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Articles

Disability Benefit Coverage and Program Interactions in the Working-Age Population

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Summary

Over three-fourths of the working-age population in the United States is insured for Disability Insurance (DI); this group is protected against a total loss of earned income typically associated with severe disability. However, little is known about the role the Supplemental Security Income (SSI) program plays in protecting against the financial consequences of severe disability for this population. We find that over one-third (36 percent) of the working-age population is covered by SSI in the event of a severe disability. Three important implications follow, which we discuss in sequence below: (1) SSI increases the overall coverage of the working-age population; (2) SSI enhances the bundle of cash benefits available to disabled individuals; and (3) interactions with other programs also enhance the safety net, most notably in the area of health insurance coverage. Ignoring these implications could lead to inaccurate inferences about disability program coverage, health insurance coverage, and the well-being of working-age individuals with disabilities.

The first major finding is that SSI substantially increases overall cash benefit coverage. Thus SSI dramatically increases protection against the financial risk of disablement in the working-age population. While roughly 23 percent of the U.S. working-age population was not insured for DI in November 1996, SSI provides coverage for more than half of this seemingly "uncovered" population. An important innovation of our analysis is that we account for the possibility that many of those who appear ineligible for SSI based on current income could become eligible as a result of a disability shock that causes their earnings to drop. Thus the estimated proportion that is protected by SSI increases when the possibility of earnings loss because of disability is considered.

Considering DI and SSI together, roughly 90 percent of the working-age population would be potentially covered for benefits in the event of a disability. Those who are covered by SSI—as opposed to those covered by DI alone—tend to be relatively young, less educated, and in relatively poor health. The remaining 10 percent or so are not covered by either DI or SSI. This group is economically vulnerable in some sense (they are poorer, older, and more likely to be women than those covered only by DI), but they are not as economically vulnerable in terms of income, resource holdings, and private health insurance coverage as those who are eligible for SSI. A disproportionate share of those who are not covered by either DI or SSI consists of married women.

The second major finding is that SSI substantially enhances the bundle of available cash benefits. Roughly one-third of those covered by DI are initially covered by SSI as well. SSI enhances the bundle of available cash benefits through two mechanisms: (1) SSI provides cash payments during the 5-month DI waiting period, and (2) SSI supplements the DI benefit after the DI waiting period for people whose initial SSI payment is larger than the DI benefit.

We find that the role of SSI cash payments is temporary for most of those who are initially covered by both SSI and DI: They would receive SSI during the DI waiting period, but would lose SSI eligibility afterwards because the higher DI benefit completely offsets the SSI benefit. However, a smaller group of DI beneficiaries with low DI benefit levels would continue to be covered by both SSI and DI after the DI waiting period because the relatively low DI benefit would not completely offset the SSI benefit.

The third major finding is that interactions with other programs also substantially enhance the safety net. The most important interactions involve health insurance coverage. In the working-age population, Medicare is available to DI beneficiaries, but only after a 24-month waiting period. By contrast, SSI is an important pathway to Medicaid benefits for severely disabled adults with limited income and resources and has no waiting period. SSI can provide a pathway to health insurance coverage during the 24-month Medicare waiting period for some DI beneficiaries through providing access to Medicaid.

Interactions with other programs, such as Temporary Assistance for Needy Families (TANF), Food Stamp, Unemployment Insurance (UI), workers' compensation (WC), and veterans' disability programs, modify the role of DI and SSI in protecting people against the adverse financial effects of disablement. The nature of the interactions with other programs differs depending on individual circumstances. Employment-related programs (including UI, WC, and veteran's disability programs) are particularly important for those who are covered by DI. By contrast, the means-tested programs (including TANF and Food Stamp) are more important for those who would be eligible for SSI.

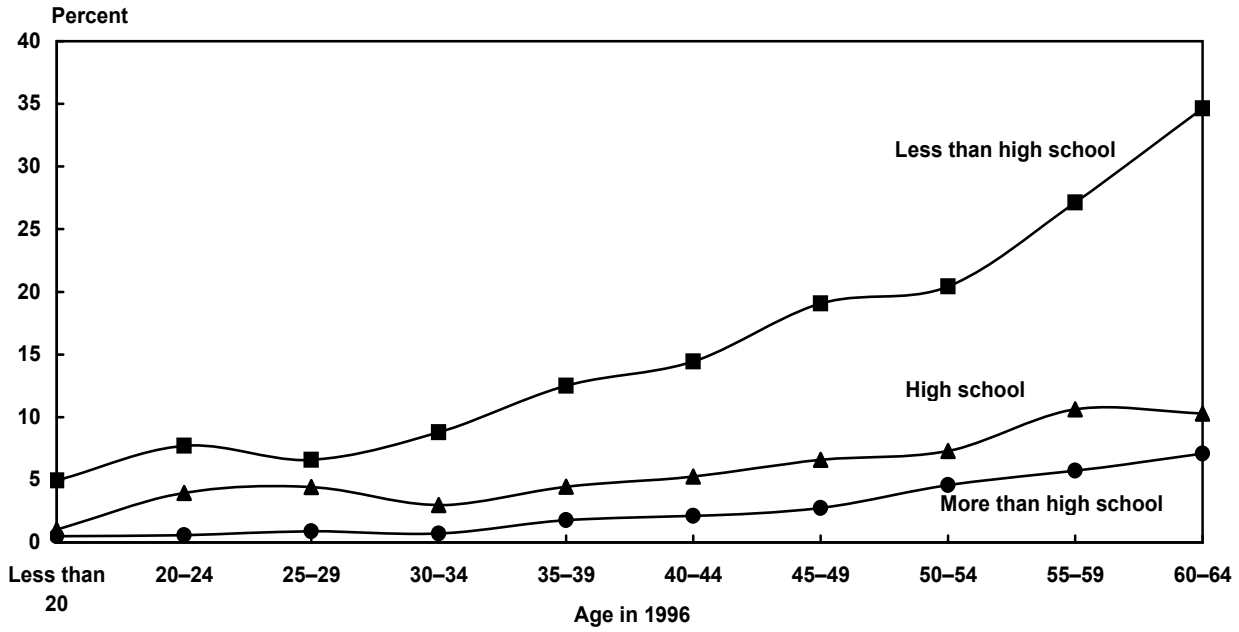
In conclusion, SSI plays a substantial role in protecting working-age people against the adverse financial consequences of disablement through three mechanisms: (1) providing coverage to many who are not DI insured; (2) providing additional cash benefits to many who are DI insured and also covered by SSI; and (3) enhancing the social safety net by interacting with other programs, most notably Medicaid. Through these mechanisms, the role of SSI is substantial enough that it cannot be safely ignored in econometric and policy research on DI.

Introduction

This article analyzes the role of the Supplemental Security Income (SSI) and Social Security Disability Insurance (DI) programs in protecting the working-age population against the adverse financial consequences of becoming disabled. Our focus is not limited to current participants in these two major disability programs administered by the Social Security Administration (SSA). We take a broader view. We are interested in the extent to which these two programs insure against the financial consequences of disability for the entire working-age population in the United States, most of whom currently are neither disabled nor SSI or DI participants. Adapting a term frequently used in the health care financing literature—insurance coverage—our focus here is "disability benefit coverage." Specifically, we are focusing on the coverage provided by the two major public disability programs in the United States: DI and SSI. We define a person as "covered" by DI if the person is "DI insured." Likewise, a person is "covered" by SSI for the working-aged if he or she meets the SSI income and resource screen in the event of potential disablement and meets citizenship and residency requirements. Note that this concept of "coverage" is broader than the concept of program participation. In fact, the bulk of those who are covered by SSI or DI are not current participants because they either have not applied for one or both, or have applied but do not currently meet the strict disability definition of these programs.

The risk of becoming disabled faced by the working-age population is difficult to determine; however, some information is given by observed patterns of DI and SSI participation over the working-age portion of the life cycle. Chart 1 shows the proportion of individuals in different age groups that has ever participated in DI or SSI by 1996.[1] The chart shows how the proportions vary by educational attainment. The risk of participation increases with age for all education-level groups, but the increase is most striking for those with less than a high school education. Among those aged 60–64 in 1996, nearly 35 percent had at some point participated in the DI or SSI program during their lifetime. These data suggest that the risk of disablement during the working-age years may

Chart 1.
Percent ever participated in DI/SSI by November 1996 among subgroups, by educational attainment and age



SOURCE: Survey of Income and Program Participation matched to Social Security Administration administrative records, November 1996.
NOTE: DI = Disability Insurance; SSI = Supplemental Security Income.

be substantial. Thus it is important to learn about the degree to which the working-age population is protected against the financial risks of disablement. This very issue is the focus of our article.

The size of the population that is currently covered by the DI program against the financial consequences of becoming disabled, called the "DI-insured population," is routinely estimated by the Social Security Administration. In contrast, there have been no previous studies to estimate the size and characteristics of the working-age population that is covered by the SSI program. In this study we provide the first estimates of the size and characteristics of the working-age population that is covered by SSI, DI, or both.

The rest of the article is organized as follows. In the next section we provide some programmatic background. The outline of the research questions follows, with a brief assessment of the extent to which they have been addressed by previous literature. This is followed by a description of the data and methodology. The substantive results are presented next, addressing (a) prevalence of DI/SSI coverage, (b) characteristics of population segments defined by patterns of coverage, and (c) access to alternative or complementary safety net protections. Finally, we identify issues for future research.

Programmatic Background

To qualify for DI benefits in the event of disablement one has to be "DI insured." DI-insured status is conditioned on the history of covered earnings. In general, DI-insured status requires both 20 quarters of coverage in the previous 10 years and a quarter of coverage for each year after the person reaches age 21.[2] The former requirement is modified for people younger than age 31, but generally follows the pattern of requiring one quarter of coverage for each two calendar quarters that have elapsed since the age of 21. A quarter of coverage is currently defined as a specific amount of earnings and was equivalent to $640 in 1996. Importantly, the DI program is not means tested.

The SSI program provides income support for some economically vulnerable aged, disabled, or blind persons and couples. In contrast to DI, SSI is means-tested: Program rules include an income and resource test. Federal SSI payments are calculated as the difference between the federal benefit rate (FBR) and countable income.[3] All elderly persons satisfying the financial eligibility rules are categorically eligible for

SSI payments. In contrast, working-age persons need to meet SSA's disability screen as well to qualify.

The SSI disability screen for the working-aged is identical to the screen used for the DI program. Under both programs, for a person to be considered disabled, he or she should not be able to engage in any substantial gainful activity (SGA)[4] because of a medically determined impairment that is expected either to result in death or last for at least 12 months. The impairment must be the primary reason for the inability to engage in SGA. This is a strict definition of disability in that the person must be not only unable to do previous work, but also any other type of work considering age, education, and work experience. It does not matter whether such work exists in the person's immediate area, whether there is a job vacancy, or whether the individual would be hired.

Although SSI payments have no effect on DI benefits, Social Security (Old-Age, Survivors, and Disability Insurance, or OASDI), is treated as countable income by SSI. Thus in most cases DI benefits reduce the size of SSI payments the person (or couple) would otherwise be financially eligible for on a dollar-for-dollar basis.[5] Interactions between SSI and OASDI also arise from other program features. Specifically, SSI payments start immediately upon meeting the means-test criteria and qualifying as categorically disabled, and DI benefits only begin after a 5-month waiting period from disability onset. Likewise, although SSI awardees in most cases immediately qualify for Medicaid,[6] there is a 24-month Medicare waiting period following entitlement to benefits among DI awardees. In fact, this may be better described as a 29-month waiting period because the 5-month DI waiting period and the 24-month Medicare waiting period are additive. Thus, SSI cash payments and associated Medicaid eligibility may enhance the DI safety net. The timing of applications and awards may also affect the potential benefits available from the different programs. For example, if the application occurs months after the onset of qualifying disabilities, DI benefits may be retroactively awarded for a period up to 12 months before the application date. By contrast, retroactive payments are not allowed for months before application in the SSI program.[7] The timing of final award decisions also affects the de facto availability of benefits. The wait for an award decision can be quite lengthy. For example, successful appeals of denials may take 500 days or more and result in retroactive lump-sum payments. According to SSA, the agency performance target for average processing time for hearing decisions was 524 days for fiscal year (FY) 2007, with an average of 541 days projected for FY 2008 (SSA 2007b).

Both the size of the DI program and the disability component of the SSI program have increased since the 1970s. From 1975 through 2005, the number of DI beneficiaries increased from 2.5 million to 6.5 million. Similarly, the number of working-age SSI recipients (including both disabled and blind) increased from 1.8 million to 4.1 million over the same period. In contrast, the aged component of the SSI program has been decreasing in size; the number of SSI recipients aged 65 or older decreased from 2.5 million to 2 million over this period.[8]

Research Questions and Previous Literature

The purpose of this article is to fill a gap in the literature by addressing the role of SSI in supplementing DI in terms of population coverage and the bundle of benefits available in case of severe disablement. We address three specific research questions focusing on (1) coverage provided by the SSI and DI programs in the working-age population, (2) characteristics of subpopulations identified by various patterns of access to SSI and/or DI, and (3) access to alternative or complementary safety net protections. We discuss each of these briefly here.

Our first research question addresses the relative size of the working-age population that is covered by the SSI and DI programs in the event of disablement. Specifically, we are interested in SSI's role in providing coverage for some people who are not currently DI-insured. In addition, we are interested in the role of SSI in enhancing cash benefits among those who have access to both SSI and DI. We also briefly explore the overall importance of these safety net protections during different time horizons using a 10-year follow-up window. This angle—the probability distribution of the risk of disablement—is relevant in that the overall value of safety net protections is a multiplicative function of three factors: the probability of coverage, the value of the benefit bundle conditional on coverage, and the probability of disablement conditional on coverage. The second research question addresses how the characteristics of the subpopulations defined by various patterns of DI and/or SSI coverage differ in terms of demographics, health and disabilities, and economic well-being. Our third research question addresses access to alternative or complementary safety net protections. We are particularly interested

in (1) access to other sources of cash income in the event of disablement and (2) access to Medicaid and Medicare, as well as other sources of health insurance. The role of Medicaid is of particular importance here. SSI may enhance the safety net for the DI-insured not only directly (cash payments), but also indirectly, through facilitating access to Medicaid.

This analysis fills an important gap in the research literature by focusing on the role of SSI and how it complements DI. Previous studies tend to concentrate on either one program or the other. For example, there have been excellent overviews of the DI program, such as that by Bound and Burkhauser (1999), but this literature has largely ignored SSI. Another gap filled by our article is its focus on SSI for working-age disabled persons. Most previous SSI studies have focused primarily on the elderly, such as those of McGarry (1996, 2002), Davies (2002), Davies and others (2002, 2004), and Rupp, Strand, and Davies (2003).

However, while the literature is sparse, there are a few previous studies with more direct relevance to the subject of our article. Mitchell and Phillips (2000, 2001) provide interesting analyses of the vulnerability to potential disablement among the working-age population, particularly the near elderly, by analyzing factors affecting DI-insured status or the lack of it. However, they do not explicitly account for the role of SSI. Rupp and Scott (1998) provide the first estimate of SSI financial eligibility among the working-age population and analyze some interactions between SSI and DI. Rupp and Davies (2004) look at the role of SSI and DI in providing a safety net for economically vulnerable segments of the working-age population and find that SSA's disability programs play a much larger role over the individual life cycle than one might infer from cross-sectional rates of participation. Meyer and Mok (2006) also provide a life-cycle perspective, analyzing the relationship between disability event history, earnings, income, and consumption.

Burkhauser and Wittenburg (1996) look at interactions between DI, SSI, and other disability programs, as well as Medicaid and Medicare. Honeycutt (2004) analyzes program and benefit paths to DI. Gruber and Kubik (2002) focus on the role of health insurance coverage in the DI application decision. Riley (2006) analyzes the role of Medicaid during the 24-month Medicare waiting period. Foote and Hogan (2001) and Riley, Lubitz, and Zhang (2003) also focus on health care, disabilities, and health care cost among working-age Medicare beneficiaries.

Our study builds on previous efforts that analyze the role of SSI and DI as safety net protections for the working-age population by comprehensively looking at the interactions between the two programs in providing coverage for disablement. Thus, our article breaks new ground in terms of estimating the size and characteristics of the working-age population covered by SSA's two disability programs, as well as by taking a broader view of important program interactions, most notably with Medicaid and Medicare.

Data and Methodology

The source of data for this study is the 1996 panel of the Survey of Income and Program Participation (SIPP) matched at the individual level to Social Security administrative records. The analysis sample is limited to persons aged 18–64 in the United States noninstitutional population in November 1996. The source of date of death is SSA's Social Security number identification (Numident) system.[9] DI and SSI beneficiary status is defined on the basis of current payment status in November 1996 using information from SSA's Master Beneficiary Record (MBR) and the Supplemental Security Record (SSR). The data are weighted to account for the complex SIPP sample design and for the lack of valid Social Security numbers for some SIPP sample members. The weighted estimates are designed to provide unbiased estimates of the relevant population values. We calculate standard error estimates that use a simple adjustment to account for the complex SIPP sample design effect (DEFF).[10]

Our research methodology is based on three components:

1. Measuring SSI financial eligibility status and DI-insured status using the SSA Office of Retirement and Disability Policy's Financial Eligibility Model (FEM),
2. Modifying the FEM to account for the role of own earnings in establishing both categorical and SSI financial eligibility for the working-age population, and
3. Modifying the concept of concurrent DI and SSI coverage to account for the dynamic interaction of the two programs arising from the 5-month DI waiting period.

Next, we briefly address the first of these components, which is a relatively simple adaptation of methods that have been used in other studies, and then

discuss the last two, more innovative, aspects of our methodology in greater detail.

Measurement of SSI Financial Eligibility Status and DI-Insured Status

The establishment of SSI financial eligibility status is based on a modified version of the FEM, which is a static simulation model focusing on SSI financial eligibility, participation, and the assessment of various SSI policy options. The key elements of the FEM are described in Davies and others (2002). The basic structure of the FEM is similar to the SSI model that was developed by McGarry (1996, 2002) except that the FEM utilizes administrative records matched to the survey data and contains a more detailed algorithm to establish SSI financial eligibility. The previous applications of the FEM have focused on the elderly. A key element of the FEM—as applied to the aged—is a financial eligibility calculator that estimates potential SSI income and resource eligibility for any sample member regardless of actual program participation. The eligibility calculator is based on detailed SSI income and resource eligibility rules applied to survey data on income and assets from the SIPP.[11] For those persons deemed financially eligible for SSI, the FEM calculates expected (hypothetical) federal SSI payments based on the applicable federal benefit rate (individual or couple unit) and countable income from the SIPP.[12]

We modified the FEM to add a DI benefit calculator that applies Social Security program rules to each sample member's earnings history as reflected in the Summary Earnings Record. The calculator establishes DI-insured status and computes expected (hypothetical) DI benefit amounts for all sample members aged 18–64, regardless of actual program participation. The calculator mimics program rules in determining DI-insured status based on "quarters of coverage." We note that DI-insured status and categorical eligibility as disabled are totally independent variables, which contrasts with the SSI program, where financial eligibility and categorical eligibility based on disability are interrelated. We explain this difference below.

The Substantial Gainful Activity Test and SSI Financial Eligibility

Our first innovation is to account for the role of own earnings in establishing SSI coverage among the working-age population. The relationship between the financial and categorical eligibility variables needs to be carefully considered for the working-age population. Among the elderly, SSI financial eligibility is independent of categorical eligibility, since all elderly citizens of the United States who meet minimum residency requirements are categorically eligible for SSI. In contrast, among the working-age population, the reference person's *own* earnings affect both SSI income eligibility and categorical eligibility as disabled in the initial eligibility determination because of the SGA test. The SGA test results in the presumptive denial of disability benefits for applicants with *own* earnings higher than the SGA threshold. As we explain below, this interdependence of the two eligibility screens warrants a modification of the SSI financial eligibility algorithm.

To address the role of SGA-level *own* earnings in affecting SSI financial eligibility, we construct two distinct measures of eligibility. Both measures use the same basis for determining resource eligibility but differ in the measurement of income eligibility. One is the conventional measure of income eligibility based on *current* countable income, which reflects income eligibility that is conditional on current earnings observed for the reference month. Our second measure is designed to capture *potential* income eligibility in the hypothetical event of categorically qualifying disablement. We conservatively assume that *own* earnings under this second scenario are "*SGA-constrained*." For people whose *current* earnings are below SGA, there is no difference between "current" and "potential" SSI income eligibility. For people whose *current* earnings are above SGA, a potential disability shock severe enough to result in categorical eligibility as disabled requires a drop in *own* earnings to below-SGA levels. This earnings drop, in turn, might result in potential SSI income eligibility for people whose (predisability) current earnings would result in failure to meet the income test.[13] Our "*potential SSI financial eligibility*" measure simply reflects hypothetical SSI income eligibility that is conditional on SGA-constrained *own* earnings combined with the conventional measure of resource eligibility.

In this recalculation we assume all other sources of income and resources are unchanged. Thus, we assume away potential changes in spousal labor supply, spend down of resources, qualifying and starting to receive employer-sponsored pension benefits, and so on. The various topics are all worthy of further research, but we believe that the shift to SGA-constrained earnings is distinct in that it is directly related to the SSA definition of categorical disability and also to SSI income eligibility. Therefore, it is of primary importance. In

the remainder of this article, unless otherwise stated, the term "SSI eligible" refers to people who are "covered" by the SSI program in the sense that their potential income under the assumption of SGA-constrained earnings would qualify them for SSI in the event of severe disablement.

Our approach is supported by some early findings from an emerging literature on the various effects of "health shocks" that use longitudinal data that are better suited to consider complex interactions. Coile (2004), for example, finds that health shocks result in dramatic reduction of the labor supply of the affected worker, but finds that the hypothesized spousal "added-worker effect" is small for men, and finds no evidence for women. Coile notes that the direction of the spousal labor supply effect is ambiguous for a variety of reasons including complementarity of spousal leisure and home production in the form of caregiving.

