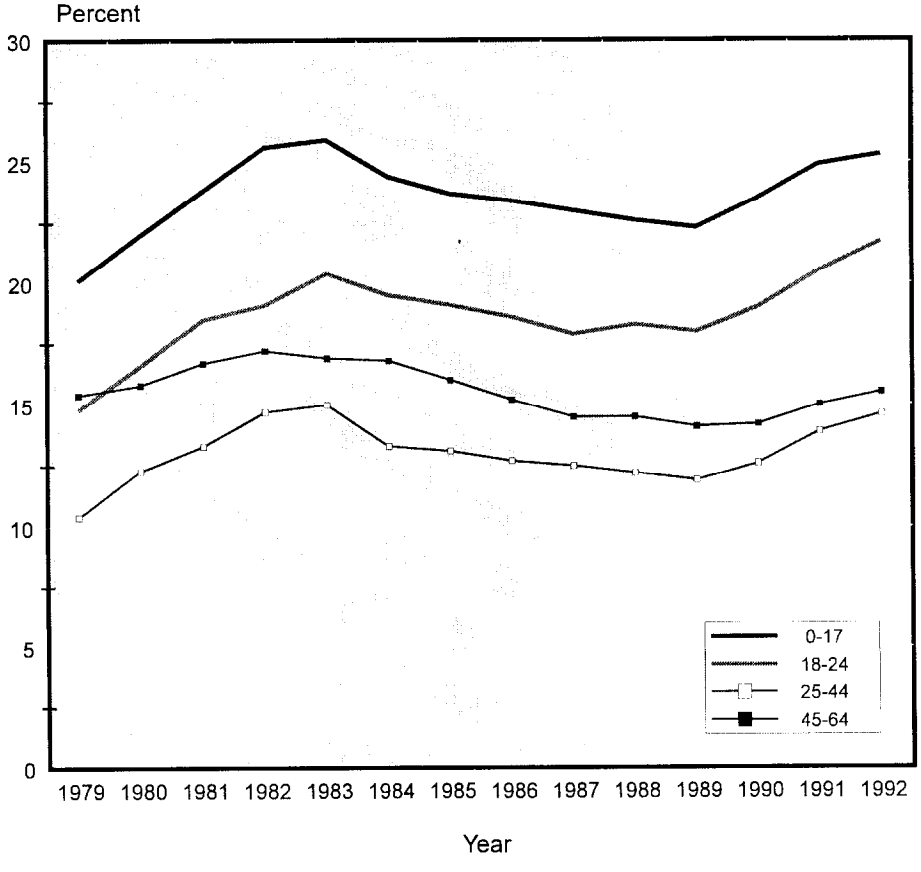
The incidence of AIDS/HIV grew at an annual rate of 9.3 percent from 1988 to 1992. Our regression estimates for 1988-92, along with counts of the number of applications in the AIDS/HIV impairment category, suggest that AIDS/HIV accounts for between 0.6 and 0.9 percentage points of both DI and SSI application growth over this period.

SSI applications from legal aliens and those living in the United States under the color of law grew much more rapidly than those from citizens—at an average annual rate of 17.4 percent from 1988 to 1992, versus 9.8 percent for citizens—although the share of all applications from the former group is still small (6.8 percent in 1992). We previously have hypothesized that the Immigration Reform and Control Act (IRCA) explained the relatively rapid growth among applications from this population. National time series data of IRCA legalizations show a striking resemblance to national time series data for SSI applications from legal aliens (Lewin-VIII 1994). Because IRCA legalizations are concentrated in a relatively few States, we expected that any impact of IRCA legalizations would be clearly distinguished in the application and award analysis for 1988-92. In fact, however, the findings were very weak. To verify the econometric findings, the number of annual SSI awards to IRCA immigrants in a 10-percent sample of all SSI applications was tabulated for the period from 1989 (the first year of IRCA legalizations) to 1994. The number identified as IRCA immigrants turned out to be very small—peaking at an estimated 3,200 of the 88,500 applications from all legal aliens in 1993. Thus, the rapid growth in legal alien applications over this period appears to be partly due to the same factors that are behind the growth in applications from citizens. Thus, IRCA is apparently not responsible for the relatively rapid growth of applications from noncitizens. In the analysis of the 1980-93 data we examined whether growth in the number of legalized immigrants who have satisfied the 3-year waiting period could explain this phenomenon, but again found no significant results. Evidence from the case studies suggests that the recession had a much larger impact on the immigrant population than on citizens, but we have not tested the hypothesis empirically. It is also known that middleman fraud has played a role in helping immigrants in some areas obtain awards, but the extent of the fraud is unknown.[10]

An important feature of our findings concerning population factors is that they explain why growth in concurrent applications has been greater than growth in applications and awards for either program alone, and especially why concurrent application and award growth has greatly exceeded that in the DI-only category. Female and young DI applicants are more likely to meet the SSI means test than are older male DI applicants, and growth in the disability insured population has been greatest for women and for the young to middle age groups. The effects of poverty and changes in family structure have roughly equal impacts on concurrent and SSI-only applications and awards, but at most have small impacts on DI-only applications and awards. Finally, the effect of AIDS/HIV on concurrent applications and awards has been substantially greater than its effects on those in either the DI-only or SSI-only categories.

Our analysis suggests that the increased size of both the disability insured and the poverty populations contributed to the growth of DI and SSI applications. Because of the substantial increase in the size of the poverty population and the dramatically increasing proportion of women who are DI-insured, the increase in the size of the target population satisfying both DI and SSI criteria appears to have grown most rapidly, explaining the preeminence of this group in both application and award growth.

Chart 3.—Percent of persons in poverty before transfer payments, by age, 1979-92



Business Cycles

There have been numerous previous econometric studies estimating the effect of the business cycle on DI applications, awards, and caseloads. Most of the previous studies used aggregate time-series methods, although some work has been conducted using State or individual level cross-sectional data (chart 4). The point estimates vary across individual studies, but no study has found substantial effects in a direction opposite from the predictions of economic theory. Previous studies have suffered from various specification problems or low statistical power, or both.

One of the key results from our work using annual pooled cross-section/time-series data for States relates to our estimates of business cycle effects, because our ability to control for permanent differences among the States and to eliminate the confounding effect of national changes endemic to time-series studies makes the results obtained from our analysis methodologically much stronger and more credible. Strong results were found in both the 1988-92 analysis of applications and awards and the 1980-93 analysis of initial determinations and initial allowance rates (chart 4). In general, we found stronger effects for applications than awards, and for the DI program than for SSI. In the 1980-93 analysis of initial determinations we found that the impact of a change in unemployment begins in the year of the change, but is greatest 2 years after the change. Such "lagged" effects are presumably greater for initial determinations than for applications because of the substantial lag between filing and the initial determination, but nonetheless they could be very significant. We did not examine this issue in the 1988-92 application analysis.

We were able to extend our DI initial determination analysis back to 1976, and found remarkably stable unemployment effects for DI in each of three subperiods—1976-79, 1980-87, and 1988-93. We also found that unemployment effects for SSI-only initial determinations were essentially as large as for DI-only and concurrent initial determinations in the 1980-87 period, but we did not find an unemployment effect for SSI-only initial determinations in the 1988-93 period. The latter finding may be related to the fact that the SSI-only data include children.

In the initial determination analysis we also found evidence of a discouraged-worker effect; holding the unemployment rate constant, a decline in labor-force participation as individuals give up their search for work during a recession is associated with a significant increase in initial determinations.

The findings from the five case studies add credibility to the econometric findings about business cycles, suggesting, if anything, that they are conservative. It is clear from the case studies that subtleties of business cycles not captured by the unemployment rate are relevant to a recession's impact—the industrial distribution of job losses, the perceived permanence of layoffs, and key characteristics of workers who lose their jobs, such as age, gender, prior earnings, and skills. We believe that the econometric estimates of the effect of the unemployment rate do not fully account for the effects of the business cycle. First, because of errors in the measurement of the unemployment rate variable, the estimates tend to understate the effects of the unemployment rate. Second, because the unemployment rate does not fully capture important aspects of the business cycle that are expected to affect applications (for example, discouraged-worker effects), we believe that our estimates tend to provide a conservative assessment of the proportion of the application and award growth attributable to business cycle effects. The case study evidence supports this interpretation.

The business cycle findings suggest a need to search for improved programmatic responses to the business cycle. Current program incentives make it highly likely that marginally qualified applicants drawn into the program by the business cycle will provide a long-term burden for the disability rolls even if business conditions improve and the severity of the person's disabling condition(s) does not worsen.

We know relatively little about the mechanisms through which business cycles affect program growth. We cannot determine, for instance, the extent to which our results reflect the effects of State and local fiscal responses to recessions rather than applications by workers with serious disabilities who lose their jobs or whose spouses lose their jobs. The smaller estimated business cycle effects for SSI-only applications and awards—in comparison to the DI findings—is consistent with the hypothesis that much of the DI effect is due to job losses by workers with disabilities. Findings from the case studies support this interpretation as well, but they also provide evidence of an important role for State and local fiscal responses to revenue losses, a subject we will return to later.

The dynamic aspects of business cycle impacts are also poorly understood. The considerable lagged effects found in the initial determination analysis suggest that many individuals who are induced to apply during a recession only do so after an extensive search for other sources of support.

Economic Restructuring

Many have hypothesized that economic restructuring—the replacement of high paying manufacturing jobs with relatively low paying service sector jobs—has had an impact on application and award growth. The short-term effect of economic restructuring is thought to increase applications, because disabled workers who lose their manufacturing jobs may choose to apply for disability benefits rather than find new work in the service sector. The long-term effect may be to decrease applications, however, because service sector workers are less susceptible to disabling injuries and illnesses (see Loprest, Rupp, and Sandell 1995). The long-term effect may vary by impairment group; for instance, some have suggested that the effect is negative for physical impairments but positive for mental impairments.