The 5-Month DI Waiting Period and Dynamic Program Interactions: Serial and Joint Eligibility

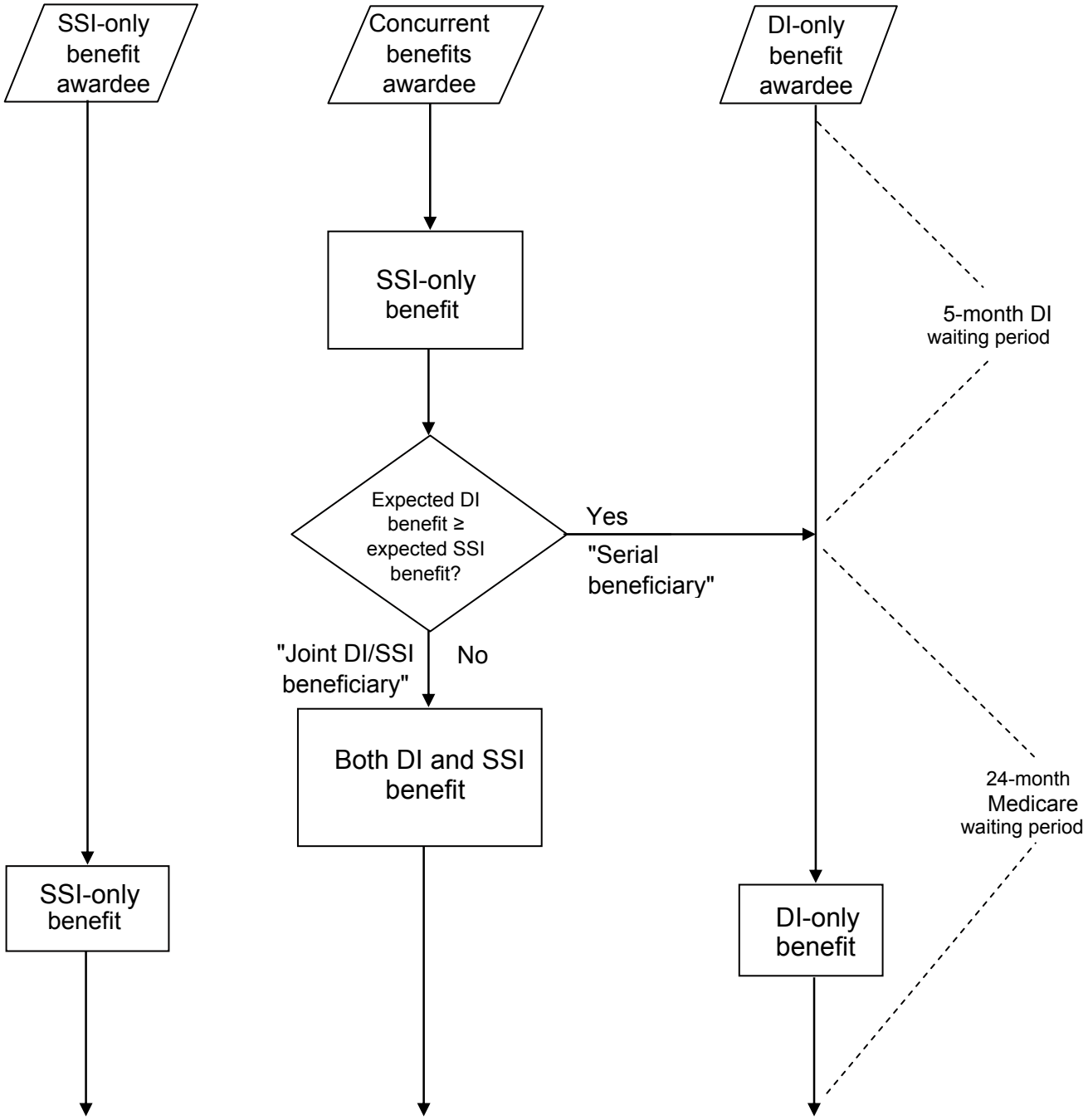
Our second methodological innovation is warranted by the existence of the 5-month DI waiting period, which complicates the determination of SSI financial eligibility because DI benefits need to be considered in establishing income eligibility for SSI. Thus SSI financial eligibility status may be different during the 5-month DI waiting period than after DI benefits begin. SSI coverage is relevant in terms of the value of safety net protections not only because of the potential SSI cash payment during the 5-month DI waiting period and beyond, but also because of the possibility of Medicaid coverage both during the 5-month DI waiting period and during the subsequent 24-month Medicare waiting period. SSI recipients are categorically eligible for Medicaid under most circumstances. In addition, Medicaid eligibility may continue even if SSI benefits discontinue as a result of DI benefits that may begin after the 5-month waiting period. For these reasons, we have considered the dynamic relationship between the 5-month DI waiting period and SSI financial eligibility in developing a refined classification of "concurrent" DI and SSI eligibility.

To address these interactions we consider what happens after the initial determination of eligibility to receive DI and SSI benefits. Because the categorical eligibility criteria are identical for the two programs (except for a lack of the SGA test for SSI blind individuals), a single process determines categorical eligibility as disabled. As Chart 2 shows, those persons who pass the SSA disability screen can be sorted into three groups by financial eligibility for SSI and DI benefits: SSI-only, concurrent, and DI-only. Assuming acceptance of SSI payments among those eligible and no changes other than the passage of time after initial award,[14] the chart shows the dynamic relationships in the benefit determination process. The financial eligibility and expected SSI payments of SSI-only awardees (left side of chart) are unaffected by the 5-month DI waiting period: SSI-only payments are to be rendered immediately following the onset of a qualifying disability. In contrast, DI-only awardees (right side) do not receive any disability benefits during the first 5-months after onset of disability, and receive DI-only benefits afterward.

The situation is more complex for concurrent benefit awardees (middle panel). For simplicity we ignore the fact that up to $20 a month of DI benefits may be excluded in the determination of SSI payments.[15] Concurrent awardees receive SSI-only payments during the 5-month waiting period, after which time, however, eligibility status and payment amounts are recalculated. Because DI benefits are completely offset in the SSI income eligibility determination, if expected DI benefits are greater than or equal to expected SSI payments (assuming the absence of DI), SSI payments stop as DI benefits begin after the 5-month DI waiting period. We call these people "serial beneficiaries" because they transition from SSI to DI beneficiary status. If the expected DI benefit is positive but less than the expected SSI payment, a reduced SSI payment reflecting the dollar-for-dollar DI offset continues after the 5-month DI waiting period. In effect, the person continues to receive combined cash benefits from the two programs that are equal to the SSI payment during the DI waiting period.[16] We refer to this second subgroup of concurrent beneficiaries as "joint beneficiaries."

An important caveat in interpreting Chart 2 is that it assumes disability application immediately upon the onset of a qualifying disability. However, unpublished Office of Retirement and Disability Policy tabulations and preliminary results from ongoing research indicate that this assumption may not hold in many cases. The implications differ by type of coverage. As noted previously, SSI rules prohibit retroactive payments for months before disability application and therefore potential SSI benefits are in effect forfeited. In contrast, DI benefits are payable for up to 12 months before application depending on the date of disability onset established by SSA. As a consequence, the por-

Chart 2.
Simplified DI and SSI benefit stream determination conditional on passing the SSA disability screen



SOURCE: Authors.

NOTE: DI = Disability Insurance; SSI = Supplemental Security Income; SSA = Social Security Administration.

tion of the DI waiting period for the post application period may be reduced or completely eliminated. This implies that the length of *serial* beneficiary status is reduced, or the applicant appears as DI-only as a result of forfeiting potential SSI payments because of the late date of application.

While Chart 2 illustrates what happens conditional on the establishment of categorical eligibility as disabled and benefit award, the underlying principles also can be used to classify current nonparticipants by coverage-status categories. We assign each sample member into one of the following five potential coverage-status categories:

1. DI-only coverage,
2. Serial SSI/DI coverage,
3. Joint SSI/DI coverage,[17]
4. SSI-only coverage, and
5. Neither DI nor SSI coverage.

The importance of distinguishing these five groups arises because they represent different patterns of cash safety net coverage. We note that coverage is unaffected by claiming behavior. As a result, the different DI and SSI program rules concerning onset of disability before application have no relevance for the establishment of coverage status. Membership in the five groups may affect the person's status in terms of noncash benefits as well—most notably, access to Medicaid and Medicare.

Empirical Results

In this section we provide empirical results addressing the three major study questions: (1) patterns of DI and SSI coverage, (2) characteristics of the population segments with various patterns of coverage, and (3) access to other safety nets.

Patterns of DI and SSI Coverage

The first column of Table 1 shows the basic results using our preferred, adjusted, potential SSI eligibility definition. According to our estimates, over one-third of working-age persons (36 percent) is covered by SSI.[18] This compares with our estimate that three-fourths (77 percent) of the working-age population is covered by DI.[19] Of course, there is an overlap because some people may be covered by both programs. The first column in the table provides a more detailed view of the distribution of the working-age population, both by DI and SSI coverage. Remarkably, the bulk (about two-thirds) of those who are covered by SSI are also DI insured.[20]

Perhaps most relevant is the combined role of SSI and DI. Mitchell and Phillips (2000) called attention to a substantial gap in DI-insured status among near-elderly men and for women in general. Looking at the working-age population as a whole and incorporating the role of the SSI program, we find that about 90 percent of the working-age population is covered by either or both programs. One way to look at the role of potential SSI financial eligibility is to note that it reduces the proportion of the working-age population that *appears* uncovered based on DI alone from about 25 percent (those who are not DI-insured) to roughly 10 percent. Over half (55 percent) of working-age persons who are not covered by DI[21] are covered by SSI.[22]

An important group is the almost one-quarter (24 percent) of the working-age population that is covered by both programs. For these people SSI enhances the cash safety net protection. As noted in the Data and Methodology section, it is important to distinguish between "serial" and "joint" eligibles because they fundamentally differ in the way that SSI supplements the DI cash benefit. Chart 3 shows the *serial* and *joint* subgroups separately. The vast majority of concurrent eligibles are *serially* eligible for the two programs (21 percent of the total working-age population), in contrast to the relatively small subgroup of *joint* eligibles (3 percent of the total working-age population).

Overall, these findings are consistent with the common view of DI as the main pillar of the safety net against the risk of severe disablement among the working-age population. What is new here is the finding that SSI plays a large role in supplementing this cash safety net in two principal ways: first, by reducing by half the percentage of the working-age population that is not protected against the adverse financial consequences of disablement; and second, by providing for almost one-third of the DI-insured additional SSI income to complement DI income.

Characteristics of Subgroups of Current Nonparticipants by Various Patterns of Coverage

What groups of the working-age population are affected by the availability of DI and/or SSI in the event of a disability? Those who are currently *participating* in either or both of SSA's disability programs are clearly protected, but form only a small fraction

Table 1.
Distribution of individuals aged 18–64, by SSI financial eligibility and DI-insured status based on alternative earnings assumptions, November 1996

SSI financial eligibility and DI-insured status	SSI income eligibility measure	
	Adjusted [a]	Unadjusted [b]
	Percentage distribution [c]	
DI-insured only	53.5	66.6
	(0.4)	(0.3)
SSI-eligible only	12.6	9.3
	(0.2)	(0.2)
Both DI insured and SSI eligible	23.5	10.4
	(0.3)	(0.2)
Neither	10.5	13.7
	(0.2)	(0.2)
Total percent	100.0	100.0
	Percent of total [c]	
SSI eligible, including DI insured	36.1	19.7
	(0.3)	(0.3)
DI insured, including SSI eligible	77.0	77.0
	(0.3)	(0.3)
SSI eligible and/or DI insured	89.6	86.3
	(0.2)	(0.2)
Total number [d]	44,384	44,384

SOURCE: Survey of Income and Program Participation (SIPP) matched to Social Security Administration (SSA) administrative records, November 1996.

NOTES: The universe for Table 1 includes both current participants and nonparticipants.

SSI = Supplemental Security Income; DI = Disability Insurance.

a. Own earnings adjusted to account for substantial gainful activity (SGA) ceiling of the SSA categorical eligibility screen.

b. Own earnings unadjusted for SGA ceiling of the SSA categorical eligibility screen.

c. Weighted. Estimated standard errors in parentheses. The standard error estimates assume a design effect of 2.34 to account for the complex SIPP sample design (see Census Bureau, 2001, Table 4, p. 22).

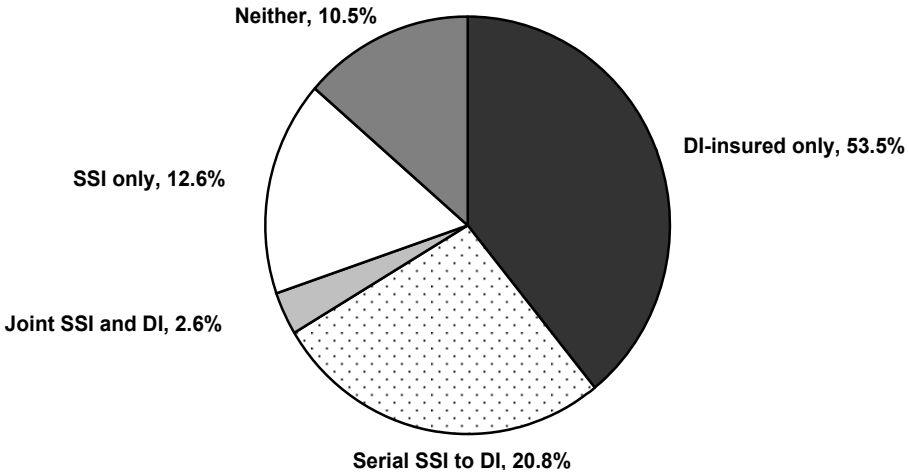
d. Unweighted number of sample observations.

of the working-aged. The bulk of the working-age population consists of current *nonparticipants*. In this section we focus on the characteristics of the nonparticipant population with various patterns of coverage.

Table 2 presents demographic characteristics of the five principal groups of DI and SSI nonparticipants by their patterns of coverage. Four of those groups are covered by DI and/or SSI, and a fifth group consists of people who are not covered by either program.[23] The demographic differences between those groups covered by SSI and/or DI can be understood in the context of associations with life-cycle differences in the attainment of DI-insured status, differences in labor force attachment, and other factors affecting SSI financial eligibility. For example, we can expect people in their twenties to be less likely to be DI-insured than others further ahead in their life cycle and to be the least likely to have accumulated assets above the SSI threshold. Likewise, low levels of education are expected to be associated with relatively weak labor force attachment and relatively low earnings, both increasing the probability of SSI eligibility and either the lack of DI-insured status or expected DI benefits low enough to assure long-term dependence on SSI in the event of potential disability. People with minor children are also expected to be more likely to be financially eligible for SSI than their peers who do not have minor children.

Thus it is not surprising that there is a clear contrast between the two groups that are covered only by one of the two programs. Compared with the group covered by DI alone, those covered only by SSI often are younger, women, nonwhite, unmarried, have less education, and no minor children. All of the relevant

Chart 3.
Percentage distribution of the working-age noninstitutional population, by potential SSI financial eligibility and DI-insured status, November 1996



SOURCE: Survey of Income and Program Participation matched to Social Security Administration administrative records, November 1996.
NOTE: SSI = Supplemental Security Income; DI = Disability Insurance.

subgroup comparisons indicate differences that are statistically significant, and most of them are large. Most of the characteristics listed above are historically associated with relatively low-earning potential (Sohota 1978).

Next we look at the two groups of concurrent eligibles. As expected, all SSI-covered groups tend to be relatively young compared with the DI-only group. Members of the two subgroups of concurrent nonparticipants in most cases have other characteristics that are in-between the DI-only and SSI-only groups. Also as expected, *joint* eligibles are often closer to SSI-only than are *serial* eligibles. They tend to be even younger than the SSI-only group.

An important and interesting group is the one not covered by either the DI or SSI programs. The noncovered group has the highest proportion of women among all of the groups, and—consistent with the findings of Mitchell and Phillips (2001) concerning the decline of DI-insured status among the near elderly—the highest proportion of nonparticipants in the oldest (aged 46–64) age group category. However, the noncovered group is fairly similar to the DI-only group on all other demographic measures. This suggests that an important subset of the noncovered group may include relatively old, predominantly white (non-Hispanic) women with relatively weak labor force attachment who are married to spouses whose earnings and assets may disqualify them from potential SSI financial eligibility. In effect, family resources may provide a nontrivial cushion for these people in the event of potential disablement. The data are also consistent with the hypothesis that others may be economically vulnerable for some of the same reasons that Mitchell and Phillips suggest. Older men and women who lose DI-insured status may have income and resources that marginally disqualify them from potential SSI financial eligibility. All in all, there may be substantial heterogeneity within the category of those who appear unprotected by the DI and/or SSI public cash benefit safety nets in terms of economic vulnerability. In the analyses below we present additional evidence that is directly relevant for the assessment of this internal heterogeneity.

Table 3 provides data on several health, disability, and mortality indicators. The overwhelming impression here is that current nonparticipants tend to have "excellent" or "very good" current health status, and low prevalence of individual disabling conditions and mortality risk (measured by mortality status 4 and 10 years after the survey reference month). There is a striking, but not surprising, contrast between findings from the literature on the health, disability, and mortality risk of *current* disability beneficiaries.[24] Note, however, that the numbers in Table 3 represent popula-

Table 2.
Demographic characteristics of DI and SSI nonparticipants aged 18–64, by potential access to DI and/or SSI, November 1996

Characteristic	Current nonparticipants by potential access to DI and/or SSI [a]				
			Concurrent DI/SSI eligibles		
	DI-insured only	SSI-eligible only	Serial SSI to DI	Joint SSI and DI	Neither DI insured nor SSI eligible
	Percentage distribution [b]				
Age group					
18-30	17.1	58.6	45.6	72.8	16.4
	(0.4)	(1.1)	(0.8)	(2.1)	(0.8)
31-45	47.6	28.2	39.3	18.3	39.5
	(0.5)	(1.0)	(0.8)	(1.8)	(1.1)
46-64	35.3	13.3	15.1	8.9	44.0
	(0.5)	(0.7)	(0.6)	(1.3)	(1.1)
Total	100.0	100.0	100.0	100.0	100.0
Sex					
Women	46.4	61.8	44.5	55.9	70.3
	(0.5)	(1.0)	(0.8)	(2.3)	(1.0)
Men	53.6	38.2	55.5	44.1	29.7
	(0.5)	(1.0)	(0.8)	(2.3)	(1.0)
Total	100.0	100.0	100.0	100.0	100.0
Race/ethnicity					
White, non-Hispanic	85.3	52.8	66.4	61.8	77.7
	(0.4)	(1.1)	(0.8)	(2.3)	(0.9)
Black, non-Hispanic	6.3	19.9	16.5	19.5	6.7
	(0.3)	(0.9)	(0.6)	(1.8)	(0.6)
Hispanic	5.2	20.1	13.7	13.8	8.8
	(0.2)	(0.9)	(0.6)	(1.6)	(0.6)
Other	3.3	7.2	3.4	4.9	6.8
	(0.2)	(0.6)	(0.3)	(1.0)	(0.6)
Total	100.0	100.0	100.0	100.0	100.0
Marital status					
Married	77.7	28.0	31.9	15.0	79.3
	(0.4)	(1.0)	(0.8)	(1.7)	(0.9)
Widowed, divorced, or separated	10.8	15.5	25.2	14.5	7.8
	(0.3)	(0.8)	(0.7)	(1.6)	(0.6)
Never married	11.5	56.5	42.9	70.5	13.0
	(0.3)	(1.1)	(0.8)	(2.1)	(0.8)
Total	100.0	100.0	100.0	100.0	100.0

(Continued)

Table 2.
Continued

Characteristic	Current nonparticipants by potential access to DI and/or SSI [a]				
	DI-insured only	SSI-eligible only	Concurrent DI/SSI eligibles: Serial SSI to DI	Concurrent DI/SSI eligibles: Joint SSI and DI	Neither DI insured nor SSI eligible
	Percentage distribution [b] (cont.)				
Education					
Less than high school	5.0	30.1	14.2	19.7	10.4
	(0.2)	(1.0)	(0.6)	(1.8)	(0.7)
High school graduate	28.6	38.8	39.7	30.6	30.3
	(0.5)	(1.0)	(0.8)	(2.1)	(1.0)
More than high school	66.4	31.2	46.0	49.6	59.3
	(0.5)	(1.0)	(0.8)	(2.3)	(1.1)
Total percent	100.0	100.0	100.0	100.0	100.0
Presence of child under age 18					
Yes	44.8	51.6	41.4	42.1	46.6
	(0.5)	(1.1)	(0.8)	(2.3)	(1.1)
No	55.2	48.5	58.6	57.9	53.4
	(0.5)	(1.1)	(0.8)	(2.3)	(1.1)
Total	100.0	100.0	100.0	100.0	100.0
Total number [c]	21,331	5,117	8,953	1,089	4,586

SOURCE: Survey of Income and Program Participation (SIPP) matched to Social Security Administration (SSA) administrative records, November 1996.

NOTES: The universe for Tables 2 through 6 includes only current nonparticipants; current SSI or DI participants are excluded from the tabulations.

DI = Disability Insurance; SSI = Supplemental Security Income.

a. In the calculation of SSI financial eligibility, own earnings was adjusted to account for the substantial gainful activity ceiling of the SSA categorical eligibility screen.

b. Weighted. Estimated standard errors in parentheses. The standard error estimates assume a design effect of 2.34 to account for the complex SIPP sample design (see Census Bureau, 2001, Table 4, p. 22).

c. Unweighted number of sample observations.

Table 3.
Health, disabilities, and subsequent mortality experience of DI and SSI nonparticipants aged 18–64, by potential access to DI and/or SSI

Characteristic	Current nonparticipants by potential access to DI and/or SSI [a]				
	DI-insured only	SSI-eligible only	Concurrent DI/SSI eligibles: Serial SSI to DI	Concurrent DI/SSI eligibles: Joint SSI and DI	Neither DI insured nor SSI eligible
	Percentage distribution [b]				
Reported health status (reference month)					
Excellent	35.7	31.1	31.0	36.5	31.6
	(0.5)	(1.0)	(0.7)	(2.2)	(1.0)
Very good	36.9	29.8	34.4	30.2	32.8
	(0.5)	(1.0)	(0.8)	(2.1)	(1.1)
Good	21.7	26.0	26.0	20.8	23.6
	(0.4)	(0.9)	(0.7)	(1.9)	(1.0)
Fair	4.9	9.5	7.2	8.9	8.8
	(0.2)	(0.6)	(0.4)	(1.3)	(0.6)
Poor	0.9	3.6	1.4	3.6	3.2
	(0.1)	(0.4)	(0.2)	(0.9)	(0.4)
Total	100.0	100.0	100.0	100.0	100.0
Work-limiting condition, reported in two waves					
Yes	2.1	5.3	2.3	5.6	6.4
	(0.2)	(0.5)	(0.2)	(1.1)	(0.6)
No	97.9	94.7	97.7	94.4	93.6
	(0.2)	(0.5)	(0.2)	(1.1)	(0.6)
Total	100.0	100.0	100.0	100.0	100.0
Work-preventing condition, reported in two waves					
Yes	0.4	3.1	0.7	2.9	3.5
	(0.1)	(0.4)	(0.1)	(0.8)	(0.4)
No	99.6	96.9	99.3	97.1	96.5
	(0.1)	(0.4)	(0.1)	(0.8)	(0.4)
Total	100.0	100.0	100.0	100.0	100.0
Number of reported ADL limitations (reference month)					
None	99.7	99.4	99.7	99.4	99.1
	(0.1)	(0.2)	(0.1)	(0.3)	(0.2)
One	0.1	0.2	0.2	0.3	0.4
	(0.0)	(0.1)	(0.1)	(0.2)	(0.1)
Two or more	0.2	0.4	0.1	0.3	0.6
	(0.0)	(0.1)	(0.1)	(0.3)	(0.2)
Total	100.0	100.0	100.0	100.0	100.0

(Continued)

Table 3.
Continued

Characteristic	Current nonparticipants by potential access to DI and/or SSI [a]				
	DI-insured only	SSI-eligible only	Concurrent DI/SSI eligibles: Serial SSI to DI	Concurrent DI/SSI eligibles: Joint SSI and DI	Neither DI insured nor SSI eligible
	Percentage distribution [b] (cont.)				
Number of reported IADL limitations (reference month)					
None	99.3	98.2	99.4	98.6	98.0
	(0.1)	(0.3)	(0.1)	(0.5)	(0.3)
One	0.4	1.0	0.4	0.7	1.1
	(0.1)	(0.2)	(0.1)	(0.4)	(0.2)
Two or more	0.3	0.8	0.2	0.7	0.9
	(0.1)	(0.2)	(0.1)	(0.4)	(0.2)
Total	100.0	100.0	100.0	100.0	100.0
Number of hospitalizations during previous 12 months					
None	93.0	91.6	93.0	89.2	91.8
	(0.3)	(0.6)	(0.4)	(1.4)	(0.6)
One to five	5.5	6.1	5.5	8.3	6.2
	(0.2)	(0.5)	(0.4)	(1.3)	(0.5)
More than five	1.4	2.3	1.5	2.5	2.0
	(0.1)	(0.3)	(0.2)	(0.7)	(0.3)
Total	100.0	100.0	100.0	100.0	100.0
Number of doctor visits during previous 12 months					
None	21.6	36.1	34.8	30.7	19.6
	(0.4)	(1.0)	(0.8)	(2.1)	(0.9)
One to ten	69.6	55.1	58.0	60.4	69.2
	(0.5)	(1.1)	(0.8)	(2.3)	(1.0)
More than ten	8.9	8.9	7.2	8.9	11.2
	(0.3)	(0.6)	(0.4)	(1.3)	(0.7)
Total	100.0	100.0	100.0	100.0	100.0
Number of disability indicators [c]					
None	81.2	75.3	81.1	74.4	73.8
	(0.4)	(0.9)	(0.6)	(2.0)	(1.0)
One of five	12.8	14.9	12.7	14.4	15.4
	(0.3)	(0.8)	(0.5)	(1.6)	(0.8)
Two or more of five	6.1	9.8	6.3	11.2	10.9
	(0.2)	(0.6)	(0.4)	(1.5)	(0.7)
Total	100.0	100.0	100.0	100.0	100.0

(Continued)

Table 3.
Continued

Characteristic	Current nonparticipants by potential access to DI and/or SSI [a]				
	DI-insured only	SSI-eligible only	Concurrent DI/SSI eligibles: Serial SSI to DI	Concurrent DI/SSI eligibles: Joint SSI and DI	Neither DI insured nor SSI eligible
	Percentage distribution [b] (cont.)				
Mortality status 4 years after survey reference month					
Died by November 2000	0.6	1.0	0.8	0.7	1.3
	(0.1)	(0.2)	(0.1)	(0.4)	(0.3)
Alive in November 2000	99.4	99.1	99.3	99.3	98.7
	(0.1)	(0.2)	(0.1)	(0.4)	(0.3)
Total	100.0	100.0	100.0	100.0	100.0
Mortality status 10 years after survey reference month					
Died by November 2006	2.1	2.6	2.5	1.7	3.6
	(0.2)	(0.3)	(0.3)	(0.6)	(0.4)
Alive in November 2006	97.9	97.4	97.5	98.3	96.4
	(0.2)	(0.3)	(0.3)	(0.6)	(0.4)
Total	100.0	100.0	100.0	100.0	100.0
Total number [d]	21,331	5,117	8,953	1,089	4,586

SOURCE: Survey of Income and Program Participation (SIPP) matched to Social Security Administration (SSA) administrative records, November 1996.

NOTES: DI = Disability Insurance; SSI = Supplemental Security Income; ADL = activities of daily living; IADL = instrumental activities of daily living.

a. In the calculation of SSI financial eligibility own earnings was adjusted to account for the substantial gainful activity ceiling of the SSA categorical eligibility screen.

b. Weighted. Estimated standard errors in parentheses. The standard error estimates assume a design effect of 2.34 to account for the complex SIPP sample design (see Census Bureau, 2001, Table 4, p. 22).

c. Index is sum of the five 0–1 variables. The value "1" is assigned to each of the following: (1) fair or poor self-reported health status; (2) presence of work-preventing or work-limiting condition, reported in two waves; (3) two or more ADL limitations or two or more IADL limitations; (4) hospitalized during previous 12 months; and (5) more than ten doctor visits during previous 12 months.

d. Unweighted number of sample observations.

tion averages for a wide cross-section of the working-age—most of which shows no current sign of serious health problems or disabling conditions, in contrast to a highly select group of beneficiaries defined on the basis of meeting a stringent disability test.

When we look at subgroup differences, SSI-only eligibles tend to be worse off on the various measures of health, disability, and mortality than DI-only eligibles. This is notable, because SSI-only eligibles tend to be much younger than DI-only eligibles. Again, *joint* eligibles tend to be closer to SSI-only eligibles, and *serial* eligibles tend to be closer to DI-only eligibles. However, the members of the noncovered group tend to have somewhat poorer health status and more disabilities than the DI-only group, and in fact are fairly close to the SSI-only group.[25] Keep in mind, however, that the health, disability, and mortality indicators are not adjusted for age differences, and SSI-only eligibles tend to be much younger than DI-only eligibles.

Table 4 presents several indicators of economic well-being, illustrating how the five groups compare in terms of official poverty status (based on the Census Bureau's official poverty thresholds) and asset indicators. There are marked differences here. As expected, the poverty rate based on current income (including observed own earnings)[26] is much higher (35 percent) among those who are SSI-eligible only than among those who are DI-insured only (3 percent). *Joint*

Table 4.
Economic well-being of DI and SSI nonparticipants aged 18–64, by potential access to DI and/or SSI, November 1996

Characteristic	Current nonparticipants by potential access to DI and/or SSI [a]				
	DI-insured only	SSI-eligible only	Concurrent DI/SSI eligibles: Serial SSI to DI	Concurrent DI/SSI eligibles: Joint SSI and DI	Neither DI insured nor SSI eligible
	Percentage distribution [b]				
Observed poverty status					
Poor	3.4	35.0	16.7	39.5	7.7
	(0.2)	(1.0)	(0.6)	(2.3)	(0.6)
Nonpoor	96.6	65.0	83.3	60.5	92.3
	(0.2)	(1.0)	(0.6)	(2.3)	(0.6)
Total percent	100.0	100.0	100.0	100.0	100.0
	Percent of total with characteristics [b]				
Asset indicators					
SSI-countable assets below threshold	9.8	100.0	100.0	100.0	11.8
	(0.3)	(0.0)	(0.0)	(0.0)	(0.7)
Owns car	85.6	41.3	65.4	34.7	82.2
	(0.4)	(1.1)	(0.8)	(2.2)	(0.9)
Owns home	79.5	48.8	51.1	58.9	79.0
	(0.4)	(1.1)	(0.8)	(2.3)	(0.9)
Total number [c]	21,331	5,117	8,953	1,089	4,586

SOURCE: Survey of Income and Program Participation (SIPP) matched to Social Security Administration (SSA) administrative records, November 1996.

NOTES: DI = Disability Insurance; SSI = Supplemental Security Income.

a. In the calculation of SSI financial eligibility, own earnings was adjusted to account for the substantial gainful activity ceiling of the SSA categorical eligibility screen.

b. Weighted. Estimated standard errors in parentheses. The standard error estimates assume a design effect of 2.34 to account for the complex SIPP sample design (see Census Bureau, 2001, Table 4, p. 22).

c. Unweighted number of sample observations.

eligibles have a poverty rate (40 percent) that is even higher than the SSI-only rate, whereas *serial* eligibles have a poverty rate (17 percent) that is clearly lower than the rate for the other two SSI-covered groups, but higher than the rate for the DI-only group. The poverty rate of those who are not covered by either program is 8 percent. This is higher than the poverty rate of the DI-insured only group, but much lower than the poverty rate of the three groups covered by SSI.

When we compare the four groups that are covered by one or both programs by automobile and home ownership (neither of which affect SSI financial eligibility because the primary residence and in most cases one automobile are not countable resources), a key finding is that DI-only eligibles are better off than the three groups covered by SSI. Importantly, the group that is not covered by either program stands out as almost indistinguishable from the DI-only group. This is consistent with our previous findings of similarities between the two groups and our hypothesis that marriage may provide an important link between these two groups of individuals. While home ownership may provide a financial cushion in the event of disablement for anyone, it may be especially important for this "uncovered" group.

Consistent with the patterns we observed previously, the proportion of nonparticipants with countable assets below the SSI thresholds is about the same—roughly 10 percent—for DI-insured only eligibles and those without either DI or SSI coverage.[27] Thus roughly 90 percent in both groups are ineligible for SSI based on their countable resources, regardless of income eligibility. However, the role of this disqualifying factor is very different for the two groups. The DI-only group is by definition "covered," although a small fraction of this group may lose potential SSI enhancements as a result of asset ineligibility. However, failure to meet the (fairly low) SSI asset threshold may be the sole reason for SSI financial ineligibility—and thus the lack of disability benefit coverage altogether—for some among those who are not covered by either DI or SSI.[28] We note that there is substantial room for changes in SSI coverage for these two groups over a longer time-horizon.

Access to Other Programs

Coverage by other programs may increase or reduce the perceived value of DI/SSI coverage. The perceived value may be affected not only by expected cash benefits, but also by other factors such as associated noncash benefits and the length of the award decision period.[29] Table 5 provides information on *current* participation in two means-tested cash-assistance programs (Temporary Assistance for Needy Families (TANF) and Food Stamp) and four employment-related programs. Three of the employment-related programs explicitly condition eligibility on some definition of disability (workers' compensation (WC), veterans' disability benefits, and employer-sponsored disability benefits), although Unemployment Insurance (UI) does not. Estimated participation in all but the two means-tested programs is low. This qualitative conclusion should hold despite possible SIPP undercounting (Meyer and Sullivan 2006). Not surprisingly, TANF and Food Stamp participation is highest among SSI-only eligibles, closely followed by *joint* eligibles. Though the rate of participation in work-related programs is low among DI-only eligibles across the board, the point estimates are higher than for any of the SSI-covered groups.

Table 5 reflects participation in other programs at a given point in time (November 1996). However, from a dynamic perspective these other programs may form a bridge towards DI or SSI *entry*.[30] More detailed data (not tabulated) on participation in the six programs by employment status are suggestive in this regard. For the DI-only subgroup, participation in UI is relatively high (6 percent) among those currently *not* employed. TANF participation among currently *not* employed SSI-only eligibles is 22.3 percent in contrast to 7.6 percent for the currently employed. Food Stamp participation among SSI-only eligibles shows a similar contrast: 34 percent for those *not* currently employed compared with only 16 percent for the currently employed. Participation among those *not* currently employed tends to be relatively high across the board, as we should expect.

A related limitation of the SIPP information is that it refers to observed current participation rather than a broader concept of "access" or coverage. For example, we would like to identify those who are covered by WC or UI, but unfortunately we cannot do so with the SIPP. However, we can rely on aggregate data to gauge coverage by these other programs. For example, in 2004, WC covered 67 percent of the working-age population. The federal/state UI and unemployment compensation for federal employees programs covered 69 percent of the working-age population (authors' calculations based on National Academy of Social Insurance (2006)).[31]

Workers' compensation is both a substitute and complement to the DI program. It is a complement in

Table 5.
Estimated receipt of cash benefits from various programs among DI and SSI nonparticipants aged 18–64, by potential access to DI and/or SSI, November 1996

Program	Current nonparticipants by potential access to DI and/or SSI [a]				
			Concurrent DI/SSI eligibles		
	DI-insured only	SSI-eligible only	Serial SSI to DI	Joint SSI and DI	Neither DI nor SSI
	Percent of total currently receiving [b]				
Temporary Assistance for Needy Families	0.41	14.09	2.85	10.57	1.08
	(0.07)	(0.74)	(0.27)	(1.43)	(0.23)
Food Stamp	1.11	24.08	7.94	20.15	2.70
	(0.11)	(0.91)	(0.44)	(1.86)	(0.37)
Workers' compensation	0.40	0.11	0.09	0.02	1.06
	(0.07)	(0.07)	(0.05)	(0.07)	(0.23)
Veterans' disability benefits	0.92	0.27	0.28	0.00	0.93
	(0.10)	(0.11)	(0.09)	(0.00)	(0.22)
Employer-sponsored disability benefits	0.18	0.02	0.03	0.00	0.25
	(0.04)	(0.03)	(0.03)	(0.00)	(0.11)
Unemployment Insurance	1.39	0.48	0.87	0.28	0.64
	(0.12)	(0.15)	(0.15)	(0.24)	(0.18)
Total number [c]	21,331	5,117	8,953	1,089	4,586

SOURCE: Survey of Income and Program Participation (SIPP) matched to Social Security Administration (SSA) administrative records, November 1996.

NOTES: DI = Disability Insurance; SSI = Supplemental Security Income.

a. In the calculation of SSI financial eligibility, own earnings was adjusted to account for the substantial gainful activity ceiling of the SSA categorical eligibility screen.

b. Weighted. Estimated standard errors in parentheses. The standard error estimates assume a design effect of 2.34 to account for the complex SIPP sample design (see Census Bureau, 2001, Table 4, p. 22).

c. Unweighted number of sample observations.

that people may receive WC during the 5-month DI waiting period and beyond or as a lump-sum payment. Access to WC benefits during the 5-month DI waiting period provides an alternative to SSI among those covered by both DI and SSI. In addition, WC may pay for medical care. DI benefits are offset for WC beneficiaries, which reduces the incentive to apply for DI. Alternatively, an injured person may not file for WC in the anticipation of DI. Workers' compensation coverage is employment-related, so we surmise that it is mostly relevant for the DI-insured and provides virtually no coverage for SSI-only eligibles. Based on a comparison of national coverage rates we infer that some DI-insured are not covered by WC.

Unemployment Insurance is clearly a complement for DI-only eligibles by potentially providing coverage during the 5-month DI waiting period. In contrast, among concurrent SSI/DI eligibles, UI could serve as a substitute for SSI during the DI waiting period. Note that there is an apparent inconsistency between the UI requirement of active job search and availability to work and the need for successful DI applicants to prove inability to work. However, UI can serve as a bridge to DI in some cases. Disablement is a process with uncertain outcomes, and a UI applicant's disability may get progressively worse. Unsuccessful job search can also provide evidence to the potential applicant—and to SSA —of inability to work. Similar to WC, UI is probably not relevant for most SSI-only eligibles because it is conditioned on the presence of a recent period of employment.

A comprehensive analysis of interactions with other cash-assistance programs is beyond the scope of this article. Assessing the interactions of SSI and DI with alternative cash-assistance programs ideally would require an analytic framework and data that support measurement of coverage by all of the relevant programs in a manner similar to our calculation of DI and SSI coverage. Short of such data, one can make some inferences from information on the scope of

coverage, offset provisions, eligibility requirements, and relative attractiveness of potential cash benefits from the various programs. With respect to scope of access, we can hypothesize that interactions with State Disability Insurance (SDI) programs are less important than interactions with workers' compensation, simply because the former are available only in five states. With respect to eligibility requirements, means testing limits TANF and Food Stamp coverage. Further, TANF is also limited to working-age adults with children, and access to veterans' disability benefits are limited to a nontrivial, but small fraction of men and to an even smaller fraction of women. Conditional on meeting program-specific eligibility screens, interactions with other programs will also differ depending on the amount of expected benefits (relatively low in TANF, relatively high in WC); rules limiting receipt of benefits from both programs (the same person cannot simultaneously receive benefits from both TANF and SSI); and benefit offset provisions (DI benefits offset by WC benefits).

Overall, we can reach several broad conclusions. First, although interactions with other cash-assistance programs are important, their overall importance probably does not match the importance of interactions between the SSI and DI programs (Burkhauser and Wittenburg 1996; Honeycutt 2004). Second, other programs can have features of both substitutes and complements, as is the case with WC. Third, some programs (for example, SDI programs and UI) may be a complement to DI but a substitute to SSI for concurrent eligibles during the 5-month DI waiting period. Fourth, the frequent lack of employment experience among SSI-only eligibles[32] makes work-related cash programs less relevant for them compared with those programs' importance for DI eligibles (including concurrents). Fifth, means testing in TANF and the Food Stamp program severely limits access to cash-benefit programs among the DI only. Finally, DI-offset provisions and the SSI income test reduce the relative attractiveness of access to other cash-assistance programs.

Access to Health Insurance

Access to health insurance is an important topic for a number of reasons. Of particular relevance is that SSI awardees are categorically eligible for Medicaid in most cases. Another factor is the 24-month Medicare waiting period for new DI awardees. These program features may increase the incentive to apply for SSI payments. Whether such incentives are important or not, however, critically depends on access to health insurance through other venues.

Table 6 provides the percentage of eligible nonparticipants reporting access to various private or public sources of health insurance and a summary row providing the percentage with access to health insurance from any source. The DI-insured and the SSI-eligible groups provide some clear contrasts. First, about 20 percent of SSI-only eligible nonparticipants are Medicaid beneficiaries, and Medicaid is a negligible source of health insurance for those covered by DI only. The SSI finding suggests that SSI-based access to Medicaid may not be critical for a notable minority of SSI-only eligibles, because they have access to Medicaid through other venues.[33] Second, health insurance through the employer of the reference person is very important for the DI-only group of nonparticipants, though it is relatively unimportant for the SSI-only group. Third, almost one-third of both groups have access to health insurance under someone else's plan. Finally, all except for a small fraction of the DI-only group have access to health insurance from some source, although over one-third of SSI-only eligibles appear to be uninsured.

We note that some DI-only eligibles might lose access to employer-provided health insurance as a result of a potential disability shock, and some SSI-only eligibles might gain eligibility for Medicaid through some non-SSI category of Medicaid eligibility. Still, the contrast between the two groups is suggestive of differential access to health insurance. The data also suggest that lack of access to Medicaid may not be a huge problem for most in the DI-only group, and categorical Medicaid eligibility attributable to SSI may be important only for about a third of SSI-only eligibles who are not currently covered by any health insurance. This is a sizable subgroup, but clearly much less than 100 percent. Nevertheless, the implications of these conclusions are not entirely straightforward, because they are based on cross-sectional data, and disability shocks may be related to changes, such as changes in employment status, that modify access to health insurance. Chart 4 (top panel) shows, for example, that currently employed DI-only eligibles are much more likely to have access to own employer-provided health insurance (70 percent) than those who are not currently employed (26 percent), but access to other private insurance (spouse or dependent coverage) may partially compensate for this.[34] Chart 4 (bottom panel) shows that access to health insurance among SSI-only eligibles through Medicaid and family mem-

Table 6.
Access to health insurance among DI and SSI nonparticipants aged 18–64, by potential access to DI and/or SSI, November 1996

Health insurance status	Current nonparticipants by potential access to DI and/or SSI [a]				
			Concurrent DI/SSI eligibles		
	DI-insured only	SSI-eligible only	Serial SSI to DI	Joint SSI and DI	Neither DI nor SSI
	Percentage distribution [b]				
Health insurance from any source [c]	94.5	63.8	68.6	65.9	89.2
	(0.2)	(1.0)	(0.8)	(2.2)	(0.7)
No health insurance [d]	5.5	36.2	31.4	34.1	10.8
	(0.2)	(1.0)	(0.8)	(2.2)	(0.7)
Total	100.0	100.0	100.0	100.0	100.0
	Percent of total with characteristics [b]				
Medicaid	0.6	20.2	5.3	16.1	2.0
	(0.1)	(0.9)	(0.4)	(1.7)	(0.3)
Medicare	0.2	1.0	0.4	0.8	0.9
	(0.0)	(0.2)	(0.1)	(0.4)	(0.2)
Health insurance in own name, private	4.3	2.7	3.6	4.5	4.2
	(0.2)	(0.3)	(0.3)	(1.0)	(0.5)
Health insurance in own name, employer	63.2	12.1	46.9	6.7	31.1
	(0.5)	(0.7)	(0.8)	(1.2)	(1.0)
Health insurance in own name, military	1.1	0.4	0.9	0.5	0.8
	(0.1)	(0.1)	(0.2)	(0.3)	(0.2)
Health insurance under someone else's plan	32.9	29.5	14.0	38.1	55.2
	(0.5)	(1.0)	(0.6)	(2.3)	(1.1)
Total number [e]	21,331	5,117	8,953	1,089	4,586

SOURCE: Survey of Income and Program Participation (SIPP) matched to Social Security Administration (SSA) administrative records, November 1996.

NOTES: DI = Disability Insurance; SSI = Supplemental Security Income.

a. In the calculation of SSI financial eligibility, own earnings was adjusted to account for the substantial gainful activity ceiling of the SSA categorical eligibility screen.

b. Weighted. Estimated standard errors in parentheses. The standard error estimates assume a design effect of 2.34 to account for the complex SIPP sample design (see Census Bureau, 2001, Table 4, p. 22).

c. Includes people with health insurance from more than one source.

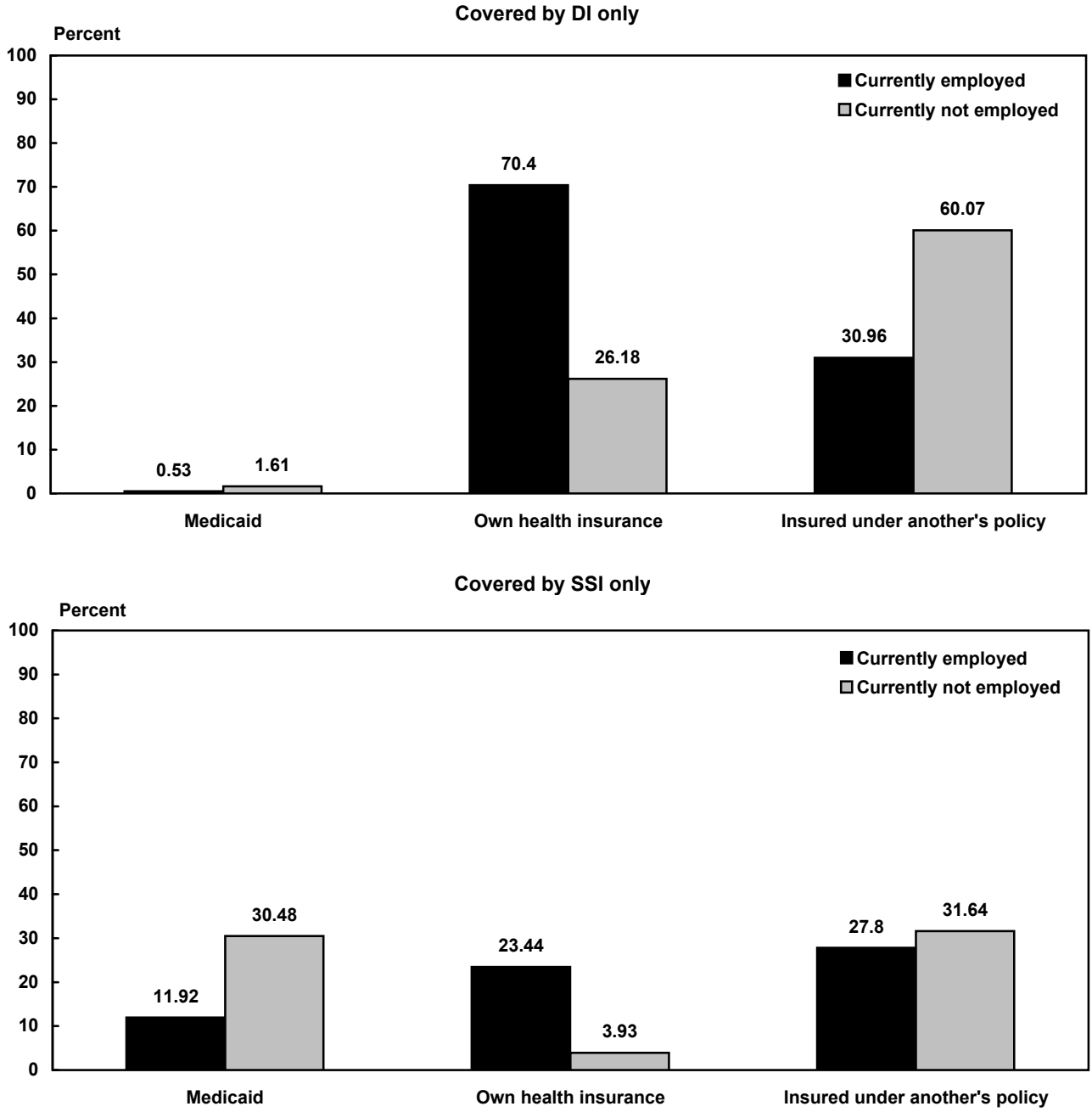
d. No health insurance from any of the six sources listed in bottom panel of table.

e. Unweighted number of sample observations.

bers is higher among those who are not employed than among those who are employed.[35] Among SSI-only eligibles, those who are not currently employed have greater access to Medicaid or health insurance under other people's policies than those who are employed. In contrast to the DI-only group, Medicaid and/or health insurance through family members more than fully compensate for the lower coverage through own health insurance among the not employed.

Generally, the two groups of concurrent eligibles are in between these two contrasting patterns. Importantly, both concurrent groups are fairly similar to the SSI-only eligibles in terms of the percentage uninsured, suggesting that SSI-conditioned Medicaid access may be almost as important for the concurrent groups as for the SSI-only group. Finally, one of the most fascinating findings concerning health insurance coverage is that those who are not covered by either disability program display a very high overall rate of health insurance coverage (89 percent), which is a close second to the DI-only group (95 percent of insurance

Chart 4.
Percent of DI-insured only and SSI-only eligible nonparticipants with health insurance from three major sources, by employment status, November 1996



SOURCE: Survey of Income and Program Participation matched to Social Security Administration administrative records, November 1996.

NOTES: Some persons may have coverage from more than one source; the percentages are not additive.

DI = Disability Insurance; SSI = Supplemental Security Income.

coverage).[36] Interestingly, these two groups contrast in terms of the proportion having health insurance coverage through their own insurance and through a family member. This provides another piece of evidence for the importance of the spouse as a source of safety net protection for some of those who are not covered by either the SSI or DI programs.