We previously speculated that the large business cycle effects found in the 1988-92 application analysis may partly reflect the short-term, positive impact of

Chart 4.—Estimates of the effect of a 1-percentage point increase in the unemployment rate on disability program growth for adults

Study	Data type	Period	Estimated effect of a 1- percentage point increase in unemployment	
Applications				
(Hambor, 1975)	Quarterly, national	1964-71	7% for DI	
(Lando, 1974)	Quarterly, national	1962-73	2 - 4% for DI	
(Lando, Coate, and Krauss, 1979)	Quarterly, national	1964-78	2 - 7% for DI	
(Halpern, 1979)	Quarterly, national	1964-78	Negligible for DI	
(Muller, 1982)	Annual, individual, cross-section	1972	Negligible for DI	
(Levy and Krute, 1983)	Annual, individual, cross-section	1978	Negligible for DI	
(Hambor, 1992)	Annual, national	1970-91	Negligible for DI	
(Stapleton, Coleman, and Dietrich, 1995)	Annual, pooled, cross-section/time-series	1988-92	4% for DI-only, 4% for DI-concurrent, 2% for SSI	
Initial determinations				
(Stapleton and Dietrich, 1995)	Annual, pooled cross-section/time-series (SSI-only includes children)	1980-93	DI-only	2% in year of change, 3% after 1 year, 5% after 2 years
			Con-cur-rent	2% in year of change, 4% after 1 year, 5% after 2 years
			SSI-only	0% in year of change 1% after 1 year 3% after 2 years
Awards				
(Hambor, 1975)	Quarterly, national	1964-71	2 - 4% for DI	
(Lando, 1979)	Annual, State-level cross-section	1975	5 - 6% for DI	
(Muller, 1982)	Annual, individual, cross-section	1972	Negligible for DI	
(Levy and Krute, 1983)	Annual, individual, cross-section	1978	Negligible for DI	
(Hambor, 1992)	Annual, national	1970-91	Negligible	
(Stapleton, Coleman, and Deitrich, 1995)	Annual, pooled, cross-section/time-series	1988-92	3% for DI-only, 2% for DI-concurrent, 2% for SSI	
Initial allowance rate				
(Stapleton and Dietrich, 1995)	Annual, pooled cross-section/time-series (SSI-only includes children)	1980-93	DI-only	0 points in year of change, -1 point after 1 year, -1 point after 2 years
			Con-cur-rent	0 points year of change, -1point after 1 year, -2 points after 2 years
			SSI-only	0 points year of change, -1 point after 1 year, -2 points after 2 years
Beneficiaries				
(Thompson and Van de Water, 1975)	Quarterly, national	1963-74	1% for DI	
(Cromwell et al., 1986)	Quarterly, pooled, State-level cross-section	1975-83	Negligible for SSI Medicaid enrollees	

economic restructuring (Lewin-VHI 1995b). In the 1980-93 initial determination analysis we tried to capture this effect using the percent of employment in manufacturing as an additional explanatory variable. We did find the expected negative effect for the DI-only category, but it was small and not replicated for other program categories. We also developed two indices of job-related injuries and illnesses to capture the longer-term impact of economic restructuring, but found no significant results. Although it may be that measurement and other specification errors account for the weak findings, this is also consistent with the hypothesis that business cycle effects overwhelm the effects of economic restructuring in the periods we have examined.

Other Support Programs

Just as economic theory suggests that the relative value of disability cash benefits to potential earnings affects the decision to apply, it is reasonable to expect that the availability and relative value of benefits through other programs should also affect the decision to apply. This is an important topic, particularly in light of substantial secular changes in the relative value of public benefits such as general assistance (GA—the generic term for welfare programs funded entirely by State and local governments), Aid to Families with Dependent Children (AFDC—a State/Federal program that primarily provides support for low income, single-parent households), Medicaid, and Medicare.

Other programs can be classified as either "substitutes" or "complements" for DI and/or SSI, in the economic sense of these terms. Substitute programs are those for which an expansion in the value of benefits reduces applications and awards for the SSA programs; benefit expansion for complementary programs increases applications and awards. AFDC is a clear example of a substitute program for SSI. Individuals cannot receive benefits from both programs, and if eligible for both AFDC and SSI, must choose which benefits to receive. Increases in the relative value of AFDC benefits are expected to decrease the relative attractiveness of SSI, while decreases in the relative value of AFDC benefits should have the opposite effect. Medicaid and Medicare are clearly complements of SSI and DI, respectively; most SSI recipients are automatically eligible for Medicaid, while DI beneficiaries receive Medicare coverage after a 2-year waiting period. Increases in the cash value of Medicaid and Medicare benefits increase the relative attractiveness of SSA's disability programs, and hence the demand for their benefits. Changes in eligibility rules for other programs can change the degree to which they are substitutes or complements for the SSA disability programs. For example, expansion of Medicaid to individuals who are not sufficiently poor to qualify for SSI or universal health insurance coverage would reduce or eliminate the complementarity between medical insurance and disability programs.

In our State-level analysis for the 1988-92 period, we found strong evidence of effects for State and local general assistance programs both on applications and awards. GA reductions in seven States and the District of Columbia had highly significant, positive effects on SSI applications and awards for both men and women, and on concurrent applications and awards among men. Estimated effects on applications and awards were nearly identical, and the elasticities were often large, particularly for younger men, and for applications and awards in the mental disorders category.[11] We later found similar results for initial determinations in both the 1980-87 and 1988-93 periods. For the 1980-87 period we also found evidence that both reductions in AFDC benefits and increases in State SSI supplements increased SSI initial determinations, but these findings were not replicated in the 1988-93 analysis. The lack of findings for the later period may simply reflect lack of large changes in either AFDC or State SSI supplements.

These findings are the first clear econometric evidence we are aware of demonstrating that changes in other income and in-kind transfer programs have an impact on SSI applications and awards, but the lack of previous progress in this area may just reflect the difficulty of measuring such effects and the virtual absence of serious research efforts in this area to date. One reason for the lack of previous research is a common belief that anyone who is eligible for SSI as well as either AFDC or GA would already have applied for SSI because SSI benefits are greater. As several welfare administrators and other welfare experts have told us, this reasoning neglects the fact that the SSI application and appeals process is prohibitively difficult for many who can much more readily qualify for GA or AFDC—especially those with mental disorders.

A primary objective of the case studies was to learn more about the impact of changes in State and local welfare programs on SSI applications and awards. We found that cuts in GA benefits during the 1988-92 period represent only a fraction of State and local efforts to shift welfare recipients—primarily GA recipients—onto SSI. The most dramatic example of shifting efforts from this period occurred in Michigan, which terminated its GA program and, simultaneously, launched a large, coordinated effort to help GA recipients obtain SSI awards. Interviews with State and local officials and others in Michigan as well as follow-up empirical analysis confirmed that the termination of GA, and the coordinated efforts to help former GA recipients, explain why SSI award growth in Michigan was the second highest in the nation during this period (Bound, Kossoudji, and Ricart-Moes 1995). We also found new or intensified efforts to shift GA and other welfare recipients to SSI in other case study States, and significant efforts in many other States have been reported as well (see, for instance, Bordelon 1995).

The findings from the case studies suggest that the econometric models understate the impact of the combination of GA cuts and other State and local shifting efforts. The GA cuts variable used for the analysis is a crude proxy for general State and local welfare changes and shifting efforts; we believe that its estimated coefficient probably understates the impacts of these changes because it fails to capture the effects of shifting efforts that do not involve cuts in GA benefits.

Although the findings from the case studies and econometric analysis provide much less support for the hypothesized effect of AFDC benefit changes on SSI, the AFDC findings for 1980-87, a long-term decline in the value of AFDC benefits relative to SSI benefits (from 1975 to 1992 the level of median AFDC benefits for a family of four declined by 37 percent relative to the value of Federal SSI benefits for couples) and evidence that a substantial share of AFDC mothers have disabilities (see Adler 1993) suggest that AFDC program changes have contributed to long-term SSI application and award growth. Proposed future reforms to both AFDC and GA programs could have a substantial positive impact on SSI caseloads.

We also attempted to estimate the effect of the rising value of Medicaid benefits on SSI applications and awards, but were not successful in identifying an effect. It seems likely, however, that the absence of a positive finding reflects the difficulty of measuring the value of the benefits rather than the absence of true effects. Welfare administrators and other experts generally attest to the importance of Medicaid benefits to SSI applicants, and recent research on the related topics of "continuation of coverage" mandates (Gruber and Madrian 1993), the effects of Medicaid on AFDC caseloads (Moffitt and Wolfe 1992; Congressional Budget Office 1993; and Yelowitz 1994) confirm the importance of medical benefits to labor-force and program participation decisions. Yelowitz (1995) explores the effects of Medicaid on SSI.

In the case studies, we found that the burden of health care costs on State and local governments and health care providers was a major factor behind efforts to shift GA recipients and others onto SSI. Health care expenses for indigent patients who are not Medicaid recipients are usually paid by State and local governments or, implicitly, by providers themselves. When an individual who is not Medicaid eligible obtains eligibility via SSI, the Federal Government begins to pay at least half of these expenses. State and local savings from reduced health spending may be greater than savings from reduced cash benefits. The fact that AFDC beneficiaries are also eligible for Medicaid helps explain why State and local efforts have focused on GA recipients.

Medicaid reform or general health care reform could have a significant effect on SSI caseloads. Medicaid block grants, which would result in Federal payments to States that are not tied directly to Medicaid enrollment, would significantly reduce the incentives to shift State and local welfare recipients onto SSI. Cutbacks in Medicaid benefits could also have a negative effect. Making Medicaid benefits available to persons with disabilities independently of SSI, or otherwise increasing their access to health insurance, would also be likely to reduce SSI caseload growth.

Features of SSA's Disability Programs and Other Supply Factors

Features of SSA's disability programs—such as the real value of benefits, legislative and administrative actions affecting eligibility determination, work incentive provisions, and SSA outreach activities—might substantially affect applications and awards. Other supply factors—such as judicial rulings on appealed cases—also play a role. Research on the effects of these factors is, unfortunately, extremely difficult to perform, for three reasons:

(1) there is only limited variation in the data;
(2) most changes that do occur tend to affect the whole program, so there are no natural comparison groups; and/or
(3) it is extremely difficult to disentangle the effect of programmatic factors from potential confounding factors. Nevertheless, we review here several research directions with some promise of a better understanding of the role of programmatic factors.

Previous econometric work has addressed some important programmatic factors. Most importantly, there is a considerable body of econometric work since the pioneering work of Parsons and Leonard focusing on the effect of wage replacement rates on labor-force and disability program participation. This body of econometric work has been plagued by serious identification problems, and has produced a wide range of estimates. An alternative quasi-experimental approach using rejected applicants as a comparison group (Bound 1989) raised fundamental questions about the validity of these estimates, but relies on somewhat questionable assumptions as well. In the future, potential new insights might be gained in this important area by using information on changes in the benefit formula that occurred during the seventies to identify the effects of the relative value of DI benefits.

Economic theory suggests that the expected probability of award and future benefit streams should affect applications, and, therefore, changed eligibility rules and their enforcement might be important directly in determining not only awards, but also the pool of applicants. Two pioneering studies that performed State-level analysis for the 1970's that is similar methodologically to our own analysis for later years focused on the impact of changes in initial denial rates on DI applications and labor-force participation, taking advantage of what appear to have been exogenous changes in State denial rates. Parsons (1991) estimated that a 10-percent increase in denial rates from 1977 to 1978 decreased applications by 4.5 percent from 1978 to 1980. Gruber and Kubik (1994) refined Parsons' analysis in some respects, but came to essentially similar conclusions. One limitation of both studies is that they did not control for changes in unemployment at the State level or growth and aging of the population during this period. We replicated Parsons' findings and then found that controlling for the unemployment rate and growth and aging of the population reduced the size of the estimated effect by about 50 percent. Clearly more work is needed in this important area, and the focus of econometric work should be extended to related areas, such as the effect of other important features of the disability determination process (such as processing times) on application behavior. Such studies would be particularly timely in light of current efforts to streamline the disability determination process.

Our econometric analysis of State data provides no direct evidence of program supply effects, by design. Despite the lack of any direct evidence, it is possible to make some inferences concerning the effects of supply changes indirectly. Recent growth not accounted for by the effects of factors in the models (such as demographic changes, the business cycle, GA program cuts, and so forth) represents an implicit upper bound on the net effects of supply changes on applications and awards. Our 1988-92 analysis of applications, for instance, accounts for 77 percent of DI-only male application growth from 1988 to 1992, leaving only limited room for the net effect of either supply factors or other omitted factors.[12] Our models account for substantially smaller shares of DI-concurrent application growth for men (58 percent), DI application growth for women (46 percent), SSI application growth for both men and women (50 and 30 percent, respectively), growth in applications from those under 50 (46 percent for DI and 39 percent for SSI), and growth in applications in the mental and musculoskeletal categories (36 percent for DI and 29 percent for SSI).

The econometric models also account for much less award growth than application growth. The award models account for 23 percent of DI and 7 percent of SSI award growth. The fact that the proportion of award growth accounted for by the same factors that were included in the application models is lower is consistent with the hypothesis that SSA's disability programs screen out marginally qualified applicants drawn into the application process by the business cycle and other factors, such as GA program cuts. In fact, although allowance rates increased over the 1988-92 period, the models predict that they should have declined. The finding that recessions have a negative effect on allowance rates was strongly confirmed in our analysis of initial allowance rates for 1980-93.

It is a mistake to attribute all of the application and award growth not accounted for by the variables in the models to supply factors. These shares do not take into account DI growth due to increases in the share of women who are disability insured. The actuarial analysis shows that this factor by itself accounts for substantial application and award growth for women, in younger age groups, and in the mental disorders categories.[13] We also believe that, if anything, the econometric analysis is likely to understate the effect of the recession, GA benefit cuts and associated shifting efforts, and other factors that we were able to measure only imperfectly.

Nonetheless, there are strong reasons to believe that a substantial share of unaccounted for application and, especially, award growth is due to supply factors. With respect to awards, it is difficult to conceive of an alternative explanation for the growth in the allowance rate. With respect to application growth, the fact that almost all of the application growth in the "internal organs" category is accounted for by factors in the model (chart 5), while the other diagnostic groups show substantial unaccounted for growth, is consistent with the hypothesis that regulatory changes—such as increasing the weight given to pain and other symptoms, increasing reliance on source evidence (for example, evidence from the applicant's own health care provider), and broadening the standards for those with mental impairments—resulted in substantial application growth during the 1988-92 period.[14]

A number of cautions are in order in interpreting the analysis of growth not accounted for in the models focusing on the volume of applications and awards disaggregated by impairment category. First, application growth in some categories may simply reflect switching of impairment classifications toward categories in which it has become easier to obtain an award rather than applications that would not have been filed in the absence of supply changes. Second, it is not possible to sort out the effects of various specific supply changes from these results. Third, there are some competing explanations of why unaccounted for growth is especially high in some impairment categories. For instance, unaccounted for growth in the mental disorder category may reflect the fact that State and local efforts to shift welfare recipients onto SSI often target populations with a relatively high prevalence of mental disorders.

In a similar vein, comparison of child and adult SSI disability awards demonstrates that the exceptionally high growth of child awards from 1990 to 1992 was due to supply factors (chart 6). Until 1989, growth in awards for children and adults appeared to respond to very similar forces, but child awards exploded relative to adult awards from 1990 to 1992. This evidence provides support for the hypothesis that the recent rise of child SSI awards is largely attributable to the February 20, 1990, *Sullivan v. Zebley* Supreme Court decision (commonly referred to as the *Zebley* decision), and the 1991 revisions to the childhood mental disorder listings (GAO 1994). The direct estimation of the number of awards affected by regulatory changes, assuming no behavioral response, is another approach that can often provide useful information. For example, Hannsgen and Sandell (1995) simulated the effect of SSA's revised 1992 deeming rules by using the old rules to create a counterfactual and concluded that the seemingly minor rules change resulted in a permanent 2-percent increase in the number of children awarded SSI benefits.

Overall, we conclude that eclecticism is likely to continue to be a virtue in this important and complex area. Actuarial and simulation methods are particularly well-suited for estimating the effect of programmatic changes to the extent that behavioral responses can be reasonably assumed to be nonexistent or negligible. Economic analysis is called for in assessing the effects of changes in the economic environment and to tackle the more complex behavioral effects of programmatic changes.

Concluding Comments on Applications and Awards

Changes in the size of the disability insured population and our econometric analysis of State-level changes in applications and awards account for a substantial portion of DI application growth, especially for men. Our analysis also accounts for a substantial share of SSI application growth, although not as much

as for DI. Population factors are the primary reason that concurrent applications are growing faster than those for either program alone.

Based on the econometric analysis, our review of the literature, interviews with experts, and case studies in five States, we conclude that the acceleration of application and award growth during the 1988-92 period, above long-term trends, is largely attributable to three factors:

(1) the 1990-91 recession;
(2) cuts in general assistance programs and other efforts by States and localities to shift welfare recipients to SSI; and
(3) a variety of supply factors that had the effect of expanding eligibility.

The importance of these three factors varies by program category and is different for awards than for applications. The recession was relatively more important for DI applications than for SSI applications, especially in the DI-only category, while general assistance cuts and State and local shifting efforts had their greatest impact on SSI applications. The effects of supply factors on awards appears to be much greater than on applications. One other factor, the AIDS/HIV epidemic, clearly contributed to the acceleration of application and award growth during this period, but its role appears to have been relatively modest in comparison to the importance of the other three factors.

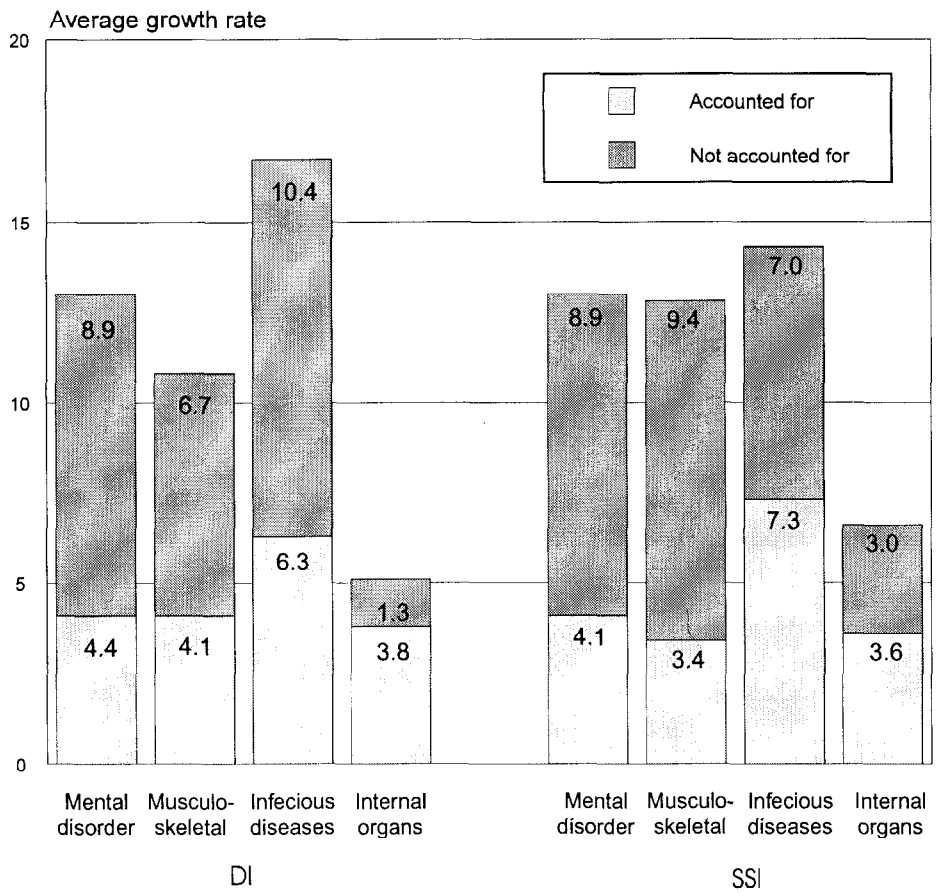
The effects of each of these three factors on application and award growth rates are self-limiting. That is, unless there is continuing change in the factor itself we would not expect the rapid growth it caused initially to continue in the future. Recessions end, and even if they did not, it seems likely that their effect on applications and awards would diminish after a wave of applicants induced by initial job losses passes through the application process. As is evident in the case of Michigan, new State and local efforts to shift welfare recipients onto SSI cause a large surge in applications as the welfare recipients who are most likely to be eligible for SSI apply, but, after this surge, applications subside as the pool of potential applicants who meet eligibility requirements diminishes. Similarly, supply changes that expand eligibility initially draw many applicants from the pool of newly eligible persons, but application growth subsides as the number remaining in the pool diminishes; this was most evident in the surge of adult applications following the 1985 revisions to the adult mental impairment listings and in the 1990-92 surge of child applications following *Zebley* and the new childhood mental impairment listings.