Those who are not covered by either SSI or DI are fairly similar to the DI-insured group in terms of overall access to health insurance, but display a somewhat different pattern with respect to the source of health insurance coverage; a family member—most likely a spouse—appears to be the dominant source of health insurance coverage.

Conclusions and Issues for Future Research

In this article we demonstrated that SSI provides coverage for over one-third of the working-age population against the financial risks of severe disablement. SSI supplements the DI safety net in two complementary ways: (1) it reduces the proportion of the working-age population who appear uncovered from about 23 percent to roughly 10 percent, and (2) it enhances the bundle of benefits available for a sizable group who are covered by both DI and SSI (about a quarter of the working-age population). SSI potentially fills a gap by providing temporary cash payments during the 5-month DI waiting period and also by supplementing DI benefits after the waiting period for some. In many states, optional state supplements enhance the role of SSI in complementing DI. In addition, access to Medicaid provides strong incentives to apply for SSI, although preexisting Medicaid eligibility and access to employer-provided health insurance dampens the incentives to apply in many cases. All in all, the role of SSI is substantial enough to question past practice in econometric and policy research on DI that essentially ignores SSI.

In this study we have focused on the potential availability of DI, SSI, and other safety net protections for the working-age population, most of which is currently not participating in either program. The "importance" or "relevance" of these safety net protections for current nonparticipants also depends on the risk of disablement that is severe enough to qualify for SSA's disability programs. Although the introduction gave some information about the retrospective risk of disablement, for those who were never disabled the relevant question is the probability distribution of the risk between the present time period and the time when they would qualify for benefits based on age alone.[37] We can actually observe DI and/or SSI disability program entry during the first 10 years after the survey reference month, based on SSA administrative records. Table 7 provides program entry probabilities for persons aged 18–54 using administrative records after the observation period of the SIPP. The first column shows entry probabilities for the five program coverage groups. The second column shows the overall percent that ever participated between the November 1996 reference month and October 2006. The difference is attributable to the stock of participants during the November 1996 reference month, most of which began program participation earlier. In general, the subgroups with higher cumulative entry probabilities also have higher probabilities of ever participating. Some subgroups of the working-age population have fairly high cumulative entry and participation probabilities. Those with less than high school education and three or more functional limitations stand out on both measures.

Chart 5 shows clear patterns of variation in 10-year trajectories for people aged 18–54 in November 1996, by disability program coverage groups.[38] The dynamic "importance" of the disability safety net varies substantially across subgroups defined by SSI and DI coverage. An important observation here is that disability program participation among those who are currently not eligible for either DI or SSI—although relatively low in comparison with the SSI-covered groups—is slowly moving upwards over time. This points to the importance of dynamic processes—such as asset depletion—that may affect changes in financial eligibility patterns. Chart 6 shows the cumulative entry probabilities over the 10-year follow-up period overall (all persons aged 18–54) and for two subgroups defined by educational attainment and disability status during the reference month, respectively. Similar to the overall average, the trajectory for the subgroups consisting of people with less than a high school education shows a fairly even gradual process of disability program entry. In contrast, people with three or more positive indications of disability in November 1996 have relatively high entry probabilities during the next couple of years. At the end of the 10-year follow-up period, we observe cumulative entry probabilities at more than twice the average (4 percent) for people with less than a high school education (9.5 percent). Almost one-third (32 percent) of people with three or more disability indicators during the reference month are observed to enter one or both disability programs during the same time period. In general, these patterns

Table 7.
Cumulative entry and participation probabilities among individuals aged 18–54 in November 1996, overall and for selected subgroups

Variable	10-year cumulative entry among November 1996 nonparticipants (December 1996 to October 2006)	Ever participated between November 1996 and October 2006
	Percent of total [a]	
All persons	4.0	7.4
	(0.2)	(0.2)
Eligibility group		
DI-insured only	3.4	6.3
	(0.1)	(0.2)
SSI financial-eligible only	6.0	14.3
	(0.2)	(0.3)
Serial SSI/DI	4.9	7.1
	(0.2)	(0.2)
Joint SSI/DI	4.6	11.3
	(0.2)	(0.2)
Neither DI nor SSI	2.7	3.3
	(0.1)	(0.1)
Education		
Less than high school	9.5	19.8
	(0.2)	(0.3)
High school graduate	4.9	8.8
	(0.2)	(0.2)
More than high school	2.6	4.1
	(0.1)	(0.2)
Disability indicators [b]		
None	2.3	2.8
	(0.1)	(0.1)
One or two	8.7	16.7
	(0.2)	(0.3)
Three or more	32.3	63.9
	(0.4)	(0.4)
Total number [c]	37,118	38,540

SOURCE: Survey of Income and Program Participation (SIPP) matched to Social Security Administration administrative records, November 1996.

NOTES: DI = Disability Insurance; SSI = Supplemental Security Income.

a. Weighted. Estimated standard errors in parentheses. The standard error estimates assume a design effect of 2.34 to account for the complex SIPP sample design (see Census Bureau, 2001, Table 4, p. 22).

b. Index is sum of the five 0–1 variables. The value "1" is assigned to each of the following: (1) fair or poor self-reported health status; (2) presence of work-preventing or work-limiting condition, reported in two waves; (3) two or more ADL limitations or two or more IADL limitations; (4) hospitalized during previous 12 months; and (5) more than ten doctor visits during previous 12 months.

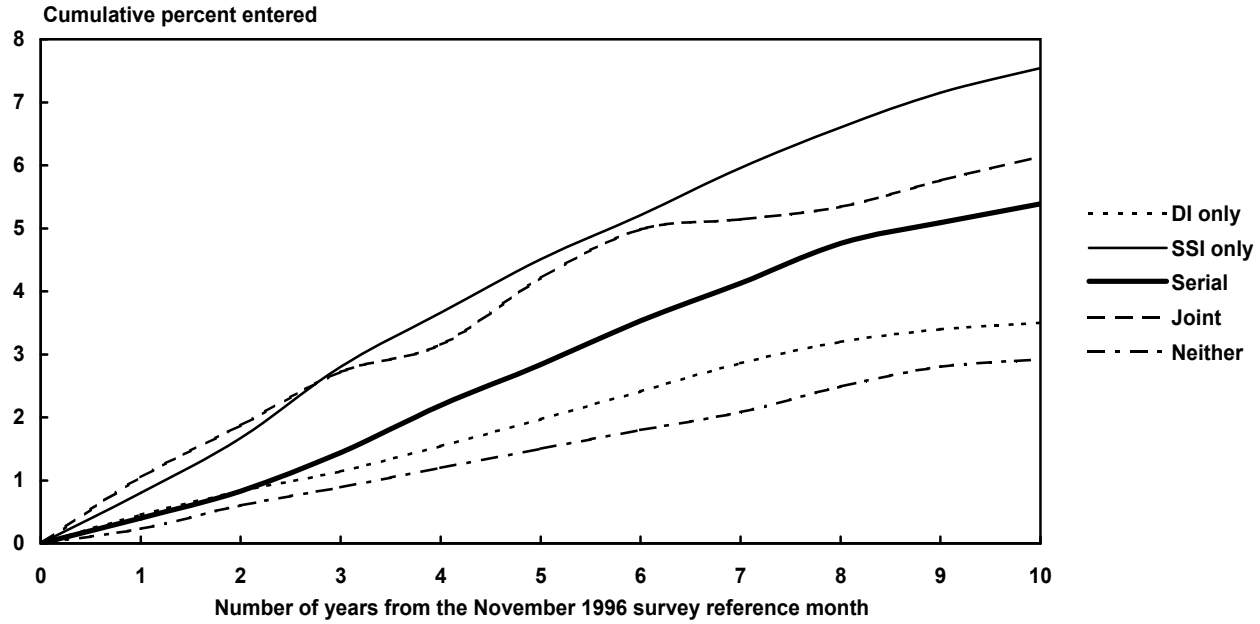
c. Unweighted number of sample observations.

are consistent with the results of Rupp and Davies (2004) that show that the disability safety net is enormously important from a life-cycle perspective for various vulnerable groups, such as the less educated. Overall, this preview of longitudinal patterns suggests the potential for future work using a life-cycle perspective.

Several specific areas of additional research are called for to enhance our understanding of the role of SSI in supplementing the DI safety net. Some important yet unexplored issues are as follows:

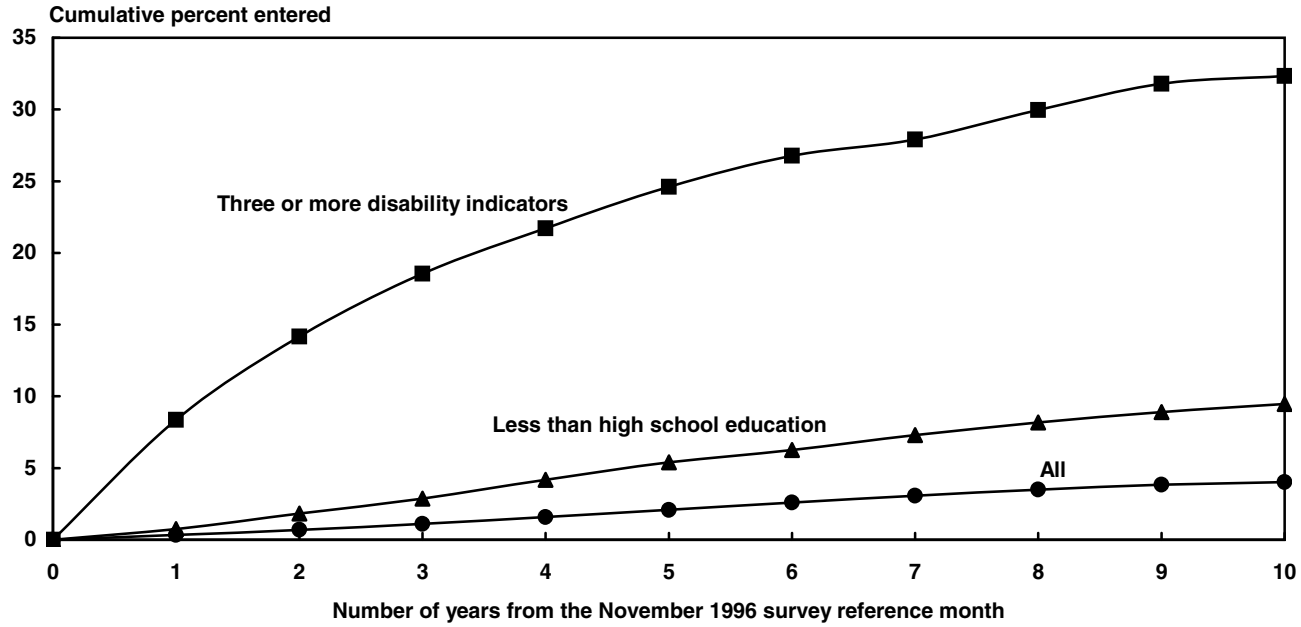
- *The effect of DI and SSI on income change associated with potential disability program entry.* This is clearly another important dimension of

Chart 5.
Cumulative disability program (SSI and/or DI) entry among nonparticipants aged 18–54 in November 1996, by DI-insured and SSI financial-eligibility status



SOURCE: Survey of Income and Program Participation matched to Social Security Administration administrative records, November 1996.
NOTE: SSI = Supplemental Security Income; DI = Disability Insurance.

Chart 6.
Cumulative disability program (SSI and/or DI) entry among nonparticipants aged 18–54 in November 1996, overall and for selected subgroups



SOURCE: Survey of Income and Program Participation matched to Social Security Administration administrative records, November 1996.
NOTE: SSI = Supplemental Security Income; DI = Disability Insurance.

the potential value of these safety net protections and should also help in understanding the financial incentives at work. The traditional concept of the DI wage replacement rate may be misleading because it ignores SSI/DI dynamic program interactions, is not applicable to people without labor force attachment, and ignores the broader family context. The broader, and more relevant, concept is net family income change attributable to qualifying disablement. Unlike the wage replacement rate, the net family income change concept can be applied both to persons with substantial labor force attachment and to others with little or no prior work experience. Finally, the wage replacement rate is not an indicator of distributional outcomes, yet net family income change is.

- *Long-term trends in disability coverage.* What changes can be expected in disability coverage in the future? What are the major factors underlying long-term trends in DI and SSI disability coverage? Relevant factors may include increased female labor force participation, changes in family structures, fertility, trends in real wages, and income distribution. Program design features, such as the wage indexing of initial DI benefits in contrast to the inflation-adjusted SSI income guarantee and the recent shift to wage indexing of the SGA threshold, may also affect future trends.[39]
- *Factors affecting disability program participation.* What are the differences in the rate of program participation among groups with varying patterns of SSI and DI coverage? Can such differences be attributable to differences in the demographic and disability/health status variables? Is there evidence to suggest that serial or concurrent coverage increases the propensity to participate? What are the implications of differences between the working-aged and the elderly for SSI simulation modeling?
- *The effect of DI and SSI coverage and potential benefit bundles on disability program entry that may result from a severe health/disability shock.* What are the longitudinal patterns of disability program entry? What are the effects of disability program entry on the financial well-being of subgroups with differential access to various programs, pension assets, and housing equity?
- *Longitudinal patterns of disability program participation and public health insurance coverage after first entitlement to benefits.* What proportion of new awardees has access to Medicaid before SSI or DI award? What is the role of Medicaid during the 24-month Medicare waiting period and beyond? What proportion of DI-only awardees eventually qualifies for SSI and Medicaid? What is the effect of the timing of disability applications and award decisions on the pattern of these safety net protections?

These and other topics can be addressed using a variety of data sources, such as the SIPP, the Health and Retirement Study, and linked Social Security, SSI, Medicare, and Medicaid records. Some issues can be fruitfully addressed using cross-sectional data, and others call for longitudinal designs.

Notes

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[1] In this chart, participation is restricted to participation in DI or in the SSI program as a disabled or blind working-age adult.

[2] DI-insured status does not require disablement. However, DI-insured status is necessary for a person to qualify for DI award. Once an applicant meets this test and is awarded benefits, we consider them to continue to have DI coverage.

[3] The FBR was $623 for a qualifying individual and $934 for a qualifying couple for calendar year 2007 and is subject to annual cost-of-living adjustments (COLAs). The corresponding values for 2008 are $637 and $956, respectively. In September 2007, the average SSI payment to recipients aged 18–64 was $482.40. In comparison, the average DI benefit to disabled workers in September 2007 was $979.70.

[4] The SGA is operationalized in terms of qualifying earnings at certain monthly levels. In 2007, for nonblind individuals, monthly earnings above $900 is treated as prima facie evidence of the applicant's ability to engage in SGA. The 2008 SGA is $940. The SGA determination is based on pretax earnings after deductions for impairment-related work expenses (if any) and considers some other factors as well. Since January 1, 2001, the SGA thresholds are subject to annual indexing to account for growth in average

wages. The 2007 SGA is about 1 percent above the monthly earnings of a full-time worker (assuming 2,080 hours of work per year) at the minimum hourly wage of $5.25 that has been in effect during recent years. In May 2007 the President signed a bill to increase the minimum wage in three steps. During the summer of 2007 the rate increases to $5.85 per hour: the 2007 annualized SGA amounts to only 89 percent of the annual wages of a full-time minimum wage earner at $5.85 per hour. (Authors' calculations based on http://www.dol.gov/esa/whd/, accessed on June 13, 2007.) The shift to a wage-indexed SGA in 2001 and the 2007 minimum wage legislation may affect the generalizability of the point estimates of disability benefit coverage we present later in the article, all based on 1996 data.

[5] There is a general income exclusion rule allowing for the disregard of up to $20 of income each month from any source.

[6] In fact SSI eligibility may lead to retroactive Medicaid eligibility for up to 3 months in some cases. States may establish Medicaid eligibility for the recipient as early as the first day of the third month preceding the month of application for SSI payments. (For more information, see SSA Program Operations Manual System (POMS) SI 01730.010).

[7] For further detail, see SSA POMS DI 25501.051 and SSA POMS SI 00601.009.

[8] For more information, see the *Annual Statistical Supplement to the Social Security Bulletin, 2006*, Tables 5.D3 and 7.A9.

[9] Also known as the Master File of Social Security Number Holders and Applications.

[10] The estimated standard errors of the proportions reported in this article were derived using the formula:

$$s.e. = \sqrt{[p*(1-p)/n]} * \sqrt{DEFF},$$

where s.e. = estimated standard error, p = estimated proportion, n = unweighted number of observations forming the base of the proportion, and DEFF = estimated design effect. Using information from the 1996 SIPP Source and Accuracy Statement (Census Bureau, 2001, Table 4, 22), we assume a constant DEFF = 2.34 to account for the complex SIPP sample design.

[11] In the current application of the FEM we ignore in-kind support and maintenance provisions that may affect financial eligibility.

[12] In our simulations we consider only the SSI federal cash benefit guarantee. Note that the SSI program also includes state supplementary benefits. Although state supplements are relevant to assess the expected total cash value of SSI benefits, they have a relatively limited effect on the determination of eligibility to receive SSI.

[13] Our measure is "conservative" because disability shocks may result in an earnings capacity reduced to zero or close to zero. Some may argue that the measure is not conservative in that people may have in-program earnings that are above SGA but do not lose benefit eligibility status as a result. However, the bulk of current beneficiaries have zero or below-SGA earnings, and only a small fraction has above-SGA earnings. More importantly, the key to the role of *own* earnings in estimating SSI coverage is this: For a person to transition from "nondisabled" to "disabled" status, it is necessary for earnings to be below or to drop below the SGA level. Before 2001, SGA had a "high" and "low" value. Persons with earnings below the "low" value are presumed to meet the SGA test. Those with earnings between the "high" and "low" values are subject to additional considerations, and persons with earnings above the "high" value are presumed not to be disabled. In 1996 the high and low SGA values were $500 and $300, respectively. We use the $500 value in our estimates, which results in somewhat more conservative estimates of the number of persons meeting the SSI financial eligibility test and the expected SSI benefits than the $300 value would render.

[14] If one allows for other changes over time, additional complexities arise. For example, some SSI-only awardees may gain DI-insured status because of work experience while in SSI benefit status. Likewise, DI-only awardees may become financially eligible for SSI as a result of asset spend down, changes in earned and unearned income, or marital status.

[15] We also ignore annual cost of living adjustments here to simplify the presentation.

[16] If the person has income amounting to $20 or more from other sources, our simplifying assumption that ignores the potential excludability of up to $20 of DI benefit makes no difference. In contrast, if the person has no income from other sources, the disposition as "serial" or "joint" beneficiary may be slightly different, and the combined monthly benefit after the 5-month waiting period will be up to $20 higher than the SSI-only benefit during the 5-month waiting period.

[17] Groups 2 and 3 combined are referred to as "concurrent eligibles."

[18] The second column of Table 1 presents the distribution using the unadjusted SSI financial eligibility measure (which is based on observed current income) to look at the sensitivity of the point estimates to the shift to our preferred eligibility measure (which accounts for the earnings loss that is a necessary condition of categorical eligibility) that is presented in the first column. Overall, the data show that the unadjusted measure substantially underestimates the proportion of the working-age population covered by SSI (20 percent versus the preferred estimate of 36 percent, and the difference is statistically significant). A salient detailed difference is the increase in the concurrent eligibles group and the corresponding decrease in the group that is only insured for DI as we move towards our preferred coverage estimate. Approximately one-fifth of those classified as DI-only under the unadjusted measure become concurrent eligibles under our preferred measure. Another important shift here is

from the "Neither" group to the SSI-only group for similar reasons. Almost one-fourth of those who appear ineligible for both programs under the unadjusted measure become SSI-only eligible under our preferred measure. All of the differences between the adjusted and unadjusted percentages of the four subgroups are statistically significant.

[19] This is comparable with the estimated 78 percent of the Social Security area population aged 20–64 that was DI-insured in 1995. (For more information, see Social Security Administration (2005), available at http://www.ssa.gov/policy/docs/chartbooks/fast_facts/2005/fast_facts05.html.) One reason for our estimate being somewhat lower is that we estimate the proportion for the population aged 18–64 representing a larger denominator without a tangible increase in the numerator. Adjusting for this difference in definition should increase the SIPP estimate to around 79 percent, which is slightly higher than SSA's estimate of 78 percent above, possibly because the SIPP sample frame excludes the institutional population.

[20] Authors' calculation: 23.5 / 36.1 = 65 percent.

[21] Author's calculation: 12.6 / (100-77) = 55 percent.

[22] We derived corresponding estimates for 1991 from the 1990 SIPP panel (wave 4, month 4 reference month). Overall the patterns were similar. We note that the proportion of DI-insured only (46 percent) and SSI-eligible only (10.8 percent) were relatively low in 1991. In contrast, a relatively high portion (30.3 percent) was classified as concurrent eligibles.

[23] Note that some of these people might transition to DI and/or SSI coverage at some point subsequent to the survey reference month.

[24] Rupp and Davies (2004) provide comparable information for both participants and nonparticipants.

[25] Mitchell and Phillips (2001) estimate probit models of DI-insured status and find that those who are in poor health are less likely to be DI-insured. Our findings here suggest that once SSI eligibility is explicitly accounted for, those who are not covered by either program are still more likely to be in poor health than DI-only and concurrent eligibles. Thus, while a big chunk of the seemingly uncovered population in the Mitchell-Phillips analysis is actually covered by SSI, their qualitative concern seems robust.

[26] Of course, the poverty rate can be recalculated using SGA-constrained *own* earnings and other assumptions about changes in family income such as changes attributable to disability program participation. This kind of exercise might be useful in some future study of net income replacement associated with disablement. However, in the current study we are focusing on the current characteristics of groups with different patterns of disability coverage. Therefore, the unadjusted poverty rate is the appropriate measure in this context.

[27] Actually, the DI-only group has an estimated proportion that is 2 percentage-points lower than for the other group. The difference is statistically significant, although the magnitude may not be meaningful.

[28] This may suggest some incentive for asset spend down. However, for those who are both income and asset ineligible this incentive is insufficient for gaining SSI eligibility. Also, many may simply spend down assets to substitute lost income associated with a disability shock or other factors, without engaging in strategic behavior. Both of these factors limit the potential scope of the moral hazard argument.

[29] The disability determination process is widely regarded as much longer and more cumbersome than the application process for many other programs, including TANF and Food Stamp.

[30] DI application may be delayed as a result of access to these alternatives; as discussed earlier this may result in forfeiting potential SSI payments. DI benefit eligibility would be affected only if the onset of a qualifying disability occurred 13 months or more before DI application.

[31] Although our primary interest here is coverage, other studies looking at the interaction among the various programs use different—and complementary—perspectives. The differences need to be considered in interpreting empirical results. For example, Burkhauser and Wittenburg (1996) look at simultaneous participation in several programs to gauge program interactions. Honeycutt (2004) also looks at participation, but uses a longitudinal design; his interest is in the antecedents of DI entry. Both of these perspectives are useful to describe realized (observed) participation patterns, but appear limited in terms of understanding the participation choices themselves. Information on coverage and other program parameters are relevant for describing the opportunity set of potential participants and the resulting decisions.

[32] Note that DI-insured status is conditioned on relatively stable prior employment experience. Conversely, SSI-only eligibility implies the lack of it. In addition, the SSI income test screens out people with substantial earnings.

[33] In some cases, people may lose such eligibility before actual disablement because of factors such as loss of TANF as a result of children passing age 18.

[34] In Chart 4 "Own health insurance" is the sum of "health insurance in own name, private" and "health insurance in own name, employer." The statistics may be a slight overestimate, because some people may have both. Note also that because some persons may have health insurance from several sources and others from none at all, the percentages in this chart do not necessarily add up to 100 percent.

[35] Both numbers reflect authors' calculation; data not shown.

[36] See Table 6.