We believe that the major qualitative implication of these findings for future DI and SSI projections is that we need to discount the importance of recent deviations from long-term trends in projecting future trends in application and award growth.[15] This is especially true of business cycles because economic recovery can be expected to follow a recession and this should have the opposite effect on applications. It is also true of once-and-for-all changes in State and local efforts to shift welfare recipients and in the supply of benefits; such changes will lead to permanently higher levels of applications and awards, but not permanently higher growth rates.

Length of Stay and Terminations

Caseload growth is affected not only by applications and awards, but also by the length of time new awardees stay on the rolls. This is particularly important in the case of programs, like the DI and SSI disability programs, where average program stays are long and substantially vary by characteristic, as is clearly demonstrated by the pioneering studies of Hennessey and Dykacz (1989) and Rupp and Scott (1995a). Chart 7 shows cohort-based estimated mean length of stay on the DI and SSI rolls for working-age DI and SSI-only new awardees and SSI childhood new awardees. The expected mean total stays of DI and SSI adult awardees during the preretirement years

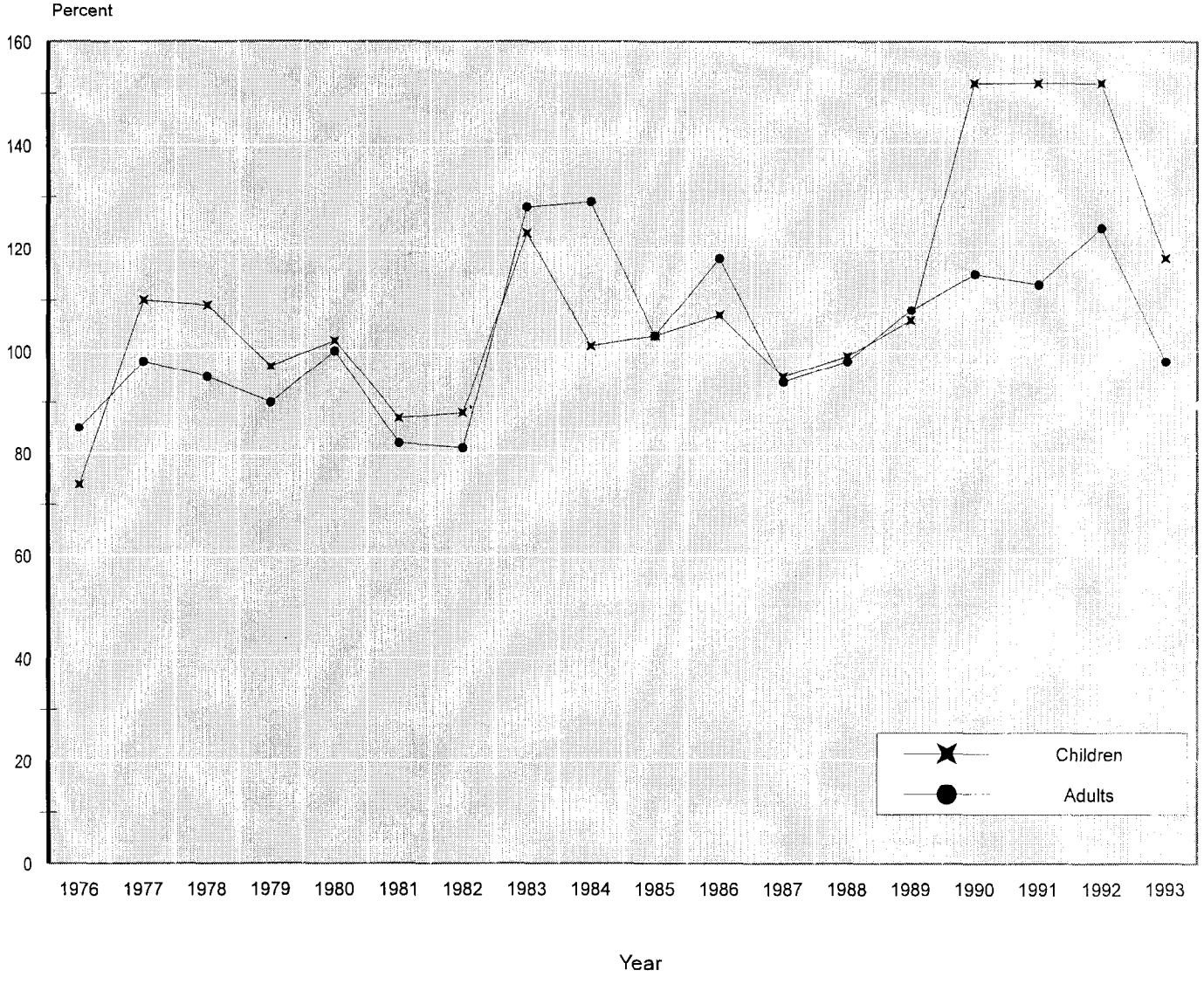
Chart 5.—Annual application growth rate, accounted for and not accounted for, by program and impairment, 1988-92



are roughly comparable (approximately 10 years).[16] Rupp and Scott (1995a) estimate that based on past program experience children, in contrast, are expected to spend, on the average, almost 27 years on the SSI rolls prior to reaching their 65th birthday. Mean SSI lengths of stay among concurrent awardees is much shorter than among nonconcurrent adult awardees, primarily because many concurrent awardees lose SSI benefits once they start to receive DI benefits. The most important piece of information on concurrent awardees—the combined length of SSI and DI stays—has not been estimated yet. Expected length of stay on both the DI and SSI rolls varies substantially by age and diagnostic group.

Length of stay is important in two respects: first, by translating new awards into benefit years, length of stay determines the effects of new awards on ultimate program caseloads and therefore substantially influences program costs; and second, the expected length of stay may also affect application behavior. Because age, diagnosis, and the severity of disabling conditions are all powerful predictors of length of stay, changes in any of these factors could affect program caseloads and the average length of stay for those on the rolls. Average length of stay is particularly sensitive to outliers, and therefore to any factors affecting the proportion of long stayers. Rupp and Scott (1995a) estimate that while SSI awardees with expected preretirement-age disability stays of 10 years or more comprise only about one-third of new awardees, they comprise 83.3 percent of the implied eventual caseload in SSI. Although the proportion of long-stayers is somewhat lower in DI (as a result of the absence of children in the disabled-worker program), long-stayers are much more important in both programs than in AFDC, the program defining the popular image of welfare dependence. Legislative and regulatory changes, such as the conduct of Continuing Disability Reviews (CDRs) and liberalized work incentives under both SSI and DI, might affect caseloads directly through influencing length of payment eligibility spells, and indirectly through the effect of implied changes in expected lifetime benefit streams on application behavior.

Chart 6.—SSI blind and disabled awards as a percent of previous year's awards, 1976-93



There is some evidence that change in the mix of new awardees has contributed to a secular increase in average length of stay in both DI and SSI. According to Chirikos (1993), changes in the composition of DI awardees, primarily by age and diagnosis, is responsible for an increase of average expected length of DI spells from 8.5 years during 1960-62 to 10.7 years during 1989-91. Rupp and Scott (1995b), using a different methodology, arrive at estimates consistent with the results of the Chirikos study. Rupp and Scott estimate that the longer term shift toward younger awardees during the 1975-93 period contributed to an increase from a simulated mean length of stay of 9.5 years of first DI stays for persons first awarded benefits in 1975, to a simulated mean length of first DI stays of almost 11 years among those first awarded benefits in 1993.

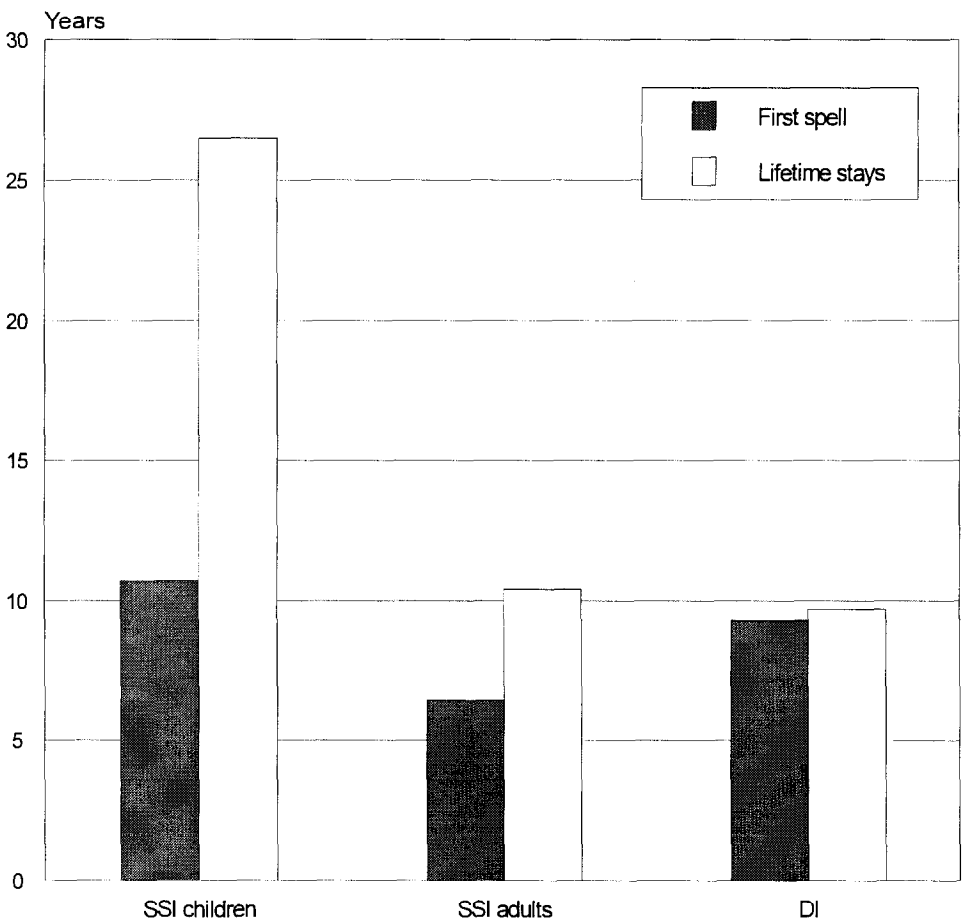
Simulated length of total stay during the preretirement years in the SSI disability program changed even more dramatically. Rupp and Scott (1995b) estimate that the average total stay for childhood and nonconcurrent adult SSI disability awardees combined was approximately 12 years for persons first awarded benefits in 1974. In contrast, persons first awarded SSI disability benefits in 1993 are expected to stay on the SSI disability rolls prior to reaching their 65th birthday for an average of almost 18 years, assuming that current program rules do not change dramatically in the future. Much of this estimated increase in average SSI disability duration is attributable to the recent influx of childhood awardees in the SSI program. For working-age, nonconcurrent adults the SSI trends are similar to the DI trends. The trends attributable to past changes in the age mix of new awardees are expected to create an upward pressure on future caseloads even if the characteristics of new awardee cohorts were to change markedly in the future.

The strong negative association between age and expected lifetime stays demonstrated by Hennessey and Dykacz (1989) for DI, and Rupp and Scott (1995a) for SSI, has important implications for the disability caseload effects of the aging of the baby boom generation. Rupp and Scott (1995b) estimate that the increase in the proportion of younger DI insured workers during the last two decades explains about half of the 1975-93 increase in the expected average duration of successive cohorts of new DI entrants. However, as the baby boom generation ages during the decades ahead, demographic factors are expected to have an opposite effect on duration. Rupp and Scott (1995b) estimates that changes in the age-composition of DI-insured workers between 1993 and 2006, by themselves, would lead to an approximately 1-year decline in the expected duration of new DI awardees on the disability rolls.

To obtain a complete picture of the effect of demographic changes on caseload the effect of age both on incidence rates and on expected duration needs to be considered. The two effects tend to work in opposite directions. Chart 8, based on Rupp and Scott (1995b), shows that age is positively associated with incidence rates in both the DI and SSI disability programs.[17] In contrast, duration is negatively associated with age at award. Because the effect of age on incidence rates tends to be stronger than its effect on duration, the net effect on caseloads—expressed as benefit years associated with awardee cohort by age—tends to be positive.

Thus, we can infer that the caseload effects of the entry of the baby boom generation has been initially moderated by the relatively low disability incidence rates at younger ages. As the baby boom generation ages, the upward pressure on new awards arising from the strong positive association between disability incidence rates should be moderated by the associated anticipated decline in expected length of stay; the result is a muted effect on total benefit years. Because the disability incidence rate rises more steeply

Chart 7.—Mean of first spell and expected lifetime disability program stays



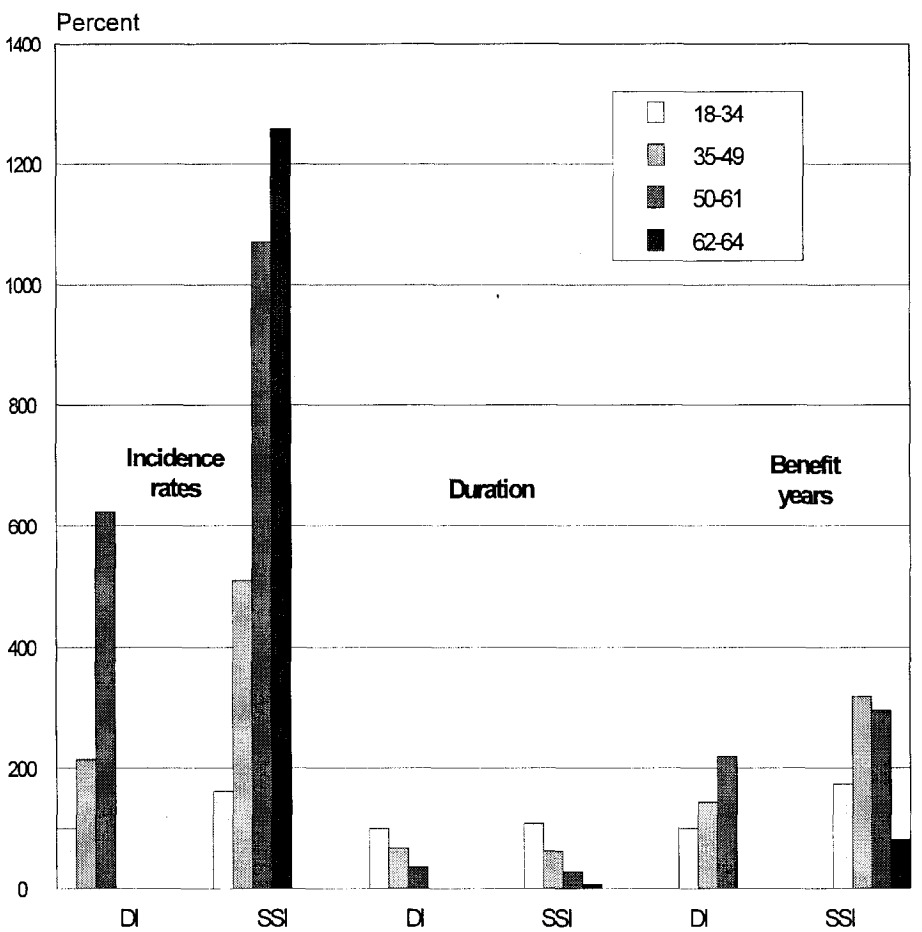
with age than length of stay declines, the net effect of the two contrasting forces is still an expected increase in caseloads resulting from the aging of the baby boom generation.

More research is needed to understand the implications of other factors, such as the business cycle, on the expected length of stay of new awardees. Factors affecting the diagnostic mix of new awardees (such as the revised mental regulations) as well as case severity (assessment of pain, functional assessments) might affect not only the number of new awards, but also expected length of stay. In particular, legislative and regulatory changes affecting the proportion of cases with low age-adjusted mortality risk should affect expected length of stay.

Length of stay is also affected by policies focusing on people on the rolls. The cohort-based comparison of DI exit rates during the seventies and eighties (Hennessey and Dykacz 1993) suggests that the liberalized DI work incentives introduced during the eighties actually might have increased length of stay and might have induced additional applications as well (see Hoynes and Moffitt 1994). More research is needed on the effect of CDRs and the medical improvement standards not only on length of stay among the directly affected beneficiaries, but also on applications.[18] Current program design suggests only a limited role for vocational rehabilitation and return to work (Rupp, Bell, and McManus 1994), but more radical reforms might induce larger effects on length of stay in the future.

While annual termination rates have declined over the long term, such data confound the effects of changes in the relative size of successive annual entry cohorts with changes in exit probabilities. Cohort-based studies are better suited for understanding caseload dynamics and the effects of changes in the characteristics of new cohorts of awardees on long-term caseload growth. In order to develop a better understanding of application and award growth, future studies linking award growth to caseload dynamics are likely to be fruitful.

Chart 8.—DI and SSI incidence rates, mean duration, and benefit years, expressed as a percent of the mean for 18-34 year old DI awardees, by age



Issues for Future Research

Improvements in our understanding of factors affecting caseload growth are important for improving our ability to make projections, as well as to address the policy issues raised by program growth in a proactive manner. Recent work confirmed the importance of demographics and led to a better understanding of business cycle effects. More work is needed to assess the interaction of SSA's disability programs with other programs and long-term changes in labor markets, as well as the interaction of award growth with caseload dynamics. Most important, the assessment of the effects of changes in SSA's disability programs themselves calls for further improvements in our ability to model the effect of such changes, particularly their behavioral effects. Ongoing and future analytic work using new data sets that provide a rich array of individual-level information on variables relevant to modelling behavioral responses to economic and programmatic factors (such as the planned Disability Evaluation Study, and the matched SIPP-SSA administrative microdata files that have been developed by SSA's Office of Research and Statistics) will substantially enhance our understanding of the behavioral processes affecting disability program participation. Although recent work increased our understanding of caseload growth, ongoing changes in the economy and public policies, as well as methodological challenges, suggest the need for a rigorous program of ongoing future research efforts in this important area.

Notes

[1] More details of the findings on applications and awards can be found in five papers that were prepared for the July 20-21, 1995, conference on growth in the disability pro-

grams sponsored by the SSA and the Office of the Assistant Secretary for Planning and Evaluation (Bound, Kossoudji, and Ricart-Moes 1995; Stapleton, Coleman, and Dietrich 1995; Stapleton and Dietrich 1995; Stapleton and Livermore 1995; and Stapleton, Livermore, and Zueschner 1995), and in the final reports for four Lewin-VHI projects (Lewin-VHI 1995a, b, c, and d). More details of the duration findings appear in another conference paper (Rupp and Scott 1995a) and in a previous article in the *Social Security Bulletin* (Rupp and Scott 1995b). Other papers presented at the recent conference include Muller and Wheeler (1995) presenting results from SSA's survey of field office managers; Daly (1995) focusing on the characteristics of SSI and DI recipients based on the Panel Survey of Income Dynamics data, and Yelowitz (1995) discussing the impact of health care costs and Medicaid on the SSI program.

[2] The law provides a 45-month period for disabled beneficiaries to test their ability to work without losing their entitlement for benefits (Committee on Ways and Means 1994). The period consists of (1) a "trial work period" (TWP) which allows disabled beneficiaries to work for up to 9 months (within a 5-year period) with no effect on their disability or (if eligible) Medicare benefits, and (2) a 36-month "extended period of eligibility," during the last 33 of which disability benefits are suspended for any month in which the individual is engaged in substantial gainful activity (SGA). Medicare coverage continues so long as the individual remains entitled to disability benefits and, depending on when the last month of SGA occurs, may continue for 3 to 24 months after entitlement to disability benefits ends. Note that only one TWP is allowed in any one period of disability. The TWP is completed only if the 9 months are within a 60-month period. By regulation, earnings of more than $200 a month constitute "trial work."

[3] A conceptually similar approach has been used by James Tobin (1994) in a recent analysis of the effect of unemployment on poverty rates.

[4] Because DI and SSI claims are not always filed simultaneously, this definition of concurrent applicants is not equivalent to SSI applicants who also filed for DI; hence the label DI-concurrent.

[5] For initial determinations the definition of concurrent is based on the status of claims at the time the determination is made.

[6] The GA survey data were collected by Sherrie Kossoudji at the University of Michigan. We are grateful to Alan Shafer of SSA's Office of Disability for facilitating the matching process. See Bound, Kossoudji, and Ricart-Moes (1995) for further details.

[7] For this analysis we first estimated what 1992 applications for each program would have been for each age group in each State by applying the 1988 application rate to the 1992 population in the age group and State. We then added across age groups and States to get a "projected" national value for 1992. We divided the projected value by the actual 1988 value, took the fourth root, and subtracted 1.0 to get the annual growth rate reported.