[37] For our analytical sample, the full retirement age (FRA) and the SSI threshold of categorical eligibility as aged were identical—age 65. The two thresholds have been divorced more recently as a result of the gradual increase of

the FRA to 67. Another complicating factor is that people are eligible for early Social Security retirement benefits—with an actuarial reduction—at age 62. Thus the relevant life-cycle horizon definitely reaches age 62 for DI and age 65 for SSI, with the period between 62 years of age and the FRA characterized by the availability of both DI and Social Security early retirement benefits.

[38] Our interest is in disability program participation before reaching age 65. Persons aged 55 during the survey reference month would reach their 65th birthday by the end of the 10-year follow-up period, therefore we limited data in Charts 5 and 6 to persons aged 18–54 during the reference month.

[39] Under current law initial Social Security benefits are wage-indexed, but other indexing schemes have also been considered in recent discussions of Social Security reform options. The SGA threshold has been wage-indexed since January 2001; previously it was subject to ad hoc increases only. The SSI federal benefit rate is annually adjusted for changes in the consumer price index using the same formula that drives annual cost-of-living adjustments for Social Security benefits.

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Research on Immigrant Earnings

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Summary

As the first in a trio of pieces devoted to incorporating immigration into policy models, this review of research on immigrant earnings trajectories brings to light several findings. Controlling for demographic and human capital characteristics, immigrants often start their U.S. lives at substantially lower earnings, but experience faster earnings growth than natives with comparable years of education and experience. The extent to which the earnings trajectories of immigrants and natives differ varies by country of origin, with the source-country's level of economic development being a key determinant of the size of the U.S.-born/foreign-born difference. The earnings profiles of immigrants from economically developed countries such as Japan, Canada, or Western Europe resemble those of U.S. natives who are of the same age and education level. In contrast, the earnings of immigrants from developing nations tend to start well below those of U.S. natives with comparable education levels and experience, but rise more rapidly than their U.S. counterparts. Comparing the earnings profiles of immigrants of similar age, sex, and years of schooling, over time and across groups, a strong inverse relationship emerges between their initial earnings and their subsequent U.S. earnings growth. In other words, the lower (higher) the initial earnings are, the higher (lower) the earnings growth. These and other research results have important implications for the projection of immigrant earnings and emigration in microsimulation models, as discussed in the two articles following this one: (1) "Adding Immigrants to Microsimulation Models" and (2) "Incorporating Immigrant Flows into Microsimulation Models."

Introduction

Immigration policy in the United States and the source-country composition of U.S. immigration have changed radically over time. Ending a period of high immigration, the Emergency Quota Act of 1921 and the Immigration Act of 1924 created a system that allocated visas according to the national-origin composition of the late 19th and early 20th century U.S. population, favoring immigration from Western European countries and greatly reducing or eliminating immigration from Asia and Southern and Eastern Europe.[1] With the end of World War II, various changes chipped away at the national origin system and, in 1965, an Immigration and Nationality Act made family reunification, as opposed to national origin, the primary determinant of entry. To a much lesser extent, the new system also made room for persons to enter via employer requests for needed occupational skills.[2] Given differences in the relative economic opportunities between the United States and the countries whose immigration had been

Table 1.
National origin composition of legal immigrant flow: Percent of immigrants in each time period originating in selected countries

Period	Asia	Europe	Canada	Latin America	Other	Total
1941–1950	3.6	60.0	16.6	17.7	2.1	100
1951–1960	6.1	52.7	15.0	24.6	1.6	100
1961–1970	12.9	33.8	12.4	39.2	1.7	100
1971–1980	35.3	17.8	3.8	40.3	2.8	100
1981–1989	41.6	11.0	2.3	41.9	3.2	100

SOURCE: U.S. Immigration and Naturalization Service, *Statistical Yearbook of the Immigration and Naturalization Service*, 1990.

severely restricted before 1965, the source-country composition of U.S. immigration shifted. Most recent immigrants come from Asian and Latin American countries in marked contrast to the earlier European-dominated immigration (Table 1).

A perusal of immigration research over the 20th century reveals, not surprisingly, that the extent to which social scientists have studied U.S. immigration follows the ebbs and flows of U.S. immigration. With the restrictive immigration policy of the 1920s and subsequent decline in the number of immigrants entering the United States, immigration lost its luster as an interesting research topic. With the reopening of the U.S. admission gates in the 1960s and subsequent growth in the number of immigrants entering the United States, immigration reemerged as a hot topic. Whenever immigration has been studied, a key focal point for scholars and policy analysts has been, how do immigrants fare in the U.S. labor market? Though on the surface, a simple question, answering it has meant scaling a methodological hurdle: how to discern from the available data the earnings growth of immigrants as they live in the United States.

The first studies measured immigrant earnings growth with a single year of decennial census data, by comparing the earnings of immigrants who had recently arrived with the earnings of immigrants who had been in the U.S. multiple years. Later studies used two censuses: Using more than one census provides information on the earnings growth of the year-of-entry immigrant cohorts that are identified in both censuses. Following this, three censuses were used, permitting an analysis of how changes in the initial earnings of immigrant cohorts are related to changes in their subsequent earnings growth. Most recently, analysts have used longitudinal data to trace the earnings trajectories of the same individuals. The estimates of immigrant earnings growth from these various efforts reflect an interesting historical interplay between how researchers have perceived changes in immigration over time, the methods they have used to measure immigrant earnings growth, and the assumptions behind those methods.

The review of immigrant earnings research that follows reveals key differences between the earnings of the foreign born and U.S. natives, differences *among* immigrant groups, and changes in these patterns over time. These findings help refine and develop appropriate methods for forecasting immigrant earnings and emigration in policy models—the subject of this article's companion pieces also featured in this issue, "Adding Immigrants to Microsimulation Models" (Duleep and Dowhan 2008a) and "Incorporating Immigrant Flows into Microsimulation Models" (Duleep and Dowhan 2008b).

A Decline in Immigrant Entry Earnings

Following immigration's peak in the early 20th century,[3] a model of immigrant assimilation was spawned in the University of Chicago's sociology department. Most closely associated with the works of Robert E. Park, this model portrayed immigrants' trajectories in the host society and economy as a single process that applied to all immigrants, eventually leading to their cultural and economic assimilation in U.S. society and economy.[4]

The theme of immigrant assimilation reemerged following the resurgence of U.S. immigration in the 1960s. Echoing Park's thesis but focusing on labor market outcomes, Chiswick (1978, 1979) theorized that migrants often lack skills specific to their destination country that would permit their home-country human capital to be fully valued in the host-country labor market. In other words, immigrants initially earn less than similarly qualified U.S. natives because the specific skills and knowledge associated with their

years of schooling and experience are not valued as much by U.S. employers as are the skills of individuals who were raised and educated in the United States. Assimilation in this context is acquiring specific skills that enable an immigrant to earn on a par with a U.S. native of comparable experience and education.

Immigrants engage in many forms of human capital investment to increase the U.S. labor market value of their home-country human capital. Human capital investment activities include learning English, pursuing various forms of informal and formal U.S. schooling and training, and becoming knowledgeable about U.S.-specific institutions, production methods, and technical terms. The specific "skills" needed to increase the U.S. labor market value of home-country human capital may also include credentials, such as a diploma or training certificate that is recognized by U.S. employers or is needed to perform a particular kind of work in the United States. As English and other U.S.-specific skills or credentials are gained, the value of the immigrant's home-country human capital approaches that of a comparably educated and experienced U.S. native.

Chiswick found empirical support for the assimilation model using a single cross-section of data, such as one year of decennial census data; Chiswick's seminal research was based on 1970 census data.

The census and other surveys that ask when immigrants came to the United States to stay make it possible to identify various "year-of-entry" immigrant cohorts.[5] For instance, with the 1970 census it is possible to identify immigrants who came to the United States in the years 1965–1970,[6] 1960–1964, 1955–1959, 1950–1954, and before 1950. The 1969 earnings (reported on the 1970 census) of immigrants who entered the United States in the 1965–1970 period can be used as an estimate of the initial earnings of immigrants. The 1969 earnings of immigrants who entered the country in the 1955–1960 period provide an estimate of the earnings that immigrants achieve after living 10–15 years in the United States. The difference in earnings between the recent entrants and the longer-term residents provides a "cross-sectional" estimate of immigrant earnings growth.

With the cross-sectional approach, immigrant earnings growth is generally estimated in an earnings regression, using the cross-sectional variation to statistically measure the relationship between "years since migration" and immigrant earnings, controlling for other variables such as age and years of schooling. A fundamental assumption underlying this approach is that the initial earnings and earnings growth of entering immigrants will mimic the earnings paths of earlier immigrants, controlling for observable characteristics such as education, age, and sex. Studies that have used the cross-sectional methodology estimate high-earnings growth for immigrants, substantially exceeding that of U.S. natives; with time in the United States, the earnings of immigrants approach those of their U.S.-born statistical twins.

In the mid-1980s, the immigrant assimilation picture proffered by Park and Chiswick was shattered. A series of articles by Borjas (1985, 1987, 1992a, 1992b) showed that recent immigrants were starting their U.S. economic lives at much lower earnings than their predecessors. Tracing the earnings of earlier immigrant cohorts across two censuses revealed only modest earnings growth, substantially lower than the cross-sectional prediction of immigrant earnings growth. This is because much of the cross-sectionally measured earnings growth stemmed from linking the lower entry earnings of more recent cohorts with the higher earnings of earlier cohorts, whose initial earnings exceeded those of their successors.

Indeed, a decline in immigrant entry earnings has occurred (Table 2). Male immigrants aged 25–54 in the 1965–1970, 1975–1980, and 1985–1990 entry cohorts earned a declining proportion of the median earnings of native men aged 25–54: In 1969, immigrant men who entered the United States in 1965–1970 earned 65 percent of native men's earnings; in 1989, male immigrants who entered the United States in 1985–1990 earned only 41 percent of their U.S. male counterparts.[7] The lower immigrant entry earnings of the 1975–1980 and 1985–1990 entry cohorts relative to the 1965–1970 cohort persist *within age and education categories* (Table 2)[8] thus invalidating one of the key assumptions of the cross-sectional approach—constancy in entry earnings across year-of-entry cohorts, once demographic and human capital characteristics are controlled for.

Borjas' research, which highlighted year-of-entry cohort effects, launched a fresh fleet of empirical studies armed with a new methodology for measuring immigrant earnings growth. In this methodology, analysts pool two or more cross sections, such as two decennial census samples, to estimate the earnings path of immigrants. Pooling data from two cross sections, such as two censuses, provides information on earnings at two points in time for each year-of-entry cohort that is identified in both censuses. For instance, using the 1970 and 1980 censuses it is possible to

Table 2.
Median entry earnings of immigrant men relative to the U.S. born, over time, by age and education level

Age group and education level	Ratio of 1969 earnings of the 1965–1970 immigrant cohort to U.S. natives (measured with 1970 census data)	Ratio of 1979 earnings of the 1975–1980 immigrant cohort to U.S. natives (measured with 1980 census data)	Ratio of 1989 earnings of the 1985–1990 immigrant cohort to U.S. natives (measured with 1990 census data)
Ages 25–54			
All education levels	0.653	0.500	0.406
Ages 25–39			
1–12 years of schooling	0.631	0.486	0.529
More than 12 years of schooling	0.577	0.463	0.485
Ages 40–54			
1–12 years of schooling	0.594	0.417	0.381
More than 12 years of schooling	0.522	0.479	0.500

SOURCES: Estimates are based on the 1970 Census of Population 1 percent public-use sample, the 1980 Census of Population 5 percent "A" public-use sample, and a 6 percent microdata sample created by combining and reweighting the 1990 Census of Population 5 percent and 1 percent public-use samples.

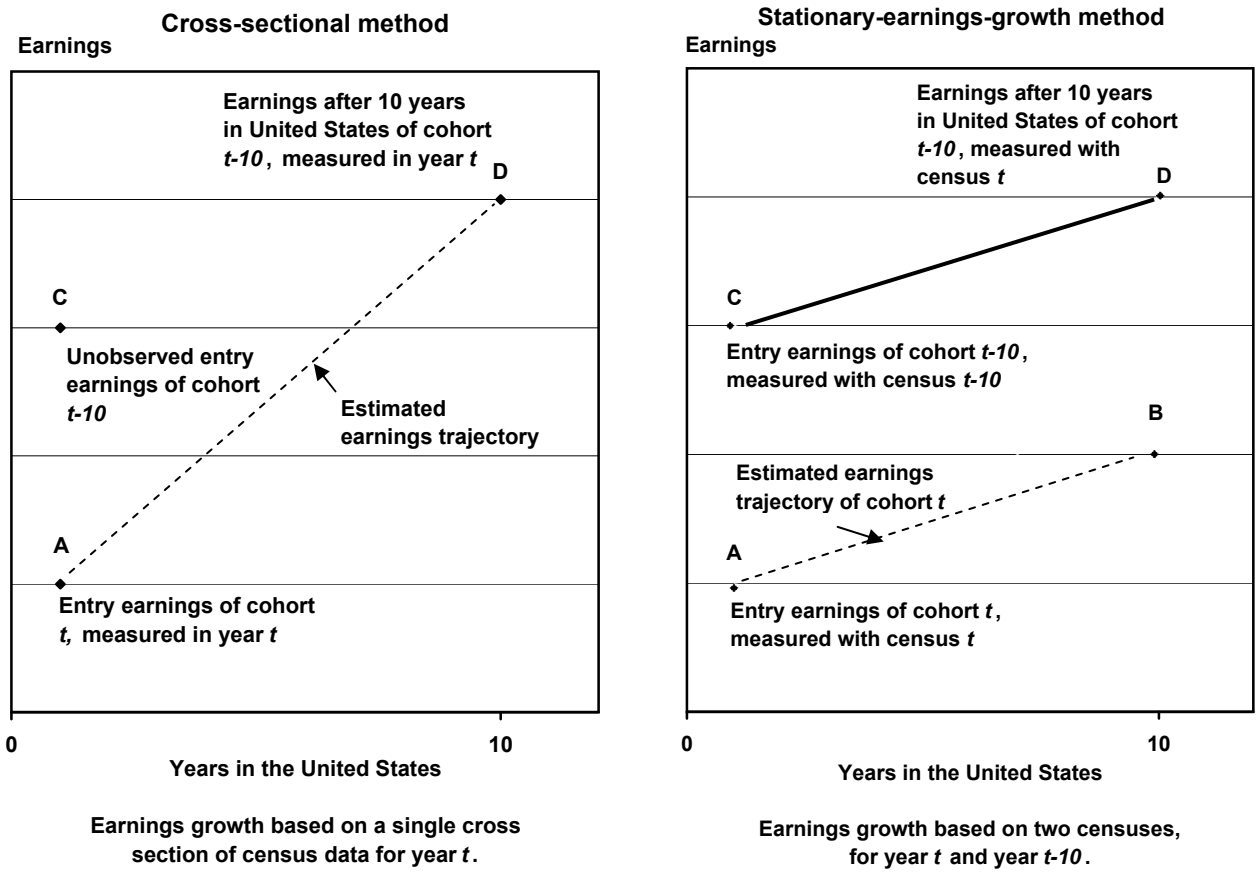
NOTES: Immigrant cohorts are defined by the year they reported to the Census Bureau as the year they came to the United States to stay, which may be after the initial year of U.S. entry. For a discussion of this issue and the effect of various year-of-entry definitions on measuring immigrant earnings growth, see Duleep and Dowhan (2002). Because no labor force status restrictions are placed on the census cohorts, median earnings are computed on samples that include zeros. For a discussion of how limiting the sample to employed persons can affect measures of immigrant economic assimilation in studies that follow immigrant entry cohorts across two or more censuses, refer to Duleep and Regets (2002).

follow over 10 years the earnings of immigrants who immigrated in 1965–1970, 1960–1964, 1955–1959, 1950–1954, and before 1950, since these are the year-of-entry cohorts identified in both censuses. As in the cross-sectional approach, immigrant earnings growth is estimated in an earnings regression by statistically measuring the relationship between years since migration and immigrant earnings, controlling for age and education level. However, the information that informs the estimation of the relationship between earnings and years since migration comes not from a single cross section, but from the 10-year earnings growth of the year-of-entry cohorts that are identified in both censuses. Furthermore, categorical (zero-one) variables are included for each year of entry to capture earnings differences across the year-of-entry cohorts. The addition of the categorical variables (inspired by the fact that recent immigrant cohorts are starting at much lower earnings than earlier cohorts) permits the entry earnings of the immigrant cohorts to change, thus permitting the estimated relationship between years since migration and earnings to begin at different earnings levels.

This methodology, pioneered by Borjas and first estimated with data from two decennial censuses, is now used by many other analysts with other sources of data, including longitudinal data on individuals. It could be called the "stationary earnings growth" approach for estimating immigrant earnings growth because it assumes that the earnings growth rate of year-of-entry immigrant cohorts is constant once observable variables, such as age and education, are accounted for. Assuming the earnings growth rate of earlier cohorts accurately predicts the growth rate of more recent cohorts yields a bleak prognosis of the ability of recent immigrants to assimilate because their initial earnings disadvantage persists unabated.

Chart 1 illustrates some key concepts. The left-hand side presents the cross-sectional methodology for estimating immigrant earnings growth. It shows the earnings that we would observe in a single cross section from census year *t*. We see the entry earnings of the most recent cohort (point A) and the earnings that the earlier cohort (cohort *t*-10) achieves after 10 years in the United States (point D). Unobserved, at time *t*, are the earnings that the earlier cohort of immigrants first received when they came to the United States 10 years ago (point C). By pairing the initial earnings of the recent cohort (cohort *t*) with the earnings at the 10-year point of the earlier cohort (cohort *t*-10), the cross-sectional method overestimates the earnings growth of the earlier cohort. The line A-D will accurately represent the earnings trajectory of the more recent cohort only if the earnings growth of this cohort

Chart 1.
Estimates of immigrant earnings growth based on two methods



SOURCE: Authors' illustration.

substantially exceeds that of the earlier cohort. Indeed, earnings growth would have to increase so that the recent cohort's earnings catch up to the earlier cohort in 10 years' time.

The right-hand side of Chart 1 illustrates the stationary-earnings-growth methodology for estimating immigrant earnings growth. It shows the earnings that we would observe by pooling data from two decennial censuses, one from census year *t*, the other from census year *t*-10. With the addition of the earlier data, we now observe the initial earnings of cohort *t*-10 (point C). The line C-D is the actual earnings trajectory of this earlier cohort. The line A-B is the projected earnings trajectory of the more recent cohort (cohort *t*). It will accurately predict the more recent cohort's earnings if and only if there has been no intercohort change in immigrant earnings growth.

Borjas correctly showed that in a situation where immigrant initial earnings are falling over time, the cross-sectional methodology (pairing the initial earnings of more recent immigrants with the earnings achieved by *earlier* immigrants after 10–15 years in the country) overstates the earnings growth of the earlier immigrants. However, we cannot deduce from Borjas' finding that the earnings growth of earlier cohorts predicts the earnings growth of more recent cohorts, as is assumed in the stationary-earnings-growth methodology.

Theories about the Decline in Immigrant Entry Earnings

Whether a decline in the initial earnings of immigrants is accompanied by an increase, decrease, or no change in immigrant earnings growth depends on the reason for the decline. Two hypotheses, with opposing predictions about the relationship between immigrant entry earnings and earnings growth, have been put forth to explain why the age- and education-adjusted entry earnings of U.S. immigrants declined. One hypothesis (the income distribution–immigrant ability hypothesis) proposes that the decline reflects a decrease in the

(labor market) quality of U.S. immigrants. The other hypothesis (the economic development-skills transferability hypothesis) proposes that the decline reflects a decrease in immigrant skill transferability.

The Income Distribution–Immigrant Ability Hypothesis

Borjas theorized that the cause of the decline in immigrants' initial earnings was a decline in the labor market quality of immigrants fueled by an increase in the income inequality of the countries contributing to U.S. immigration (Borjas 1987, 1990, 1992a, 1992b). According to this theory, immigrants coming from countries with greater income inequality than the United States will be selected from the lower tail of the ability distribution in the country of origin, whereas immigrants coming from countries with less income inequality than the United States will be selected from the upper tail of their countries' ability distributions.[9]

Borjas (1987, 537) noted that before the 1965 Immigration and Nationality Act, immigration from Western Europe was dominant in the United States. The national origins quota system, based on the late 19th and 20th centuries' U.S.-ethnic composition, "encouraged immigration from (some) Western European countries and discouraged immigration from all other countries." Measuring income inequality by the ratio of income accruing to the top 10 percent of households to that accruing to the bottom 20 percent, Borjas (1992a, 44) showed that the amount of dispersion in the average immigrant's source country doubled in the postwar period, with most of that increase occurring after 1960.[10] He observed that with the decline of the national origins system,

> The new flow of migrants originates in countries that are much more likely to have greater income inequality than the United States. It would not be surprising, therefore, if the [labor market] quality of immigrants declined as a result of the 1965 Amendments. (Borjas 1987, 537)

Although it is theoretically ambiguous whether lower labor market ability leads to initially lower earnings,[11] under any human capital model a decline in immigrant labor market ability would not be associated with an increase in earnings growth. According to the income distribution–immigrant ability explanation for the decline in immigrant entry earnings, immigrant earnings growth should have declined or stayed constant as immigrant entry earnings declined. The method pioneered by Borjas for measuring immigrant earnings growth assumes that immigrant earnings growth remains constant as immigrant entry earnings decline.

The Economic Development-Skills Transferability Hypothesis

An alternative hypothesis for the decline in the education- and age-adjusted entry earnings of immigrants is that it reflects a decline in the extent to which the country-of-origin skills of immigrants transfer to the United States (Duleep and Regets 1997b).

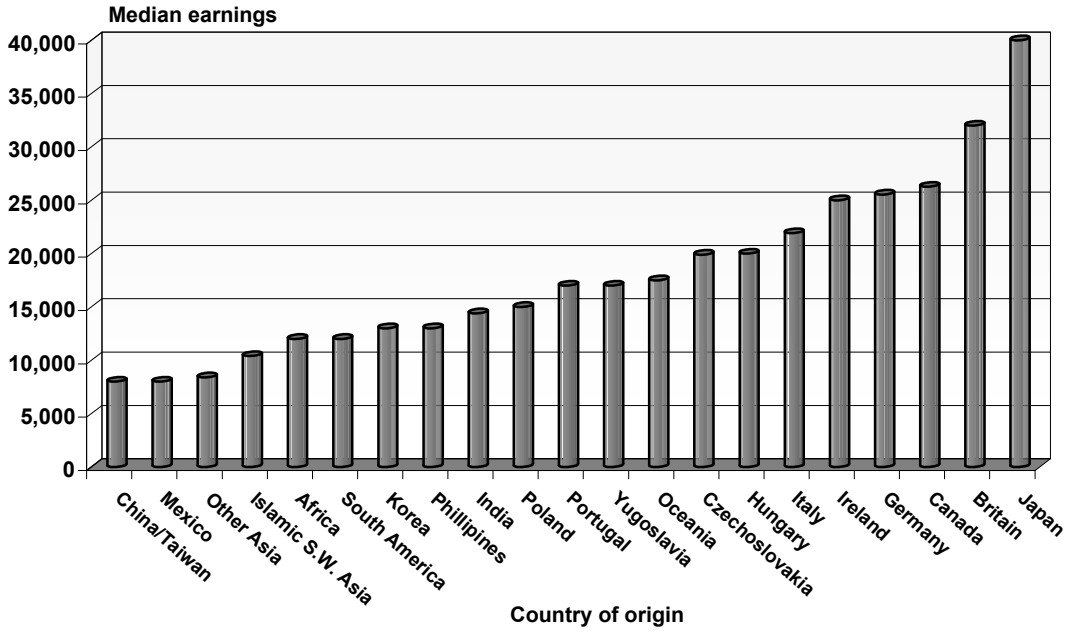
The initial earnings of U.S. immigrants vary enormously depending on where they come from (Chart 2).[12] Immigrants from the source regions that dominate recent U.S. immigration (Asia and Central and South America) initially earn about half or less than half of what U.S. natives earn, whereas the entry earnings of Western European immigrants resemble those of the U.S. born. Moreover, these differences persist within age and education categories (Table 3).[13]

A key factor underlying the variation in immigrants' initial U.S. earnings appears to be the source country's level of economic development. Immigrants from regions of the world with levels of economic development similar to the U.S., such as Western Europe and Japan, have initial earnings approaching or exceeding those of comparably educated and experienced U.S. natives. Those hailing from economically developing countries have low initial earnings relative to their U.S.-born counterparts. When the median 1989 U.S. earnings of immigrant men who entered the United States in the 1985–1990 period is plotted against the 1987 per adult gross domestic product (GDP) of each source country,[14] a positive relationship between immigrant entry earnings and level of economic development emerges (Chart 3).[15]

Though Borjas focused on an increase in the inequality of U.S. immigrant source countries, post-1965 immigrants are also more likely to come from countries that are less economically developed relative to the United States than was true of earlier cohorts (Reimers 1996).[16] This decrease in the economic development of the countries contributing to U.S. immigration could have contributed to a decline in immigrant skill transferability. That is, it could have contributed to a decline in the extent to which immigrant home-country education and experience is valued in the U.S. labor market.

Two conceptualizations link immigrant skill transferability to the level of economic development of immigrants' countries of origin. One suggests that

Chart 2.
Median 1989 U.S. earnings of men aged 25–54 who immigrated in the years 1985–1990, by country of origin



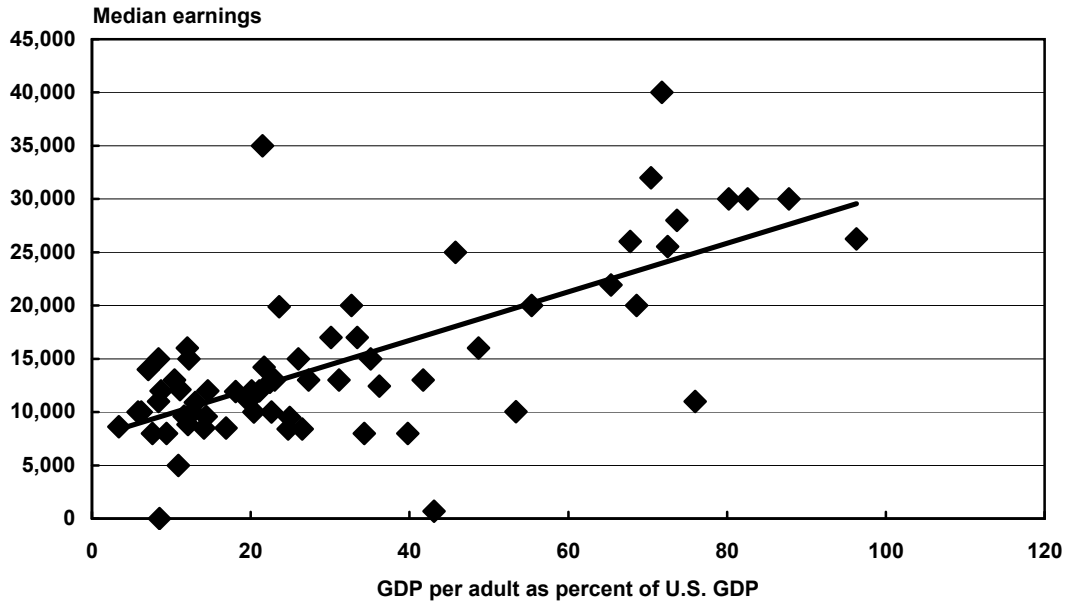
SOURCE: Estimates are based on the 1990 Census of Population 5 percent and 1 percent public-use samples.

Table 3.
Median entry earnings in 1989 of immigrant men aged 25–54 who entered the United States from 1985 through 1990 relative to the U.S. born, by immigrant region of origin: Ratio of 1989 earnings of the 1985–1990 immigrant cohort to U.S. natives

Region of origin	All	Aged 25–39		Aged 40–54	
		12 years of schooling	More than 12 years of schooling	12 years of schooling	More than 12 years of schooling
All immigrants	0.406	0.529	0.485	0.381	0.500
Asia	0.443	0.589	0.434	0.316	0.439
Central/South America	0.364	0.506	0.447	0.376	0.401
Western Europe	1.010	1.147	0.931	0.845	1.372

SOURCE: Estimates are based on a 6 percent microdata sample created by combining and reweighting the 1990 Census of Population 5 percent and 1 percent public-use samples.

Chart 3.
The relationship between gross domestic product (GDP) per adult and U.S. median initial earnings of immigrant men



SOURCE: Earnings estimates are based on 1990 Census of Population 5 percent and 1 percent public-use samples. The statistics on GDP per adult as a percent of U.S. GDP per adult are from Heston and Summers (1991).

source-country variations in immigrants' initial earnings stem from variations in the skills learned by growing up and working in different source countries (Chiswick 1978, 1979; Mincer and Ofek 1982). Holding constant the level of human capital (years of schooling and work experience), the skills of immigrants hailing from economically developed countries transfer more easily to the U.S. because these countries and the U.S. share similar educational systems, industrial structures, and labor market reward structures; the skills of immigrants from economically less-developed countries are less transferable to the United States (initially resulting in lower U.S. earnings) because the formal education and work experience in these countries are less applicable to the U.S. labor market.

The other conceptualization links immigrant skill transferability to the level of economic development of immigrants' home countries via an opportunity selection mechanism (Duleep and Regets 1997b). According to this conceptualization, immigrants from less-developed countries have lower skill transferability because the limited opportunities in less-developed countries make it worthwhile for them to migrate even when immigration entails substantial post-migration investments in new skills and credentials such as learning English, undertaking a U.S. degree program, or starting a business; their equivalents in economically developed countries would only migrate if there were positions for them in the United States that immediately valued their source-country skills and they did not have to invest in new human capital, whether it be learning English or undertaking additional training.

The opportunity selection explanation for variations in the skill transferability of immigrants accommodates otherwise inexplicable intergroup patterns of English proficiency and entry earnings. Reflecting India's British colonial history, the English proficiency of Asian Indian immigrants far surpasses that of non-British European immigrants (Table 4). Yet the initial earnings of Asian Indians in the United States are low relative to those of European immigrants, particularly when intergroup variations in educational achievement are held constant (second data row, Table 4). Filipino immigrants are more proficient in English than their non-British European counterparts, yet have lower initial earnings. Conversely, the initial earnings of Japanese immigrant men are very high, despite their very low English proficiency.[17] The entry earnings of Korean, Asian Indian, Filipino, and Chinese immigrants are similar despite enormous variation in their English proficiency (Table 4). Of those entering the United States from 1975 to 1980, only 24 percent of

Table 4.
Entry earnings of immigrant men relative to the U.S. born and immigrant English proficiency

	Filipino	Chinese	Korean	Asian Indian	Japanese	West European, excluding British	British
The ratio of foreign-born to native-born 1979 median earnings [a]	0.57	0.36	0.56	0.68	1.09	0.77	1.23
The ratio of foreign-born to native-born earnings holding years of schooling and demographic variables constant [b]	0.59	0.43	0.54	0.49	1.01	1.07	1.23
Percent of 1975–1980 entry cohort that:							
Speaks English poorly or not at all	9.4	42.2	45.9	6.1	26.8	30.7	0.3
Speaks only English or speaks English very well	50.9	19.0	15.0	68.0	25.3	41.4	99.2

SOURCE: Estimates are based on the 1980 Census of Population 5 percent "A" public-use sample.

a. Men, ages 25–64. The foreign born are those who reported to the census entering the United States from 1975 through 1980.

b. To compare the earnings of the various immigrant groups, group-specific regressions were estimated in which the natural logarithm of earnings was regressed on the following explanatory variables: level of schooling (a three-part spline), age, age squared, age x education, years since migration, education x years since migration, marital status, metropolitan status, and regions of residence. Using the estimated coefficients from the group-specific earnings regressions, we simulated the earnings profiles of each immigrant group. To provide a benchmark by which the earnings of each immigrant group could be compared, we also simulated the earnings growth of American-born, non-Hispanic white men. Each simulation begins at age 28, which for immigrants we also held constant as the age at migration. The estimates in the table show the ratio immigrant to native earnings evaluated at one year after migration. In these estimations, years of schooling, marital status, metropolitan status, and region of residence are held constant at the mean values of the U.S.-born white men. These group-specific analyses are from Duleep and Regets (1992b).

the Chinese and 15 percent of the Koreans reported speaking English very well compared with 69 percent of Asian Indian men and 51 percent of Filipino men. The similarity in their entry earnings is not surprising, however, if intergroup differences in skill transferability stem from variations in immigrant selection based on intercountry differences in economic opportunity: The common link among these countries is a low level of economic opportunity relative to the United States.

It is not necessarily the language of the sending country that determines immigrants' initial earnings in the United States, or even the language proficiency of those who migrate. Rather, persons who migrate from economically developed countries will tend to be persons with U.S. positions not requiring additional human capital investment. The opportunity selection argument also accommodates findings that the quality of education in some less economically developed countries is not inferior to that in the United States, and may be superior (Rivera-Batiz 1996). Rather than the skills learned in less-developed countries being less applicable to the United States, economic conditions in those countries make it worthwhile for persons to immigrate even when they lack skills that immediately transfer to the U.S. labor market.

Immigrant Skill Transferability and the Propensity to Invest in Human Capital

Regardless of what is behind a decline in immigrant skill transferability, a decline in the initial earnings of immigrants caused by a decline in immigrant skill transferability should be accompanied by an increase in earnings growth. This prediction flows from two basic concepts of a simple Immigrant Human Capital Investment (IHCI) model (Duleep and Regets 2002,

1999). First, immigrants whose home-country skills transfer poorly to the U.S. labor market will, by virtue of their lower wages, have a lower opportunity cost of human capital investment than natives or immigrants with high skill transferability. That is, the time they spend learning new skills, instead of applying their current skills to earning, is less costly than it is for high skill transferability immigrants or natives who earn more with the same level of education and experience. Second, the source-country human capital that is not valued in the U.S. labor market is still useful for learning new skills. There are several reasons for this (Duleep and Regets 2002):

- Part of the difficulty in transferring human capital between the labor markets of countries is a matter of information costs and risks. It can be much harder for potential employers to evaluate foreign educational credentials and work experience. However, even if employers have difficulty evaluating immigrant human capital, those skills are still useful in gaining new skills.[18]
- Learning skills—the set of abilities and experiences that aid in gaining new knowledge and skills—should transfer more readily than skills more specifically related to the business and production practices in the origin and destination countries. Those with home-country skills have learned how to learn; previously learned work and study habits may greatly facilitate the learning of destination-country skills.
- Similarity and common elements between old and new skills aid learning. Although the technologies in producing goods and services differ across countries—particularly between developed and less-developed countries—the processes, materials, and ultimate aims are analogous. Thus, skills acquired in a less-developed source country are useful for learning skills in a more-developed destination country: A Cambodian carpenter's experience with a hand saw is useful in learning to use an electric saw. More generally, persons who have learned one set of skills—even if those skills are not valued in the destination-country labor market—have advantages in learning a new set of skills. Cognitive psychologists refer to this phenomenon as "transfer".

The lower opportunity cost of human capital investment for immigrants lacking skills that immediately transfer to the U.S. labor market combined with the usefulness of the undervalued human capital for creating new human capital creates a greater incentive for low-skill-transferability immigrants to invest in human capital than would be true of either high-skill-transferability immigrants or natives with similar levels of education and experience (Duleep and Regets 1999, 1994a, 2002). Because greater human capital investment fuels greater earnings growth, the IHCI model predicts that immigrants will experience higher earnings growth than natives, and among immigrants, there will be an inverse relationship between entry earnings and earnings growth.[19] Immigrants whose skills initially transfer poorly to the United States will have lower initial earnings but higher earnings growth than natives or immigrants with similar levels of education and experience, but with highly transferable skills.

An implication of the IHIC model is that a decline in immigrant entry earnings caused by a decline in immigrant skill transferability will be accompanied by an increase in earnings growth. This prediction holds regardless of whether skill-transferability variations arise from variations in the skills learned in immigrants' countries of origin (as proposed by Chiswick) or from an opportunity-driven selection of immigrants (as proposed by Duleep and Regets), or both. However, an implication of the opportunity-selection theory is that immigrants will be more likely than natives to invest in human capital in general, not just human capital that restores their original human capital.

Empirical Evidence on the Relationship Between Immigrant Entry Earnings and Earnings Growth

Several different approaches have been used to measure the relationship between immigrant entry earnings and earnings growth.

Using Census Data to Measure the Relationship

Without imposing any restrictions on either entry earnings or earnings growth, Duleep and Regets (1994a, 1994b, 1997b, 2002) followed country-of-origin/age/education cohorts of immigrants across the 1960 through 1980 and 1970 through 1990 decennial censuses.[20] For instance, using the 1980 census, they measured the 1979 earnings of immigrants, ages 25–54, who entered the United States in the 1975–1980 period.[21] Using the 1990 census, they measured the 1989 earnings of the same cohort of immigrants—those who entered the United States in the 1975–1980 period and were ages 35–64 in 1990. Similarly, using the 1970 and 1980 censuses, they measured the entry earnings and earnings after 10 to 14 years of U.S.

residence of immigrants who entered the country in the 1965–1970 period. They also measured the earnings of comparably aged U.S. natives to provide estimates of relative immigrant earnings growth.[22]

Duleep and Reget's analyses show that as immigrants' entry earnings decreased over time, their earnings growth increased. Despite a 23.4 percent drop in the initial earnings relative to the native born between the 1965–1970 and the 1975–1980 immigrant entry cohorts, there is very little difference in the relative earnings of each cohort after 10 to 14 years of U.S. residence—85.4 percent for the 1965–1970 cohort and 83.9 percent for the 1975–1980 cohort (Table 5). This is because the more recent cohort, with lower relative entry earnings, had a much higher earnings growth rate. The effect is even more dramatic when separating into age and education groups. In each case, the cohort with lower relative entry earnings surpassed the initially higher-earning immigrant cohort in relative earnings.[23] This suggests an inverse relationship between immigrant entry earnings and earnings growth.[24]

Duleep and Regets also examined the relationship between immigrant entry earnings and earnings growth across groups, again finding that within age/education groups, the lower the entry earnings, the higher the earnings growth. Dividing countries of origin according to level of economic development, they found that immigrants coming from less economically developed regions of the world have lower entry earnings but higher earnings growth than immigrants of similar age and education coming from economically developed countries. Finally, Duleep and Regets find a strong inverse relationship between the entry earnings of immigrants and their earnings growth over time for the same country.[25]

Evidence from Longitudinal Data

Analyses, such as those of Duleep and Regets, which follow year-of-entry immigrant cohorts across decennial censuses could reflect immigrant emigration and changes in census coverage over time. To circumvent problems with changing cohort composition, Duleep and Dowhan (2002) used longitudinal Social Security Administration (SSA) earnings data matched to the 1994 March Current Population Survey (CPS) to follow the annual earnings of the same working-age foreign- and native-born men, from multiple year-of-immigration cohorts, over time.[26] Using the longitudinal data on individuals, Duleep and Dowhan (2000) also measured the earnings trajectories of immigrant women.

The left-hand side of Table 6 shows the foreign- to native-born earnings ratios at the first year following the CPS-defined year of immigration, and 10 years later. The results adjusting for differences in age and education between the foreign and native born are to the right of the unadjusted results. These results show that the initial earnings of immigrant men have generally fallen over time in relation to native-born men, a decline that persists when evaluating native-born earnings at each foreign-born cohort's age and education distribution. Foreign-born men who immigrated

Table 5.
Median earnings of immigrant men relative to natives during the first 5 years in the United States and 10 years later: 1965–1970 and 1975–1980 immigrant entry cohorts

	1965–1970 cohort		1975–1980 cohort	
Age group and education level	1969 ratio to natives (measured with 1970 census data)	1979 ratio to natives (measured with 1980 census data)	1979 ratio to natives (measured with 1980 census data)	1989 ratio to natives (measured with 1990 census data)
Ages 25–54				
All education levels	0.653	0.854	0.500	0.839
Ages 25–39				
1–12 years of schooling	0.631	0.706	0.486	0.750
More than 12 years of schooling	0.577	0.864	0.463	0.886
Ages 40–54				
1–12 years of schooling	0.594	0.769	0.417	0.867
More than 12 years of schooling	0.522	0.720	0.479	0.788

SOURCES: Estimates are based on the 1970 Census of Population 1 percent public-use sample, the 1980 Census of Population 5 percent "A" public-use sample, and a 6 percent microdata sample created by combining and reweighting the 1990 Census of Population 5 percent and 1 percent public-use samples.

Table 6.
Foreign-born to native-born ratios of earnings and earnings growth rates for immigrants, by year-of-entry cohort

CPS-defined year-of-entry immigrant cohort	Ratio of foreign- to native-born median earnings, measured the year after the CPS-defined period of entry and 10 years later								Ratio of foreign- to native-born earnings growth rates: earnings growth measured over 10 years			
	Men				Women				Men		Women	
	Unadjusted		Adjusted [a]		Unadjusted		Adjusted [a]					
	First year [b]	10 years later	First year [b]	10 years later	First year [b]	10 years later	First year [b]	10 years later	Unadjusted	Adjusted [a]	Unadjusted	Adjusted [a]
Immigrants who responded on the CPS that they came to the United States to stay in:												
1960–1964	1.00	1.01	1.00	1.04	1.04	1.05	1.08	1.06	1.00	1.08	1.03	0.96
1965–1969	0.71	0.71	0.83	0.80	1.05	0.95	1.18	1.07	1.00	0.94	0.83	0.83
1970–1974	0.62	0.71	0.72	0.86	0.98	1.07	1.03	1.05	1.31	1.42	1.15	1.04
1975–1979	0.61	0.73	0.68	0.79	1.02	0.90	1.08	0.96	1.49	1.40	0.74	0.77
1980–1981	0.49	0.69	0.54	0.75	0.77	0.87	0.81	0.94	2.11	2.09	1.32	1.34
1982–1983	0.54	0.85	0.60	0.92	0.71	0.93	0.76	0.97	2.84	2.56	1.73	1.66

SOURCE: Estimates are based on the 1994 March Current Population Survey (CPS) matched to Social Security longitudinal individual earnings records.

a. Adjusted for foreign-born/native-born differences in age and education, by evaluating natives' earnings at each foreign-born cohort's age and education distribution (Duleep and Dowhan 2002).

b. The first year is defined as the year following the CPS-defined period of entry.

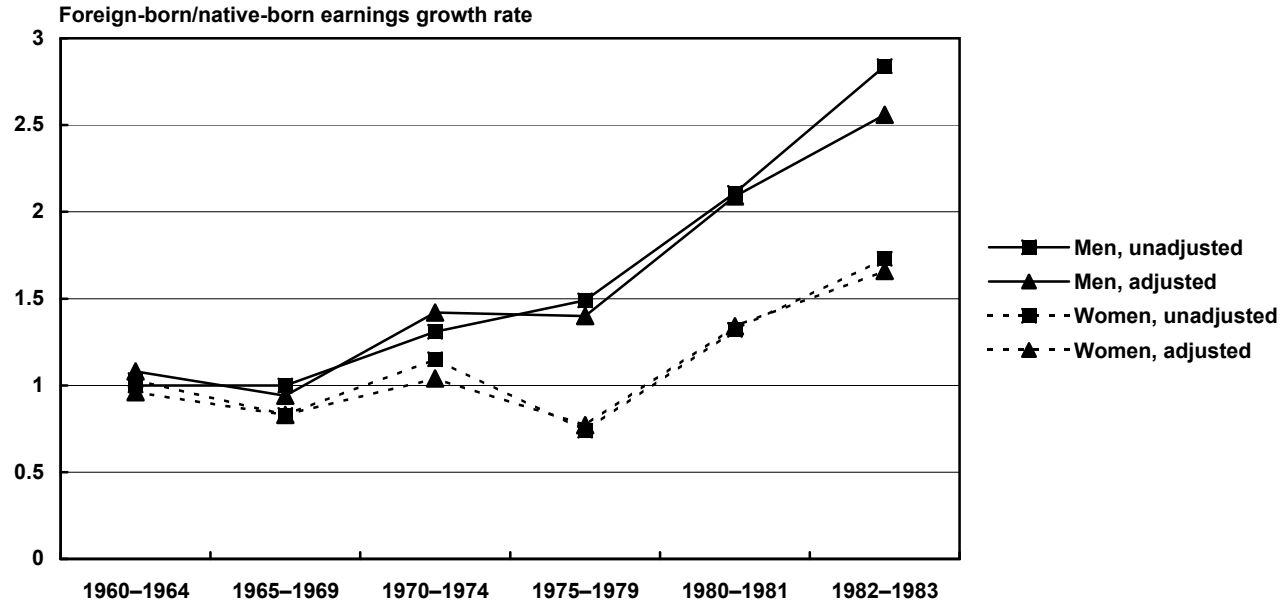
in the 1960–1964 period earned on a par with U.S. natives; those who immigrated in the 1965–1969 period earned only 17 percent less than their U.S.-born statistical twins; and those who immigrated after 1969 earned 28 percent to 46 percent below the earnings of comparable natives, with an unadjusted foreign-born deficit ranging from 38 percent to 51 percent. The data on women tell a similar story: The entry earnings of the pre-1980 foreign-born cohorts equal or exceed the earnings of their U.S.-born counterparts; for the post-1979 cohorts, a 23 percent to 29 percent unadjusted, and 19 percent to 24 percent adjusted, earnings deficit emerges.