[8] During the 1988-92 period the average annual growth rate of DI applications was 8.9 percent, while the corresponding figure for SSI was 10.5 percent. Thus, population growth and aging is estimated to account for a 15-percent share of DI application growth and a 11-percent share of of SSI application growth during this period.

[9] We note that there are several ongoing data collection and analytic efforts that are expected to result in major improvements in our ability to address these issues more directly in the future. Most notably, analysts at the Office of Research and Statistics at SSA assembled a matched data file containing survey information from the SIPP and SSA administrative records at the individual level. This data file has the potential for measuring DI-insured status and SSI financial eligibility at the individual level. Lahiri, Vaughan, and Wixon (in this issue of the *Bulletin*) developed and tested a structural model of the disability determination process using the SIPP/SSA matched data file. SSA's planned Disability Examination Study is expected to provide detailed cross-sectional information on the most important variables affecting the disability determination process. Rupp and Scott (1995b) report cross-sectional estimates of the size of the financially eligible SSI population, derived using the SSI microsimulation model that was developed by Vaughan and Wixon using the 1984 SIPP (1989).

[10] See General Accounting Office (1995). A total of 6,500 fraud cases have been identified in the States of California and Washington, combined.

[11] Estimated elasticities represent the estimated percent effect of a percent change in the given independent variable on the dependent variable (applications or awards).

[12] Note that this upper bound refers to *net* effects of unmeasured factors. It is entirely conceivable that even if the net residual is small, there is room for potentially larger effects that work in opposite directions. Nevertheless, we note that the most prominent supply-side factors that have been hypothesized to affect applications and awards during this period were presumed to affect applications and awards in one direction—positively. To the extent supply-side factors operating in the opposite direction are negligible, the upper bound would apply to any single supply-side factor hypothesized to account for the unexplained residual. Note, however, that the independent variables considered in our models may also pick up some supply-side effects.

[13] Our actuarial analysis indicates that this factor alone accounts for 19 percent of female DI application growth. Because the actuarial and econometric analyses were performed independently, however, we can not simply add this share to the share accounted for by the econometric analysis to get the share explained by all factors combined; the actual share accounted for by the combined factors together could be either larger or smaller.

[14] New listings for mental impairments in 1985 placed substantially more weight on functional assessments. While a large initial impact of this change was evident in 1986, it could be that the impact of this change was also felt more recently as State and local governments, advocates, and lawyers learned how to best take advantage of the changes.

[15] We use the term "discount" here in a technical sense meaning that the weight given to observations reflecting recent deviations from longer-term trends should be relatively small in creating projections of future trends. We do not propose a specific methodology to establish such weights in this article. Nor do we imply that such deviations are "unimportant" in a qualitative sense. Indeed, we believe that short-term deviations from longer-term trends are important for several additional reasons—such as in budgeting administrative expenditures, making management decisions concerning the allocation of resources for the processing of applications, and in affecting future caseloads due to the long expected duration on the rolls among persons drawn into SSA's disability programs by factors affecting short-term deviations from longer-term trends, such as the business cycle.

[16] The DI estimates represent the experience of a cohort of 1972 new DI awardees, while the SSI estimates are based on a pooled sample of 1974 through 1982 new SSI awardees. Despite these differences in

sample frames, we believe that the DI and SSI figures are roughly comparable.

[17] DI incidence rates reflect DI awards relative to the size of the DI insured population. The SSI incidence rates represent SSI nonconcurrent awards relative to the population financially eligible for SSI (Rupp and Scott (1995b).)

[18] Since the tightening of initial determinations (increased denial rates) might coincide with attempts to take people off the rolls, this potential confounding needs to be taken into account in assessing the validity of previous estimates of the effect of denial rates on applications.

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Appendix

In this first section we provide a technical description of the methodology; selected regression results appear in the next section; and 1988-92 results of simulations appear in the final section.

Specification of Pooled Cross-Section, Time-Series Models

As discussed in the text, using annual data for States, we estimated a series of pooled cross-section, time-series models of applications and awards for the 1988-92 period, and of initial determinations and allowance rates for the 1980-93 period. For the 1988-92 analysis, State application data were disaggregated and analyzed by program, gender, age, and impairment. There were three program groups (DI-only, DI-concurrent, and total SSI), the two gender categories, five age groups (under age 30; 30 to 39; 40 to 49; 50 to 59; and 60 to 64), and four impairment categories (mental illness and mental retardation; musculoskeletal; infectious diseases, including AIDS/HIV, and impairments not otherwise classified;[1] and internal organ disorders—including cardiovascular disorders, respiratory disorders, neoplasms, and other internal disorders, as well as impairments caused by accidents. Thus, we estimated a total of 120 (3x2x5x4) application equations; each equation refers to applications in a specific program/gender/age/impairment group.

The 1988-92 award analysis was performed at a higher level of aggregation—by program and gender only (six equations). While we initially obtained award data at the more disaggregated level, the 1992 award data were very incomplete because many decisions were still pending. We were subsequently able to obtain updated data, but only at the higher level of aggregation.

The 1980-93 initial determination and initial allowance rate analysis was performed at a still higher level of aggregation—by program only (DI-only, concurrent, and SSI-only).

The models used in all of the analysis had the same structure. In each case the dependent variable is the (natural) logarithm of one of the following: an application rate (applications per thousand population); an incidence rate (awards per thousand population); an initial determination rate (initial determinations per thousand population); or an initial allowance rate (initial allowances per initial determination). In the application analysis, the population in the denominator is for the relevant age/gender group; in the award analysis it is for those aged 18 to 64 of the relevant gender; and in the initial determination analysis it is for all those aged 18 to 64.

The dependent variable in each application equation is the logarithm of an application rate. For the higher level of aggregation, the rate is shown as male or female applications for the program per one thousand adult males or females, respectively. For the lower level of aggregation, it is shown as an impairment-specific application rate for the age/gender group—the number of applications in the relevant program category per thousand persons from the age/gender group in one of the four impairment categories. The dependent variable in the corresponding award equation is the corresponding impairment-specific incidence rate—the number of awards in the impairment category per thousand persons in the age/gender group.

Each equation estimated had the following general form:

$$\ln(A_{st}) = \beta_s + \beta_1 X_{1st} + \beta_2 X_{2st} + \ldots + \beta_K X_{Kst} + \alpha_1 V1_t + \ldots \alpha_T VT_t + E_{st}$$

where:

- A_{st} is an application, incidence, initial determination, or initial allowance rate, as specified above, in State s and year t;
- β_s is the intercept for States (the equation intercept varies across States). The intercepts are sometimes referred to as fixed State effects because they capture the effects of all factors that vary across States but not over time;
- $X_{1st}, X_{2st}, \ldots, X_{kst}$ are the explanatory variables. For the 1980-93 analysis these include both current and prior year values of selected variables;
- $\beta_1 \ldots \beta_k$ are the coefficients of the X variables, to be estimated;
- $V1_t \ldots VT_t$ are dummy variables for each year of data except the first (base) year. V1 equals 0 for the first year and 1 for all subsequent years, V2 equals 0 for the first and second year and 1 for all subsequent years, and so forth. VT equals 1 in the last year (T) only;
- $\alpha_1 \ldots \alpha_t$ are the coefficients of the year dummies. These are sometimes called year or time effects because each coefficient captures the effects of changes in all national factors in the corresponding year that have the same impact on the dependent variable in all States; and
- E_{st} is the error term for State s and year t.

As described in the text, the analysis relates within-State *changes* in the dependent variable to *changes* in the explanatory variables. This is not immediately evident in the above specification, but is in fact the correct interpretation because of the presence of a different intercept for each State. Since these control for all cross-State differences that are fixed over time, they in effect control for all of the base-year values of the explanatory variables as well as the base-year value of the

dependent variable. Hence, the coefficients of the explanatory variables are determined solely by how the dependent variables change over time in relationship to how the explanatory variables change over time.

The models were estimated by weighted-least squares, with weights equal to the size of the State's population in the relevant age/gender category. This method yields efficient estimates if the variances of the regression disturbances are inversely proportional to the size of the group population in the State and the disturbances are independent across States and over time. Weighted estimates also provide better predictions of the national level of applications and awards relative to unweighted estimates. The reason for this is that they improve the fit for large States relative to small States, and growth in large States determines a large share of national growth.[2]

We also looked for evidence of serial correlation in the disturbances. In the 1988-92 analysis we assessed the importance of serial correlation and other dynamic specification issues by comparing the results obtained from weighted-least squares using the full 5 years of data to results obtained using just the first (1988) and last (1992) year of data alone. The main findings were very robust in this comparison. The individual State intercepts wash-out any autocorrelation in the 2-year estimates, which are the basis of the findings reported here. In the 1980-93 analysis it was essential to use all years' observations in order to examine dynamic aspects of initial determinations and allowance rates. Hence, we specified a first-order autoregressive model for each State's weighted disturbance, with a common autocorrelation coefficient for all States. The estimated coefficient was always between zero and one, and usually significant. We also found some evidence of spatial correlation in pairs of adjacent States, but the evidence was erratic and did not warrant the substantial effort required to correct for it. Ignoring spatial correlation does not bias parameter estimates, but can result in estimated standard errors that are biased toward zero. The models were estimated using the program Statistical Analysis Software; the REG procedure was used for the 1988-92 analysis and the MODEL procedure was used for the 1980-93 analysis. Standard errors for the 1980-93 models were corrected for any cross-State heteroskedasticity in the weighted disturbances, but this was not done for the 1988-92 analysis.

Regression Results

Selected application and award regression results for the 1988-92 period are reported in table I. These results were estimated using application and award data disaggregated by program and gender only; the voluminous application results by program, gender, age, and impairment are reported in the appendix to Lewin-VHI (1995a). Selected results from the 1980-93 analysis of initial determinations and allowance rates appear in tables II and III.

Simulation Results for 1988-92

We report simulation results based on the 1988-92 application and award models in table IV. These show the percentage points of average annual growth in applications or awards during the period that are accounted for by each variable included in the final regression models, by program and gender. The application results were obtained by aggregating results simulated by program, gender, age, and impairment to the level of program and gender. Note that they do not correspond to the aggregate regression results reported in table I, but those regressions in fact yield results that are very similar. Application simulations by age and by impairment are reported in the appendix to Lewin-VHI (1995a). The award simulations are based on the award regressions reported in table I.

Appendix Notes

[1] AIDS/HIV cases first were included in the other impairment category before being recategorized in the infectious disease category.

[2] To test for heteroskedasticity, we estimated White standard errors and found that they were not significantly different from the standard errors estimated by weighted-least squares.

Table I.—Regression estimates from the analysis of applications and awards for the 1988-92 period

[Dependent variable: Logarithm of per-capita application or incidence rate in gender/program category][1]

Independent variable	Applications						Awards					
	DI only		DI concurrent		SSI total		DI only		DI concurrent		SSI total	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Unemployment rate[2]	0.266*	0.128*	0.323*	0.074	0.209*	0.050	0.181*	0.056	0.189*	0.015	0.113*	0.065
	(7.3)	(4.1)	(7.7)	(1.6)	(5.9)	(1.3)	(4.6)	(1.4)	(3.9)	(.3)	(2.7)	(1.3)
GA program cuts[3]	(4)	(4)	.073*	(4)	.122*	.086*	(4)	(4)	.082*	(4)	.099*	.085*
	(4)	(4)	(3.4)	(4)	(6.7)	(4.4)	(4)	(4)	(3.3)	(4)	(4.7)	(3.3)
AIDS/HIV incidence[5]	.037	(4)	.107*	(4)	.078*	(4)	-.006	(4)	.029	(4)	-.091*	(4)
	(1.0)	(4)	(2.5)	(4)	(2.2)	(4)	(-.2)	(4)	(.6)	(4)	(-2.2)	(4)
IRCA legalizations[6]	(4)	(4)	(4)	(4)	.016	.003	(4)	(4)	(4)	(4)	-.068*	-.076*
	(4)	(4)	(4)	(4)	(1.3)	(.2)	(4)	(4)	(4)	(4)	(-4.7)	(-4.3)
Percent of children in single-parent families[7]	- .010	.087	.285	.408*	.280*	.418*	-.142	-.084	.086	.144	.129	.063
	(-.1)	(.8)	(1.9)	(2.4)	(2.2)	(3.1)	(-1.0)	(-.6)	(.5)	(.7)	(.9)	(.4)
Time effect for 1992 vs. 1988[8]	.056*	.235*	.190*	.388*	.207*	.287*	.165*	.346*	.311*	.474*	.426*	.403*
	(2.2)	(14.8)	(6.4)	(16.7)	(8.0)	(14.8)	(6.1)	(16.6)	(9.0)	(16.0)	(14.1)	(15.6)

T-values are in parentheses.

*Significant at the .05 level.

[1]Coefficients of variables specified in logarithms are elasticities by definition. Except for the time effect, all other coefficients have been converted to elasticities "at the mean" by multiplying the coefficient itself by the mean variable. A separate intercept for each State was also included in each model (not reported).

[2]The variable used the log of the State's unemployment rate.

[3]The GA variable used is the number of cuts in GA beneficiaries per capita between 1991 and 1992 in seven States and the District of Columbia, and zero in all other States.

[4] Variable not included.

[5]The AIDS/HIV variable is the logarithm of the incidence rate.

[6]The IRCA legalizations variable is zero in 1988 and is the number of legalizations per capita in 1992.

[7]The percent of children in single-parent families is in logarithms.

[8]This coefficent is an estimate of the percentage increase in the dependent variable from 1988 to 1992 that is not accounted for by the explanatory variables.

Table II.—Regression estimates for initial determiniation models, 1980-93

[Dependent variable: The log of initial determinations per capita]

Explanatory variables[1]	DI only			Concurrent			SSI only		
	1980-93	1980-87	1988-93	1980-93	1980-87	1988-93	1980-93	1980-87	1988-93
Expected application rate[2, 3]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Unemployment rate[2, 3]									
Current	0.086*	0.056*	0.099*	0.088*	0.083	0.085*	-0.022	0.045	-0.060
	(4.06)	(1.97)	(4.05)	(2.91)	(1.90)	(2.90)	(-.72)	(1.04)	(-1.74)
-1	.099*	.066*	.125*	.123*	.078	.132*	.091*	.124*	.001
	(4.57)	(2.36)	(4.23)	(3.88)	(1.72)	(4.20)	(2.97)	(2.99)	(.04)
-2	.097*	.117*	.027	.050	-.062	.042	.073*	.085*	-.006
	(4.83)	(4.4)	(1.06)	(1.63)	(-1.41)	(1.36)	(2.42)	(1.99)	(-.16)
Sum[4]	.282*	.239*	.251*	.261*	.099	.259*	.142*	.254*	-.065
	(10.5)	(7.6)	(6.9)	(6.6)	(1.7)	(6.9)	(3.0)	(4.0)	(-1.5)
Labor-force participation[2, 3]									
Current	-.634*	-.608*	-.616*	.065	-.147	-.015	.201	-.427	.032
	(-3.34)	(-2.60)	(-2.57)	(.25)	(-.42)	(-.06)	(.77)	(-1.21)	(.11)
-1	-.046	.414*	-.465*	-.479*	-.773*	-.602*	-.427	.052	-1.196*
	(-.27)	(1.97)	(-2.12)	(-2.03)	(-2.50)	(-2.48)	(-1.78)	(.17)	(-3.87)
-2	-.181	-.149	.061	-.256	-.621*	-.371	-.820*	-.628*	-1.153*
	(-1.14)	(-.74)	(.28)	(-1.14)	(-2.10)	(-1.53)	(-3.56)	(-2.11)	(-3.82)
-3	-.040	.007	-.378	.118	-.055	-.362	-.223	-.117	-.632*
	(-.25)	(.03)	(-1.70)	(.52)	(-.18)	(-1.45)	(-.97)	(-.39)	(-1.99)
Sum[4]	-.901*	-.336	-1.398*	-.552	-1.596*	-1.350*	-1.269*	-1.120	-2.949*
	(-2.8)	(-.8)	(-3.5)	(-1.2)	(-2.8)	(-2.8)	(-2.3)	(-1.7)	(-4.9)
Manufacturing employment[2, 3]	-.072	-.180*	-.072	(5)	(5)	(5)	(5)	(5)	(5)
	(-1.45)	(-2.46)	(-.66)	(5)	(5)	(5)	(5)	(5)	(5)
AIDS\HIV[3]	-.008	-.011	.004	-.018	-.003	-.019*	-.032*	-.022	.018
	(-1.18)	(-.43)	(.58)	(-1.79)	(-.10)	(-1.98)	(-3.04)	(-.64)	(1.57)
Poverty[2, 3]	(5)	(5)	(5)	.037	.091*	.007	.045	.065	.018
	(5)	(5)	(5)	(1.34)	(2.37)	(.26)	(1.79)	(1.76)	(.56)
GA changes	(5)	(5)	(5)	.002	-.003	.004*	.005	.009*	.005*
	(5)	(5)	(5)	(.60)	(-.87)	(2.13)	(1.79)	(2.20)	(2.18)
AFDC[2]	(5)	(5)	(5)	-.010	-.003	-.008	-.226*	-.303*	.091
	(5)	(5)	(5)	(-.20)	(-.05)	(-.09)	(-3.84)	(-4.90)	(.90)
SSI Supplements[2]	(5)	(5)	(5)	.382*	.758*	.284	.801*	.734*	.840*
	(5)	(5)	(5)	(4.34)	(6.11)	(1.90)	(7.67)	(5.82)	(4.39)
Autoregressive parameter	.534*	.344*	.172*	.515*	.278*	.368*	.727*	.503*	.338*
	(14.34)	(5.81)	(2.26)	(14.99)	(4.64)	(4.92)	(22.95)	(9.14)	(4.46)
Weighted State intercept	-6.469	-6.454	-6.746	-2.494	2.180	-3.681	.147	-1.636	4.709

See footnotes at end of table.

Table II.—Regression estimates for initial determiniation models, 1980-93—*Continued*

[Dependent variable: The log of initial determinations per capita]

Explanatory variables[1]	DI only			Concurrent			SSI only		
	1980-93	1980-87	1988-93	1980-93	1980-87	1988-93	1980-93	1980-87	1988-93
Time effects									
1981	-0.083*	-0.071*	(5)	-0.117*	-0.119*	(5)	-0.120*	-0.140*	(5)
	(-7.01)	(-5.60)	(5)	(-6.40)	(-5.49)	(5)	(-6.75)	(-6.87)	(5)
1982	-.178*	-.178*	(5)	-.160*	-.158*	(5)	-.169*	-.190*	(5)
	(-15.25)	(-14.26)	(5)	(-9.04)	(-7.67)	(5)	(-9.49)	(-9.74)	(5)
1983	-.095*	-.091*	(5)	.044*	.063*	(5)	.030	.016	(5)
	(-8.75)	(-8.14)	(5)	(2.81)	(3.36)	(5)	(1.91)	(.89)	(5)
1984	-.001	-.011	(5)	.080*	.115*	(5)	.051*	.064*	(5)
	(-.05)	(-.82)	(5)	(4.76)	(5.45)	(5)	(3.02)	(3.19)	(5)
1985	-.015	-.028*	(5)	.032*	.035*	(5)	.055*	.062*	(5)
	(-1.40)	(-2.45)	(5)	(2.12)	(1.99)	(5)	(3.73)	(3.78)	(5)
1986	.070*	.067*	(5)	.219*	.204*	(5)	.157*	.160*	(5)
	(6.73)	(6.16)	(5)	(15.20)	(12.53)	(5)	(10.92)	(9.95)	(5)
1987	.028*	.019	(5)	.016	.036*	(5)	.057*	.057*	(5)
	(2.94)	(1.84)	(5)	(1.15)	(2.23)	(5)	(4.15)	(3.58)	(5)
1988	.011	(5)	(5)	-.082*	(5)	(5)	.052*	(5)	(5)
	(1.17)	(5)	(5)	(-6.05)	(5)	(5)	(3.81)	(5)	(5)
1989	-.005	(5)	-.008	-.035*	(5)	-.032*	.032*	(5)	.035*
	(-.49)	(5)	(-.89)	(-2.60)	(5)	(-2.93)	(2.42)	(5)	(2.81)
1990	.032*	(5)	.026*	.091*	(5)	.096*	.093*	(5)	.102*
	(3.40)	(5)	(3.06)	(6.80)	(5)	(9.22)	(7.10)	(5)	(8.58)
1991	.014	(5)	.009	.091*	(5)	.098*	.161*	(5)	.187*
	(1.42)	(5)	(.98)	(6.74)	(5)	(9.17)	(12.14)	(5)	(14.94)
1992	.038*	(5)	.035*	.175*	(5)	.171*	.281*	(5)	.328*
	(4.10)	(5)	(4.24)	(12.13)	(5)	(13.69)	(19.38)	(5)	(21.72)
1993	.003	(5)	.004	.106*	(5)	.107*	.169*	(5)	.146*
	(.26)	(5)	(.38)	(6.27)	(5)	(7.87)	(10.00)	(5)	(9.01)

T-values are in parentheses.
*Significant at the .05 level.
[1] See Lewin-VHI (1995d), exhibit III.A.1 for variable definitions.
[2] Variable is logarithms.
[3] Variable is age adjusted.
[4] Coefficient reported is the sum of the current and lagged coefficients.
[5] Variable not included.