At the 10-year mark, substantial earnings convergence occurs because as the relative entry earnings of immigrants have fallen, their relative earnings growth has generally increased. When we examine ratios of foreign-born to U.S.-born earnings growth rates we see that the growth rates of the early cohorts of immigrant men equal or closely approximate those of U.S.-born men (the right-hand side of Table 6).[27] Then, starting with the 1970–1974 cohort, the earnings growth rates exceed those of the U.S. born.[28] Echoing the results for immigrant men, immigrant women show declining entry earnings and increasing earnings growth. The earnings growth rates of immigrant women range from equaling those of U.S-born women, to surpassing them. However, the transformation occurs later for immigrant women than it does for immigrant men; starting with the 1980–1981 cohort, foreign-born women have higher-earnings growth than their U.S. counterparts.[29]

Chart 4, which illustrates the unadjusted and adjusted growth-rate ratios from Table 6, underscores two key points: (1) post-1969 immigrants tend to have faster earnings growth than natives; and (2) for both men and women the earnings growth of immigrants, relative to natives, has increased in recent years, as the relative entry earnings of immigrants has decreased.[30]

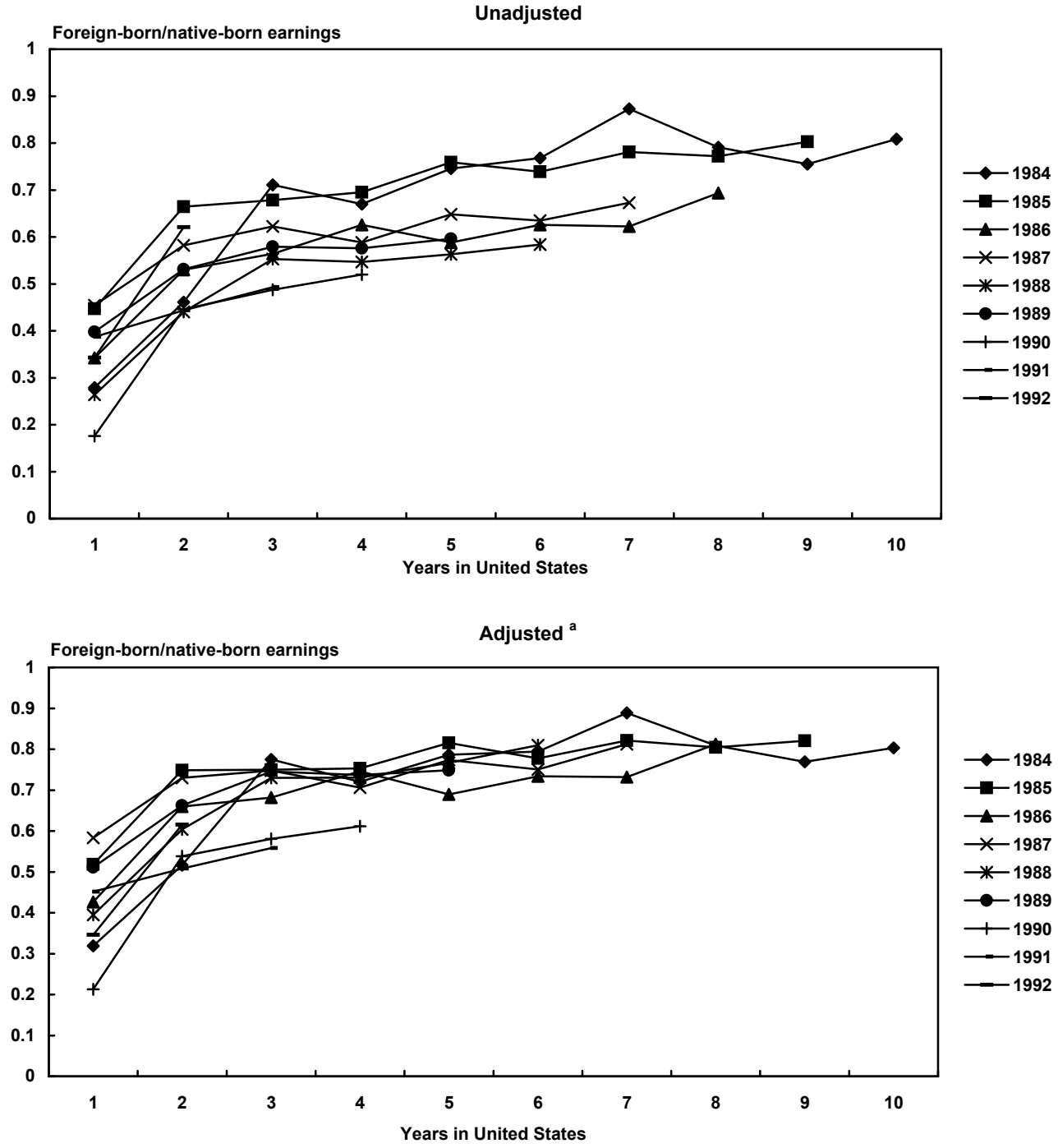
Chart 5 (top panel) uses Social Security earnings data to trace the earning profiles of immigrant men in nine cohorts, relative to U.S.-born men through the year 1993, with the earliest cohort's earnings beginning in 1984 and the most recent cohort's first year of earnings being recorded in 1992. The analysis is repeated in the bottom panel of the chart, but adjusts for foreign-born/native-born differences in age and education. This chart highlights another important point—although immigrant earnings profiles have changed dramatically over time, the adjusted earnings profiles of recent, post-1980, immigrant cohorts are remarkably similar.

Chart 4.
Cohort-specific ratios of foreign-born to native-born 10-year earnings growth rates



SOURCE: Estimates of earnings growth rates are based on longitudinal Social Security Administration earnings data matched to the 1994 March Current Population Survey.

Chart 5.
Ratio of foreign-born to native-born median earnings of men, by years in the United States among recent immigrant cohorts



SOURCE: Earnings estimates are based on longitudinal Social Security Administration earnings data matched to the 1994 March Current Population Survey.

a. Adjusted for foreign- and native-born differences in age and education.

Age at Entry, Education, and Interactive Effects

Relative to natives, the entry earnings of immigrants with a high school education or less are lower for those who enter the United States at older working ages compared with those who enter at younger working ages. This relationship holds for each entry cohort (Table 2) and across regions of origin (Table 3).

For adult immigrants younger than age 40, education's effect on earnings is most apparent in the long run. This finding emerges by comparing, at entry and 10 years later, the earnings ratio of immigrants with more than 12 years of schooling to those with 12 years or less. For both the cohorts who entered the United States in the 1965–1970 and 1975–1980 periods, the beneficial effect of education on earnings increases markedly with length of time in the country for immigrants from all source regions (Table 7). Among immigrants in the more recent cohort, the initial earnings of the more-educated immigrants exceed the earnings of less-educated immigrants by 30 percent. Ten years later, the earnings of the more educated are double those of the less educated.

There may also be interactive effects between skill transferability and education that influence how education affects the propensity to invest in human capital.[31] In most human capital models, prior education or experience has an ambiguous effect upon investment decisions: An increase in an individual's education increases the opportunity cost of time spent in human capital investment, but it will also most likely increase the productivity of that time. In the IHIC model, source-country human capital that is not valued in the destination-country labor market is still useful in gaining new skills. Because low skill transferability reduces the opportunity cost of human capital investment more than it reduces its productivity, the lower the degree of skill transferability, the greater the likelihood that highly educated immigrants will invest more than poorly educated immigrants. If natives are the special case of perfect skill transferability, we would expect education to have a more positive effect on further human capital investment for immigrants than for natives; the lower the skill transferability of immigrants, the more this would be true. Consistent with these theoretical expectations, Duleep and Regets (2002) find that the earnings growth of the more educated versus the less educated is higher among immigrants coming from economically developing countries than it is for immigrants coming from economically developed countries.

Table 7.
Earnings ratio of high education immigrants to low education immigrants at U.S. entry and 10 years later for men aged 25–39

	1965–1970 cohort		1975–1980 cohort	
	Ratio at immigrant entry [a]	Ratio 10-years later [b]	Ratio at immigrant entry [c]	Ratio 10-years later [d]
All	1.26	1.83	1.30	2.05
Central/South America	1.29	1.53	1.17	1.75
Asia	1.25	2.18	1.27	1.68
Europe	1.29	1.67	1.50	1.61

SOURCES: Estimates are based on the 1970 Census of Population 1 percent state public-use sample based on the 5 percent questionnaire, the 1980 Census of Population 5 percent "A" public-use sample, and a 6 percent microdata sample created by combining and reweighting the 1990 Census of Population 5 percent and 1 percent public-use samples.

The ratios in this table are based on earnings estimates presented in Duleep and Regets, "The Elusive Concept of Immigrant Quality: Evidence from 1970–1990," and Program for Research on Immigration Policy (revised version), Discussion Paper PRIP-UI-41, Washington, DC: Urban Institute.

NOTE: The education categories are 1–12 years (low education) and 13 or more years (high education).

a. The annual 1969 earnings, as measured by the 1970 Census, of immigrant men who entered the United States in the 1965–1970 period.

b. The annual 1979 earnings, as measured by the 1980 Census, of immigrant men who entered the United States in the 1965–1970 period.

c. The annual 1979 earnings, as measured by the 1980 Census, of immigrant men who entered the United States in the 1975–1980 period.

d. The annual 1989 earnings, as measured by the 1990 Census, of immigrant men who entered the United States in the 1975–1980 period.

Conclusion : Research Findings on Immigrant Earnings Trajectories

This article highlights variations, over time and across groups, in immigrant-earnings patterns.

For immigrants, as with U.S. natives, human capital (often measured by age and years of schooling) affects earnings. Thus in efforts to model immigrant earnings—the topic of the next two articles—variables that are relevant to modeling the earnings of U.S. natives are also relevant to modeling the earnings of U.S. immigrants.

In addition, the degree to which human capital transfers to the U.S. labor market affects the earnings of immigrants. If the human capital that immigrants possess transfers easily to the U.S. labor market, immigrant earnings profiles resemble those of similarly educated and experienced U.S. natives. The less home-country skills transfer to the U.S. labor market, the lower the initial earnings of immigrants, relative to otherwise similar U.S. natives, but the higher their earnings growth—a phenomenon that likely reflects a higher propensity to invest in U.S. human capital.

A key predictor of immigrant skill transferability, hence immigrants' initial and subsequent earnings, is the source country's level of economic development. Immigrants from countries with economic opportunities resembling those in the U.S. tend to have earnings profiles resembling those of U.S. natives. Immigrants from economically developing countries tend to have earnings profiles with lower initial earnings, but higher earnings growth than otherwise similar U.S. natives. Indeed the level of economic development of an immigrant's source country is so important that it can sometimes trump what one would otherwise consider an essential predictor of immigrants' initial earnings—proficiency in English. The source country's level of economic development also appears to influence the relationship between an immigrant's level of education and earnings growth.

Immigrant earnings profiles have changed over time. As the country-of-origin mix of U.S. immigration shifted from primarily European and Canadian to primarily Asian and Hispanic, immigrant entry earnings decreased and earnings growth increased, a transformation that persists within age and education categories. This transformation most likely reflects an increase in the proportion of immigrants from economically developing countries and a concomitant decrease in the proportion of immigrants with skills that immediately transfer to the U.S. labor market. Moreover, even for the same countries of origin, immigrant-earnings profiles have changed with the passage of time. Such within-country transformations most likely reflect changes in the relative economic conditions of source countries relative to the United States as well as responses to U.S.-admission policy changes.[32]

Holding age and years of schooling constant, a persistent pattern emerges regardless of whether immigrant earnings patterns are analyzed over time, or across groups, or both: There is a strong inverse relationship between immigrant entry earnings and earnings growth. The inverse relationship yields several implications for estimating immigrant earnings growth.

In situations where immigrant entry earnings (adjusted for age and education) are changing, the inverse relationship invalidates both the cross-sectional and stationary-earnings-growth methods for estimating immigrant earnings growth. In a situation where the adjusted entry earnings of immigrants are falling (as has occurred in the post-1950 United States), the inverse relationship implies that the stationary-earnings-growth method will underestimate the earnings growth of recent cohorts, whereas the cross-sectional method will overestimate the earnings growth of earlier immigrant cohorts. The fact that the cross-sectional method provides accurate estimates for recent immigrant cohorts reflects the fact that as immigrant entry earnings have fallen, earnings growth has increased to such an extent that the adjusted earnings of recent immigrants after 10 to 15 years in the United States closely approximate the earnings, at the 10- to 15-year mark, of earlier immigrants. Despite considerable variation over time in the age- and education-adjusted initial earnings of immigrants, when measured after 10 to 15 years in the United States, the adjusted earnings of immigrants show little change.

In the articles that follow this one (Duleep and Dowhan 2008a, 2008b), these findings and insights are used to help guide the representation of immigrant-earnings trajectories and emigration patterns in policy models.

Notes

[1] Various laws, enacted in several years, worked to exclude almost all immigration from Asia. For a synopsis, refer to Duleep (1988, Chapter 2). There was also a preference system in place that allocated quota visas among applicants on the basis of occupational skills (see Hutchinson 1981): Among immigrants from Eastern Hemisphere coun-

tries, half of all visas were granted on the basis of occupational skills.

[2] The occupational skills classification included two components: (1) workers, skilled and unskilled, in occupations for which labor is deemed scarce in the United States; and (2) professionals, scientists, and artists of exceptional ability. The Immigration Act of 1990 increased occupation-based admissions from 54,000 to 140,000 a year. It also placed a ceiling of 10,000 on unskilled workers within the occupation-based admissions, and it imposed an education requirement on a lottery program increasing admissions from countries "adversely affected" by the Immigration and Nationality Act Amendments of 1965. These reforms were not sufficient, however, to alter the essentially family-based nature of U.S. immigration (Lowell 1996).

[3] For information on the numbers of legal immigrants by decade, refer to the companion piece to this article—"Adding Immigrants to Microsimulation Models," (Duleep and Dowhan 2008a).

[4] See, for instance, Park, Miller, and Thompson (1921) and Park's (1950) collected works published posthumously and edited by Everett Hughes.

[5] The term "year of entry" is used throughout this article even though Duleep and Dowhan (2002)—and earlier papers by them using matched survey and Social Security data—show that people may have worked in the United States before the year they reported to the survey as being their year of immigration. The census and CPS ask immigrants, "When did you come to stay in the U.S.?" as opposed to "When did you first come to the U.S.?" As shown in Duleep and Dowhan (2002), the question asking about intent to stay does appear to yield information on permanence, which is an important determinant of immigrant earnings profiles. The conclusions reached in this article persist regardless of whether *year of entry* is defined by an immigrant's first earnings in the United States or by the year given as a response to the "when-did-you-come-to-stay" question (Duleep and Dowhan 2002).

[6] Note that 1965–1970 refers to 1965 through April 1970, when the 1970 census was taken. This detail, which is true for any given census's most recent year-of-immigration period, will be assumed throughout the article when we refer to the year-of-immigration period that includes the census year.

[7] To an unknown extent, the reported annual earnings for the year preceding the census reflect earnings gained abroad or incomplete annual earnings for immigrants who entered the United States during the year. Conclusions concerning changes in the entry earnings of immigrant cohorts will be unaffected if the rate of immigrant entry within the census year-of-migration categories is similar across the entry cohorts considered.

[8] The 1969 to 1989 decline across year-of-entry cohorts within the age/education categories is not continuous for all of the age/education groups. There is a continuous decline in relative earnings for the group aged 40–54 with 1–12 years of schooling. For the other three age/education groups, there is a slight increase from 1979 to 1989. Refer to Fix and Passel (1994) and Simon and Akbari (1995) for analyses of trends in the educational attainment of immigrants. Both studies show that although immigrant education levels have risen in recent years, the increase for immigrants was somewhat less than the corresponding increase for natives.

[9] When countries have relatively egalitarian income distributions, as discussed in Borjas (1992b, 429), "…the source country in effect 'taxes' able workers and 'insures' the least productive against poor labor market outcomes. This situation obviously generates incentives for the most able to migrate to the U.S. and the immigrant flow is positively selected.... Conversely, if the source country offers relatively high rates of return to skills (which is typically true in countries with substantial income inequality...), the United States now taxes the most able and subsidizes the least productive. Economic conditions in the U.S. relative to those in the country of origin become a magnet for individuals with relatively low earnings capacities, and the immigrant flow is negatively selected."

[10] In an empirical test of the income distribution–immigrant ability thesis, Borjas (1987) found the extent of income inequality of source countries to be negatively associated with the relative quality of U.S. immigrants, as measured by the wage differential between entering immigrants and natives of the same education level. A potential specification error of the empirical test of the income distribution–immigrant ability thesis is that the relevant distribution for a potential emigrant, in an analysis that focuses on immigrant earnings controlling for education, is the earnings distribution associated with that person's level of education, not the income distribution of the entire country, which was used in the empirical analysis (Borjas 1987). This would not be a problem if there was a high correlation between the overall income distribution of a country and the income distribution that individuals with specific levels of education face. Yet, the overall earnings distributions of countries may have little relationship to the earnings distributions of individuals with specific levels of education. To give an example, a country with a large proportion of illiterates and a large proportion of Ph.D.'s would have an extremely unequal income distribution relative to the overall income distribution of the United States. Yet, the earnings distribution of Ph.D.'s might be narrower in that country than the earnings distribution of American Ph.D.'s. In such a case, it would be the higher quality Ph.D.'s that would have the most to gain by migrating to a country that would reward their higher abilities.

[11] If all factors remain unchanged, higher ability individuals would theoretically be expected to invest in more human capital than lower ability individuals, which would lower the initial earnings of the higher ability group.

[12] Chart 1 shows by country of origin the 1989 median initial earnings of working-age immigrant men who entered the United States between 1985 and 1990. The 1989 median

earnings estimates for the 1985–1990 cohort shown in the chart are based on a 6 percent microdata sample created by combining and reweighting the 1990 Census of Population 5 percent and Public-Use 1 percent samples. Technical documentation may be found for the 1990 census data in Census Bureau (1992).

[13] Asian immigration is dominated by immigration from less-developed countries. In Table 3, Asia includes Japan.

[14] The 1987 per adult GDP of each source country is shown as a percent of the U.S. per adult GDP. The observations in Chart 3 on U.S. median earnings for immigrant men and GDP per adult as a percent of U.S. GDP per adult are for the following countries: Argentina, Australia, Bangladesh, Bolivia, Brazil, Canada, Chile, China, Colombia, Costa Rica, Czechoslovakia, Dominican Republic, Ecuador, Egypt, El Salvador, Fiji, France, West Germany, Greece, Guatemala, Guyana, Haiti, Honduras, Hong Kong, Hungary, India, Indonesia, Iran, Ireland, Israel, Italy, Jamaica, Japan, Jordan, the Republic of Korea, Laos, Malaysia, Mexico, Morocco, Myanmar, Netherlands, New Zealand, Nicaragua, Nigeria, Pakistan, Panama, Peru, Philippines, Poland, Portugal, Romania, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Syria, Taiwan, Thailand, Trinidad and Tobago, Turkey, Union of Soviet Socialist Republics (USSR), United Kingdom, Venezuela, and Yugoslavia. All countries for which we had information on the GDP per adult were included. Median earnings for immigrant men in the 1985–1990 cohort from the 65 countries listed above were estimated using a 6 percent microdata sample created by combining and reweighting the 1990 Census of Population 5 percent and Public-Use 1 percent samples. The statistics on GDP per adult as a percent of U.S. GDP per adult are from Heston and Summers (1991).

[15] When the median 1989 entry earnings of immigrant men in the 1985–1990 cohort are regressed on source-country GDP, the estimated coefficient indicates that the initial earnings of immigrant men increase $2,280 for each 10 percentage-point change in the country-of-origin GDP measure. The R^2 for this regression is .48.

[16] Borjas (1992a, 44) notes, "The changing national origin mix of successive immigrant waves cut by more than half the per capita GNP of the country represented by the typical immigrant, with most of this decline occurring after 1960."

[17] Cobb-Clark (2004) also finds "anomalous" results indicating no relationship between English language proficiency and labor market employment experience among a recent cohort of Australian immigrants.

[18] In addition, individuals' superior knowledge of their own abilities will be used in making their human capital investment decisions.

[19] The Duleep/Regets Immigrant Human Capital Investment (IHCI) model is conditional on initial levels of human capital, as measured by education and age. Empirically, they find evidence of a very strong inverse relationship between initial earnings and earnings growth conditional on education and age, as well as an unconditional relationship that generally holds up.

[20] In describing their methodology Duleep and Regets (2002) write, "Median earnings were measured within education and age subsets for 24 countries or regions of origin. (Median rather than mean earnings were used since the median is a much less volatile measure of central tendency in small samples.) Entry earnings were measured by the earnings reported in 1980 by the 1975–1980 entry cohort. The earnings growth rate of each of the country, age, and education groups was then measured by the difference between their 1980 earnings and their respective earnings 10 years later, as measured by the 1990 census, dividing the difference by their 1980 earnings. An alternative approach would be to first estimate a parametric model and then, using the predicted values, estimate the correlation between the predicted entry earnings and predicted earnings growth. Although our approach ignores information beyond the median within each age/education/country cell, we can be very certain that our results are not the product of a particular set of model assumptions."

[21] Refer to note 5.

[22] Attrition is a problem in all analyses that follow individuals or cohorts over time. Although we can assume that the mortality of the foreign and native born is similar, attrition as a result of emigration will affect the foreign born far more than the native born. For an analysis of determinants of foreign-born emigration from the United States and reviews of other related research, refer to Duleep (1994) and Ahmed and Robinson (1994).

[23] Although these results suggest that the earnings of recent immigrants approach those of natives, they do not imply that the earnings of recent immigrants, will on average, exceed those of natives. According to the IHIC model, the incentive for human capital investment decreases with age and as source-country human capital becomes more transferable; it suggests that the strength of the inverse relationship between initial earnings and earnings growth decreases with immigrant time in the United States. This theoretical expectation is supported in research following immigrants for 20 years. Duleep and Regets (2002) found that although the inverse relationship continues beyond the initial 10-year period (the earnings growth increase associated with lower initial earnings continues beyond the initial 10-year period), it is about one-third of the 10-year effect. The decrease in the ratio of immigrant-to-native earnings growth rates is also apparent in the longitudinal data discussed in the section "Evidence from Longitudinal Data" below.

[24] This strong inverse relationship between relative entry earnings for an immigrant cohort and its subsequent relative earnings growth rate has been explored theoretically and empirically in a number of recent papers (Duleep and Regets 1992, 1994a, 1994b, 1996a, 1996b, 1996c, 1997a, 1997b, 1999, 2002).

[25] Their finding of a strong inverse relationship persists even when several methodological concerns are taken into account. In Duleep and Regets (1994a, 2002) a simple method to completely circumvent regression-to-the-mean bias in cohort analyses of entry earnings and earnings growth is introduced and used. In Duleep and Regets (1994a, 1994b, 2002), a method for testing the sensitivity of the estimated inverse relationship to the effects of emigration is introduced and applied.

[26] Refer to Duleep and Dowhan (1999a, 1999b, 2002) for earlier analyses using the Social Security matched longitudinal data focused on the trend in foreign- and native-born earnings growth and the diverse ways these data can be used to study immigrant economic assimilation.

[27] The ratios are defined as $[(Y_{10} - Y_1)/Y_1]_F / [(Y_{10} - Y_1)/Y_1]_N$ where Y_1 and Y_{10} denote the beginning- and end-year earnings, and F and N denote foreign and native born.

[28] These foreign- and native-born differences in earnings growth rates are statistically significant at a .05 level. The 1984–1985 and 1986–1987 cohorts are exceptions to the pattern of increasing earnings growth, possibly reflecting the newly legalized Immigration Reform and Control Act (IRCA) immigrants, as well as relatively high unemployment rates for these years.

[29] These differences are statistically significant at a .05 level.

[30] As discussed in note 23, the empirical fact of faster earnings growth for recent immigrants does not imply that recent immigrants will eventually surpass the wages of the native born. Theoretically, one would expect the relative earnings growth advantage of the foreign born to the native born to be highest in the initial years of earning in the United States and to decrease with time in the country. This is borne out empirically. Dividing time of earning between first 5 years, and 5 years and beyond (as illustrated in Charts 5 and 6), one can see that the slope of the foreign- and native-born median earnings lines decreases with immigrant time in the United States.

[31] The IHCI model (Duleep and Regets 1999, 2002) predicts that both age at entry and education have important interactive effects on the inverse relationship between entry earnings and earnings growth. At younger ages and at higher education levels, the inverse relationship between immigrant entry earnings and earnings growth is intensified.

[32] The restrictive nature of the pre-1965 admission policy meant that post-1965 migrants from countries whose immigration had been severely restricted generally lacked immediate U.S. family members. They were therefore most likely to immigrate under the employment preference provisions and thus the initial immigrants were more likely to have transferable skills to the U.S. labor market. As they established a U.S. base, relatives with less transferable skills could enter under the family admission categories. For instance, the entry earnings of working-age Korean men were 75 percent of the earnings of working-age U.S.-born men for the cohort of immigrants who entered the United States in the 1965–1970 period and 44 percent of the U.S. native 1985–1990 cohort.

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Adding Immigrants to Microsimulation Models

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Summary

Forecasts of the financial status of Social Security's Old-Age, Survivors, and Disability Insurance (OASDI) programs and forecasts of the effects of various OASDI policy options on Americans would be improved if information about the earnings and labor force behavior of various population subgroups were included in projection models. Focusing on the projection of immigrant earnings, this article proffers a conceptual basis for incorporating immigration into microsimulation models. Key results from research on immigrant earnings, as described in the first article in this trilogy—"Research on Immigrant Earnings"—are linked to methods for forecasting individual earnings in microsimulation models. The research on immigrant earnings also inspires new methods for forecasting earnings in microsimulation models as well as the projection of immigrant emigration. Forecasting immigrant earnings and emigration is discussed in the context of a "closed system"—that is, forecasts are only made for a *given* population, which is represented in the base sample of the microsimulation model. The third article in our trilogy—"Incorporating Immigrant Flows into Microsimulation Models"—explores how to project immigrant earnings in the context of an "open system," which includes future immigrants.

Introduction

With the end of World War II, but particularly since the 1960s, immigration to the United States increased dramatically. From 1941 through 1950, a million immigrants were issued permanent U.S. visas; for 1951–1960, 2.5 million; 1961–1970, 3.3 million; 1971–1980, 4.5 million, and for 1981–1990, 7.3 million.[1] Over 9 million individuals immigrated in the 1990s rivaling in absolute (though not percentage) terms immigration in the 20th century's first 10 years, when a record number of immigrants entered the United States (U.S. Immigration and Naturalization Service (INS) 1998).[2] Over the decade ending in 2005, foreign-born workers comprised more than half of the growth in the labor force (Congressional Budget Office 2005).