Source: Lewin-VHI analysis of SSA data on initial disability determinations, using data for all 50 States and the District of Columbia.

Table III.—Regression estimates for allowance rate models, 1980-93

[Dependent variable: The log of initial allowance rates]

Explanatory variables[1]	DI only			Concurrent			SSI only		
	1980-93	1980-87	1988-93	1980-93	1980-87	1988-93	1980-93	1980-87	1988-93
Unemployment rate [2, 3]									
Current	0.032	-0.002	0.003	-0.027	-0.209*	-0.051	0.000	-0.105*	-0.037
	(1.42)	(-.07)	(.13)	(-.77)	(-3.74)	(-1.34)	(.00)	(-2.39)	(-1.27)
-1	-.104*	-.058	-.099*	-.188*	-.130*	-.208*	-.158*	-.130*	-.148*
	(-4.54)	(-1.63)	(-3.53)	(-5.28)	(-2.40)	(-4.94)	(-5.66)	(-2.89)	(-4.77)
-2	-.115*	-.102*	-.058*	-.113*	-.132*	-.045	-.136*	-.132*	-.097*
	(-5.41)	(-3.25)	(-2.29)	(-3.23)	(-2.54)	(-1.15)	(-4.83)	(-3.07)	(-3.16)
Sum [4]	-.187*	-.162*	-.154*	-.328*	-.471*	-.304*	-.294*	-.367*	-.282*
	(-6.5)	(-4.4)	(-4.2)	(-6.5)	(-6.1)	(-6.1)	(-6.9)	(-6.2)	(-6.9)
Labor-force participation [2, 3]									
Current	.383*	.726*	.863*	-.358	-.335	.477	-.238	.071	-.112
	(1.96)	(2.52)	(3.44)	(-1.13)	(-.75)	(1.33)	(-.94)	(.21)	(-.42)
-1	.047	-.034	.783*	-.040	-.381	1.066*	-.131	-.143	.485
	(.27)	(-.13)	(3.45)	(-.14)	(-1.04)	(2.94)	(-.58)	(-.51)	(1.74)
-2	-.404*	.308	-.844*	-.498	.175	-1.114*	-.034	.605*	-.345
	(-2.40)	(1.33)	(-3.72)	(-1.82)	(.49)	(-3.11)	(-.16)	(2.22)	(-1.25)
-3	.116	.620*	-.104	.220	.780*	.254	.584*	.772*	1.128*
	(.68)	(2.69)	(-.44)	(.80)	(2.25)	(.69)	(2.71)	(2.91)	(3.77)
Sum [4]	.142	1.620*	.698	-.676	.239	.683	.181	1.305*	1.156*
	(.4)	(3.6)	(1.4)	(-1.2)	(.3)	(.8)	(.4)	(2.4)	(2.1)
Manufacturing employment [2, 3]	-.074	.036	.152	(5)	(5)	(5)	(5)	(5)	(5)
	(-1.47)	(.54)	(1.32)	(5)	(5)	(5)	(5)	(5)	(5)
AIDS/HIV [3]	.011	.001	-.010	.051*	.124*	-.006	.042*	.064*	-.008
	(1.56)	(.04)	(-1.46)	(3.98)	(2.76)	(-.56)	(3.82)	(2.02)	(-.90)
Poverty [2, 3]	(5)	(5)	(5)	.018	.065	-.005	-.014	.051	-.017
	(5)	(5)	(5)	(.57)	(1.47)	(-.13)	(-.57)	(1.37)	(-.64)
GA changes	(5)	(5)	(5)	.001	-.012	.004*	.002	-.010*	.006*
	(5)	(5)	(5)	(.22)	(-1.85)	(2.08)	(.77)	(-2.13)	(2.83)
AFDC [2]	(5)	(5)	(5)	.052	.053	-.163	.166*	.121*	.028
	(5)	(5)	(5)	(.71)	(.66)	(-1.17)	(2.84)	(2.06)	(.31)
SSI supplements [2]	(5)	(5)	(5)	-.127	.187	.280	-.139	.022	.411*
	(5)	(5)	(5)	(-1.12)	(1.23)	(1.08)	(-1.50)	(.20)	(2.18)
Autoregressive parameter	.547*	.283*	.461*	.620*	.455*	.563*	.685*	.293*	.529*
	(15.45)	(4.81)	(6.36)	(17.76)	(7.95)	(8.31)	(20.34)	(4.86)	(7.73)
Weighted State intercept	-1.001	-.924	-.870	-2.406	1.554	.140	-.745	.750	4.476

See footnotes at end of table.

Table III.—Regression estimates for allowance rate models, 1980-93—*Continued*

[Dependent variable: The log of initial allowance rates]

Explanatory variables	DI only			Concurrent			SSI only		
	1980-93	1980-87	1988-93	1980-93	1980-87	1988-93	1980-93	1980-87	1988-93
Time effects									
1981	-0.052*	-0.083*	(5)	-0.056*	-0.100*	(5)	-0.025	-0.057*	(5)
	(-4.29)	(-5.29)	(5)	(-2.60)	(-3.84)	(5)	(-1.45)	(-2.65)	(5)
1982	-.017	-.013	(5)	-.053*	-.037	(5)	-.007	.004	(5)
	(-1.30)	(-.83)	(5)	(-2.49)	(-1.49)	(5)	(-.41)	(.18)	(5)
1983	.120*	.120*	(5)	.218*	.220*	(5)	.168*	.168*	(5)
	(10.62)	(8.82)	(5)	(11.64)	(9.83)	(5)	(11.35)	(9.25)	(5)
1984	.110*	.096*	(5)	.193*	.160*	(5)	.136*	.111*	(5)
	(8.96)	(6.25)	(5)	(9.59)	(6.40)	(5)	(8.62)	(5.51)	(5)
1985	.007	.020	(5)	.011	.017	(5)	-.022	-.018	(5)
	(.67)	(1.45)	(5)	(.62)	(.85)	(5)	(-1.59)	(-1.03)	(5)
1986	.021	.025	(5)	.098*	.090*	(5)	.064*	.060*	(5)
	(1.92)	(1.93)	(5)	(5.70)	(4.69)	(5)	(4.66)	(3.67)	(5)
1987	-.057*	-.063*	(5)	-.131*	-.150*	(5)	-.115*	-.126*	(5)
	(-5.67)	(-5.30)	(5)	(-7.79)	(-7.86)	(5)	(-8.75)	(-8.34)	(5)
1988	-.041*	(5)	(5)	-.062*	(5)	(5)	-.071*	(5)	(5)
	(-4.06)	(5)	(5)	(-3.77)	(5)	(5)	(-5.48)	(5)	(5)
1989	.002	(5)	.010	.004	(5)	.003	-.009	(5)	-.001
	(.25)	(5)	(1.19)	(.26)	(5)	(.22)	(-.68)	(5)	(-.10)
1990	.009	(5)	.022*	.037*	(5)	.044*	.077*	(5)	.087*
	(.87)	(5)	(2.61)	(2.31)	(5)	(3.34)	(6.15)	(5)	(8.05)
1991	.079*	(5)	.102*	.061*	(5)	.068*	.093*	(5)	.091*
	(7.79)	(5)	(11.04)	(3.78)	(5)	(4.97)	(7.38)	(5)	(8.60)
1992	.059*	(5)	.071*	.088*	(5)	.094*	.064*	(5)	.070*
	(5.93)	(5)	(9.02)	(5.00)	(5)	(5.24)	(4.65)	(5)	(5.11)
1993	-.088*	(5)	-.075*	-.158*	(5)	-.105*	-.126*	(5)	-.071*
	(-7.17)	(5)	(-6.95)	(-7.58)	(5)	(-5.85)	(-7.48)	(5)	(-5.03)

T-values are in parentheses.

* Significant at the .05 level.

[1] See Lewin-VHI (1995d), exhibit III.A.1 for variable definitions.

[2] Variable is in logarithms.

[3] Variable is age adjusted.

[4] Coefficient reported is the sum of the current and lagged coefficients.

[5] Variable not included.

Source: Lewin-VHI analysis of SSA data on initial disability determinations, using data for all 50 States and the District of Columbia.

Table IV.—Decomposition of the growth in applications and awards, 1988-92[1]

Applications and awards	Change in annual applications or awards, 1988-92		Predicted annual growth rate	Predicted annual growth rate accounted for by--							Share of growth accounted for
	Level	Average annual growth rate		Population growth and aging	Unemployment rate	GA program cuts	AIDS/HIV	IRCA legalizations	Children in single parent families	Interaction	
Applications:											
DI total	329,369	8.9	4.1	1.3	1.7	0.1	0.5	(2)	0.3	0.2	46
Men	182,649	7.9	5.0	1.3	2.2	.1	.9	(2)	.2	.3	63
Women	146,720	10.5	2.6	1.3	.9	(2)	(2)	(2)	.4	.1	25
SSI total	434,274	10.5	4.3	1.2	1.1	.6	.4	0.2	.6	.2	41
Men	227,938	10.7	5.4	1.2	1.6	.7	.9	.2	.5	.3	50
Women	206,336	10.3	3.0	1.1	.6	.4	(2)	.2	.6	.1	30
Awards:											
DI total	197,569	10.0	2.3	1.0	1.0	.1	.1	(2)	.0	.1	23
Men	110,971	8.8	2.8	1.1	1.4	.1	.1	(2)	-.1	.1	31
Women	86,598	12.1	1.3	1.0	.3	(2)	(2)	(2)	.0	.0	11
SSI total	234,393	12.0	.9	1.1	.7	.6	-.5	-1.0	.2	-.1	7
Men	115,059	12.2	.7	1.1	.9	.6	-1.0	-1.0	.2	-.1	6
Women	109,334	11.8	1.1	1.0	.5	.5	(2)	-1.0	.1	-.1	9

[1] Source: Simulations based on regression analysis of State data for 1988 and 1992.

[2] Not applicable.