Models are used to project the financial status of programs and to project the effects of program changes. This can involve projecting key characteristics for a given population and may involve projecting future additions to that population. For the Old-Age, Survivors, and Disability Insurance (OASDI) programs, commonly known as Social Security, forecasts of the financial status involve projections of the contributions into and benefits from the system for the current population and those of the future.

Policy modelers are just beginning to grapple with how best to integrate immigration into their models. Once they have taken into account immigrant/native differences in demographic and human capital characteristics, modelers must decide whether to distinguish the labor force behavior of immigrants from that of seemingly similar U.S. natives and whether to differentially represent the earnings and work patterns of various immigrant groups. This article addresses these and other issues as it proffers a conceptual basis for incorporating immigrant earnings into a key type of policy model—microsimulation—with a focus on modeling the relationship between immigration and Social Security.

Social Security, Immigration, and Microsimulation

Each year the Social Security Administration (SSA) forecasts the financial status of Social Security. The explicit treatment of immigrants in the actuarial forecasts is purely demographic: The Office of the Chief Actuary (OCACT) projects net immigration as part of its projection of the population that contributes to and benefits from Social Security. OCACT also estimates trends in economic variables, such as how much people work and earn. The economic trends are estimated for the U.S. population that includes both natives and immigrants and are imposed upon the projected demographic trends. In general, there is no explicit treatment in the actuarial projections of potential differences between immigrants and natives in labor force variables such as earnings.[3]

Social Security benefits are based on lifetime earnings. Knowing more about how immigrant earnings trajectories compare with those of natives and how these trajectories vary across groups of immigrants would establish a more explicit basis for describing the economic impact immigrants have on the Social Security system. Ideally, modelers would predict contributions to and benefits from the Social Security system for the current immigrant population based on characteristics that capture distinctive features of their U.S. earnings trajectories. With continuously available data on these characteristics, the projections could be annually updated using information on each year's incoming immigrants. Such a procedure would supplement the long-range actuarial forecasts and more clearly illuminate the relationship of immigrants to the Social Security system.

Dynamic microsimulation models provide a vehicle for projecting the earnings of individuals and the concomitant impact of those earnings on contributions to and benefits from the Social Security system.[4] Starting with data on individual characteristics such as age, years of schooling, and past work behavior for a representative sample of the population of interest, a microsimulation model forecasts the behavior of each individual in the sample. The simulations are based on the best information available concerning the relationship between the behavior in question (for example, earnings) and the selected predictors (for example, age, years of schooling, and past work behavior).

The simulations provide a snapshot of the current population's future. In this way, microsimulation makes it possible to incorporate distributional characteristics into the projection methodology and to produce distributional results.

To estimate aggregate values, such as population totals and averages, modelers can simply sum over the projected individual outcomes—one of several key advantages of microsimulation models. Most research on human behaviors relevant to Social Security—such as earnings, labor force behavior, disability and mortality, and disability—is done at the level of the individual. Moreover, the relationship between the explanatory variables (the determinants of the behaviors of interest) and the behaviors is nonlinear. A relationship is nonlinear if the effect of an explanatory variable on the variable of interest varies by the level of the explanatory variable or if its effect varies with the level of other explanatory variables. The relationship between income and mortality is an example of a nonlinear relationship. Changes in income have a very large effect on the probability of death for individuals at low levels of income and very small effects at high levels of income (Duleep 1986a).[5] Moreover, income's effect on mortality is affected by other variables, such as marital status (Smith and Zick 1994; Zick and Smith 1991). Yet, despite the ubiquity of nonlinear relationships in models of human behavior, there is no known way of aggregating nonlinear relationships.[6] The microsimulation approach—summing over individual outcomes to produce aggregate values of interest—provides a straightforward method of utilizing microanalytic research to project aggregate values of interest.

In addition to using microsimulation to predict Social Security contributions and benefit receipts of the current population, it also can help gauge the

effects of proposed and actual policy changes on the financial status of the Social Security system (Burtless 1994; Social Security Administration 1995). The validity of such estimates rests on how accurately relevant behaviors of various population subgroups, such as immigrants, are modeled.

Incorporating Immigrant Earnings Research into Microsimulation Models

The preceding article's review of research on immigrant earnings patterns (Duleep and Dowhan 2008) highlights the following five findings with important implications for projecting immigrant earnings contributions to the Social Security system.

(1) Controlling for demographic and human capital characteristics, immigrants often start their U.S. lives with substantially lower earnings but experience faster earnings growth than natives with comparable years of schooling and experience. The lower immigrants' initial earnings are (relative to U.S. natives), the higher their subsequent earnings growth is. Thus the initial earnings of immigrants, relative to their U.S.-born statistical twins, provide valuable information about immigrant earning trajectories.

(2) The extent to which the earnings trajectories of immigrants and natives differ varies by country of origin, with the source country's level of economic development being the key determinant of the size of the U.S.-born/foreign-born difference. The earnings profiles of immigrants from economically developed countries such as Japan, Canada, or Western Europe resemble those of U.S. natives who are of the same age and education level. In contrast, the earnings of immigrants from developing nations tend to start well below those of U.S. natives with comparable years of schooling and experience, but rise more rapidly.

(3) Immigrant earnings profiles have changed over time. For both immigrant men and women, the earnings profiles of recent immigrants, particularly those who entered the United States in 1980 and afterwards, are characterized by low initial earnings and high earnings growth relative to statistically similar U.S. natives. Earlier immigrant cohorts, particularly those who entered the United States before 1970, have earnings profiles that resemble those of statistically similar U.S. natives. Compared with recent cohorts, earlier immigrant cohorts have high initial earnings and low earnings growth.

(4) Although immigrant earnings profiles have changed dramatically over time, the adjusted earnings profiles of post-1980 immigrant cohorts are remarkably similar.

(5) Holding age and years of schooling constant, a persistent pattern emerges over time and across groups: There is a strong inverse relationship between immigrant entry earnings and earnings growth.

The remainder of this article links these and other research results to various issues essential for incorporating immigrant earnings into microsimulation models. Beginning with the next section, we link key results from research on immigrant earnings, described in Duleep and Dowhan (2008), to extant methods for forecasting individual earnings in microsimulation models. Inspired by the research on immigrant earnings, we then propose new methods for forecasting individual earnings and then explore an often-overlooked phenomenon—some immigrants emigrate. Although illegal aliens, also known as undocumented immigrants, are represented to an unknown degree in many survey data sets, the penultimate section confronts the challenges of explicitly representing the undocumented in microsimulation models. The article concludes with a discussion about the choice of variables that can be used to predict immigrant earnings in microsimulation models.

The discussion proceeds in terms of a closed system. That is, we examine a system in which immigrant earnings (and emigration) are forecast for a *given* population that the base sample represents in the microsimulation model. The last article in the trilogy, which follows this one, addresses immigrant earnings projections for open systems—microsimulation models that include projections of future immigration.

Immigrant Earnings Research and Extant Methods for Forecasting Individual Earnings in Microsimulation Models

There are three general methods used to forecast individual earnings in microsimulation models: the "human capital" approach, the "past-is-prologue" approach, and the "donor" approach.[7]

The Human Capital Approach

The human capital approach to project earnings in microsimulation models estimates the relationship between individual earnings and demographic and human capital characteristics, most notably age and education. The estimated coefficients are applied to the characteristics of each individual in the model's base population sample to project his or her future earnings.

The earnings regressions that inform microsimulation models have typically been estimated across the adult population, not distinguishing between the foreign and native born. The research review of Duleep and Dowhan (2008) demonstrates that such earnings projections will misrepresent the earnings profiles of recent immigrants; even controlling for age and education, the earnings profiles of recent immigrants differ from those of the U.S. born. Nor will it suffice to estimate an earnings regression on a sample that pools the foreign and native born and include a categorical variable (also known as a dummy or zero-one variable) to identify the foreign born. Such a strategy would work if immigrant earnings profiles resembled those of natives, but were uniformly lower. Recent immigrants generally start at lower earnings than the U.S. born and experience higher earnings growth.

To project immigrant earnings accurately, the earnings regressions that inform microsimulation models must be estimated separately for the foreign and native born. An implication of the inverse relationship between immigrant entry earnings and earnings growth is that the earnings growth of different year-of-immigration entry cohorts needs to be separately estimated, as opposed to estimating a pooled model that captures cohort effects with a dummy variable for each entry cohort.[8]

Because the earnings profiles of immigrants have changed markedly over time, accurately projecting the earnings of recent immigrants requires modelers to use earnings regressions estimated on recent immigrant cohorts. The regressions that inform the earnings projections of recent immigrants could be done, for instance, on a sample limited to immigrants that entered the United States after 1979.

There are also important differences in earnings profiles among immigrants divided by country of origin that are associated with source countries' level of economic development. Immigrants from economically developed countries have earnings profiles that resemble those of U.S. natives with similar years of education and experience. Initially, the earnings of immigrants from economically developing countries are much lower than their U.S.-born statistical twins, but rise more steeply.

Ideally, separate earnings regressions for recent immigrants from each source country would be estimated to capture these differences. Because sample size constraints make this impractical, a more feasible approach would be to estimate separately the immigrant earnings regressions for eight source-region categories: (1) Eastern Europe; (2) Western Europe, Oceania, and Japan; (3) Asia (except Japan); (4) Africa; (5) Canada; (6) Mexico, (7) Caribbean; and (8) Central and South America (except Mexico). Immigrants within these categories share similar earnings profiles, controlling for age at immigration and education. If the eight categories are still too many, then modelers could use the following four categories: (1) Economically developed countries (except Canada), (2) Canada, (3) Economically less-developed countries (except Mexico), and (4) Mexico. This division captures the economically developed versus less developed divide and, with the separate treatment of Canada and Mexico, the added dimension of proximity to the United States. If four categories were still too many, then a broad, but informative division simply would be to divide the world into two groups consisting of (1) the economically developed countries, and (2) the less-developed countries.

The "Past-Is-Prologue" Approach

In a nod to Shakespeare, a second approach for forecasting individual earnings in microsimulation models is the "past-is-prologue" approach (Iams and Sandell 1997): Earnings in earlier years predict earnings in later years. Underlying this approach is the idea that an individual's past earnings behavior captures both measured and unmeasureable factors that affect earnings (Nakamura, Nakamura, and Duleep 1990; Duleep and Sanders 1994). Iams and Sandell find that once past behavior is included, human capital variables contribute little further predictive power. The past-is-prologue approach requires a data source that follows the earnings of individuals over time or a survey with retrospective questions about past earnings.

In estimating the relationship between past and current earnings, it is important (as with the human capital approach) to separate the foreign born from the native born. Projecting future earnings using the estimated relationship between past and present earnings based on a sample of U.S. natives (or a sample in which natives dominate) would understate the future earnings of most recent immigrants, because recent immigrants tend to have higher earnings growth than natives. Moreover, to forecast accurately the earnings of recent immigrants, the past/present earnings relationship needs to be estimated on a sample of recent immigrants, such as immigrants who came to the United States after 1979, as opposed to a sample that represents earlier immigrants, or a sample that represents all immigrants regardless of year of entry. As

shown in the preceding article (Duleep and Dowhan 2008), the relationship between past and present earnings is flatter for earlier immigrants than it is for more recent immigrants.

Finally, it is important to estimate the past/present earnings relationship on samples that divide immigrants by region of origin. The relationship between past and present U.S. earnings for immigrants coming from economically developing countries is much steeper than that for immigrants coming from economically developed countries resembling the United States, and this is particularly true for recent immigrant cohorts (Duleep and Dowhan 2008).

The "Donor" Approach

A third approach for projecting earnings in microsimulation models might be labeled "the donor approach" or, more exotically, the "clone" approach. To project the future earnings of individuals, similar, but older, individuals are chosen to provide their earnings as forecasts for the individuals with incomplete earnings histories (Burtless, Sahn, and Berk 2002).

The donor approach may combine insights of both the human capital approach and the past-is-prologue approach. As in the human capital approach, evidence from "like" individuals is used to project the earnings of individuals, where the pool of potential donors is sometimes determined by characteristics, such as age and education, commonly included in earnings estimations. As in the past-is-prologue approach, one of the characteristics that may be used to define the pool of potential donors is the past earnings of individuals.

As applied in Social Security microsimulation efforts, donors who are 5 years older are chosen to provide their earnings in 5-year intervals as forecasts for the individuals with incomplete earnings histories. The donors are randomly chosen from a potential pool of individuals, determined by a set of variables for which a match must occur between the worker with the incomplete earnings history and the 5-year-senior potential donor. This requires that the donor's age during the matching period be identical to that of the target worker and that his or her earnings in the years up to and including the matching period be similar to those of the target worker.[9]

The immigrant earnings trajectories highlighted in the preceding article (Duleep and Dowhan 2008) suggest three lessons for the donor approach: (1) donors for immigrants should be immigrants, (2) donors chosen to project the earnings of recent immigrants should be recent immigrants, such as immigrants who came to the United States after 1979, and (3) donors for immigrants from economically developed (developing) countries should be immigrants from economically developed (developing) countries.

When Dividing by Nativity and Year of Entry is Less Critical

Regardless of whether modelers use the human capital, past-is-prologue, or donor approach to forecast earnings, the preceding article's review of research (Duleep and Dowhan 2008) provides guidance as to when dividing by foreign-born/native-born status is less critical in microsimulation models. Because the earnings trajectories of immigrants who entered the United States before 1970, for men, and before 1980, for women, resemble those of U.S. natives (Duleep and Dowhan 2008, Chart 4), it is less critical to divide by nativity for models focused on the earlier entrants. It is also less critical to divide by nativity for models focused on immigrants coming from economically developed countries than it is for models focused on immigrants from the economically developing world, or models focused on all recent immigrants, because immigrants from economically developed countries have earnings profiles that resemble those of U.S. natives of similar age and years of schooling. The inverse relationship between immigrant entry earnings and earnings growth means that, holding years of schooling and experience constant, the longer immigrants have been in the United States, the more their earnings approach those of similarly educated and experienced natives, regardless of their country of origin (Duleep and Regets 1994a, 1994b, 1997a, 2002; Duleep and Dowhan 2002, 2000). For microsimulation models, this finding implies that the importance of separately treating immigrants and natives, or groups of immigrants, wanes the longer immigrants have lived in the United States.

Depicting Immigrant Earnings Variation

In applying the research results on immigrant earnings to projecting immigrant earnings trajectories, one should be mindful of an important caveat. Research suggests that immigrants who come from economically developed countries have earnings profiles that resemble those of similarly schooled and experienced U.S. natives, whereas the earnings profiles of immigrants from economically developing countries are quite different. Yet not all immigrants from eco-

nomically developed countries have earnings profiles resembling those of their U.S.-born statistical twins, and not all immigrants from economically developing countries have trajectories characterized by low initial earnings and high earnings growth. Rather, within any group of immigrants originating from the same source country, a range of earnings profiles exists, with the percent of immigrants with low initial earnings and high earnings growth being higher among immigrants from economically developing versus developed countries. How successfully a model captures variations in earnings profiles will affect how accurately it can illuminate distributional issues. Depicting the *range* of immigrant earnings profiles is a challenge for microsimulation modelers.

The extent to which the past-is-prologue approach to modeling earnings captures variability in immigrant earnings profiles depends on the degree to which the measures of past earnings behavior that are used for prediction capture this variability. The success of the human capital approach in this regard depends on the degree of detail embedded in the parameterized equation used to relate the explanatory variables to earnings. Given sufficient sample size in the model's base population sample, the donor approach to modeling earnings in microsimulation models will, by design, be the most successful in representing variation in immigrant earnings profiles. This is because the individuals who "donate" the projected earnings profiles come from the existing population of immigrants and thus represent, in a completely nonparametric fashion, the extant variation in earnings profiles present within any demographic/human capital subgroup.

Immigration Research as a Catalyst for New Methods of Forecasting Earnings

The review of immigrant earnings research in the preceding article (Duleep and Dowhan 2008) also suggests new methods (or at least nuances in existing methods) for projecting earnings in microsimulation models.

The Predictive Power of Earnings Growth

A theme of the immigrant earnings research discussed in Duleep and Dowhan (2008) is the predictive power of earnings growth. Higher earnings growth distinguishes the earnings trajectories of immigrants from those of natives. It also distinguishes the earnings trajectories of immigrants who come from economically developing versus economically developed countries. Indeed, conditional on age and education, a few years of earnings growth may suffice to successfully identify in microsimulation models the earnings trajectories of the foreign born versus the native born as well as earnings variability within the foreign born.

An empirical test of this idea was a by-product of recent efforts to include immigration in Social Security's Modeling Income in the Near Term (MINT) microsimulation model. In one version of this model, donors are used to project earnings of workers up to age 55. Worker and donor must match on a set of variables that includes sex, education, disability status, race, ethnicity, and several earnings variables measured over a 5-year matching period (initially 1994–1998). The earnings variables include the number of years in which there are earnings in the 5-year matching period, average earnings for the 5-year matching period, earnings in the matching period's fifth year, earnings in the matching period's fourth year, and average earnings before the 5-year matching period.

The earnings variables are particularly important for the topic at hand because*, combined*, they provide information on earnings growth. If earnings growth (along with the standard demographic and human capital variables) suffices to accurately project immigrant earnings, then it should not be necessary to separately treat the foreign and native born in models that incorporate these variables in the projection methodology—a prediction that has proved correct.

When the MINT modelers included immigrant status as a matching constraint to ensure that immigrants from later cohorts received earnings from immigrants from earlier cohorts, little change occurred in the model's projected distribution of earnings.[10] The result suggests that a matching algorithm that includes earnings growth, along with the usual demographic/socioeconomic variables, may accurately project immigrant earnings. It also suggests that modelers may not need to divide immigrants by region of origin, or by their year of U.S. entry, or even to separate the foreign born from the native born as long as earnings growth is in the predictive model—a finding of particular import when the size of the microsimulation base population sample is constrained.

The Predictive Power of Immigrant Entry Earnings

When incorporating immigrant earnings into microsimulation models, a challenge is how to project earnings trajectories for recently arrived immigrants who lack a U.S. earnings history. The immigrant earnings

research in Duleep and Dowhan (2008) provides a potential solution.

The initial earnings of immigrants, relative to the earnings of U.S. natives of similar age and education, impart information about immigrants' future earnings—the lower (higher) the relative entry earnings of immigrants, controlling for age and education, the higher (lower) the subsequent earnings growth. This finding suggests that modelers could use the distance between the initial earnings of immigrants and that of similarly educated and experienced natives as a matching variable for selecting immigrant donors from earlier cohorts for the recently arrived immigrants. New immigrants would be assigned the earnings trajectories of earlier immigrants who had the same relative earnings starting point in the United States.

Alternatively, the relationship between immigrants' initial earnings, relative to similar U.S. natives, and subsequent earnings growth could be estimated and used to project the earnings trajectories of recently arrived immigrants. Modelers could amend the human capital approach for forecasting future immigrant earnings by adding as an explanatory variable the gap between immigrants' initial earnings and the earnings of U.S. natives with similar human capital attributes.

Not All Immigrants Stay: Predicting Immigrant Emigration

An often-ignored reality of immigration is that not all immigrants stay. When modeling immigrant earnings profiles (and benefit receipt) in microsimulation models, immigrant emigration requires special attention. It means that the U.S. earnings trajectories of some immigrants will be truncated. It is also likely that the propensity to emigrate and the "shape" of immigrant earnings trajectories (how high initial earnings are, how high earnings growth is) are related. The relationship between immigrant emigration and earnings profiles will affect how immigrants contribute to and benefit from Social Security.

A theme in the research review of Duleep and Dowhan (2008) is that immigrants who lack skills that transfer quickly to the U.S. labor market are more likely to invest in human capital. It follows that immigrants who lack transferable skills would be more likely to stay permanently in the U.S. than immigrants with highly transferable skills. Why invest if the rewards of the investment cannot be reaped? Indeed, it seems likely that immigrants who decide to come to the United States with the idea of investing in human capital would, from the outset, be more likely to see the country as their permanent home than would immigrants with highly transferable skills who do not intend to invest in U.S.-specific human capital.

In the absence of programs that recruit workers to fill specific labor market needs, immigrants from economically developing countries would tend to have lower U.S. skill transferability than immigrants from regions of the world with levels of economic development comparable to the United States. Following immigrant cohorts across decennial censuses, Duleep and Regets (2002) show that immigrants originating from economically developing countries have lower initial earnings, but higher earnings growth than those originating from economically developed countries. The inverse relationship between skill transferability and immigrants' propensity to invest in human capital suggests that immigrants from less economically developed countries would be more permanent than immigrants from countries similar to the U.S.

To test this hypothesis, we used 1980 and 1990 census data—the 5 percent public-use microdata sample (PUMS) files —to estimate 10-year attrition rates for immigrant cohorts who entered the United States during the 1975–1980 period, divided by age, sex, and economic-development status of the source country. Specifically, the number of immigrants who reported immigration to the United States from 1975 through 1980 was counted in the 1980 census and in the 1990 census. The 10-year attrition rates were then adjusted by the estimated 1980–1990 mortality of the cohorts. Of the proportion that was missing in the 1990 census, the percent that was estimated to have died was subtracted by applying the 1998 U.S. life tables by sex and single year of age to the age/sex/economic-development cohorts.[11] The remaining attrition is attributed to emigration.

In estimating the mortality of immigrants, one could argue that race/ethnicity-specific mortality information should be applied to the attrition rates. Recent studies, however, hint that immigrants face lower mortality rates than their U.S.-born racial/ethnic counterparts.[12] For this reason, and in the absence of actual information on immigrant mortality, the U.S. sex- and age-specific national statistics were used to adjust our immigrant attrition rates for mortality.

The resulting mortality-adjusted, 10-year attrition rates represent estimates of immigrant emigration, as shown in Table 1. As theoretically anticipated, the emigration rates of immigrants from less economically developed countries are lower than those of immi-

Table 1.
Emigration rates over 10-years, based on analysis of 1980 and 1990 census 5 percent PUMS and national mortality data

Age group	1980 to 1990 raw attrition rate [a]		10-year mortality rate from sex- and age-specific mortality applied to individual 1980 data		Residual emigration rate	
	Men	Women	Men	Women	Men	Women
			Developed countries			
15–39	0.3507	0.3292	0.0185	0.0089	0.3322	0.3203
40–56	0.3518	0.2590	0.0650	0.0403	0.2868	0.2186
57–69	0.4704	0.4592	0.2308	0.1568	0.2396	0.3023
			Developing countries			
15–39	0.0937	0.0609	0.0170	0.0080	0.0767	0.0529
40–56	0.1677	0.1062	0.0658	0.0415	0.1019	0.0646
57–69	0.3565	0.2803	0.2325	0.1534	0.1241	0.1269

SOURCE: The mortality data are from Table 2. Life table for males: United States, and Table 3. Life table for females: United States, Public Health Service, National Vital Statistics Report, Vol. 48, No. 18 (February 7, 2001).

NOTE: PUMS = public-use microdata sample.

a. The raw attrition rate is defined as [(the number of immigrants in the 1980 5 percent PUMS who entered the United States during the 1975–1980 period) - (the number of immigrants in the 1990 5 percent PUMS who entered the United States during the 1975–1980 period] / [(the number of immigrants in the 1980 5 percent PUMS who entered the United States during the 1975–1980 period)]. This statistic is computed for age, sex, and economic development categories, wherein the age category is aged 10 years when counting the number of immigrants in the 1990 PUMS.

grants from more economically developed countries, particularly at younger ages when the propensity to invest in human capital is greatest.

The emigration estimates shown in Table 1, based on two points in time separated by 10 years, do not convey the year-to-year pattern of emigration in the years before 10 years, or the emigration that occurs after 10 years. This information may be needed to model immigrant emigration in microsimulation models.

Research based on 1908–1950 U.S. emigration data (Warren and Kraly 1985) and research using 1971–1976 Social Security administrative data on retired immigrant emigrants (Duleep 1994) coupled with theoretical considerations suggest that the propensity of immigrants to emigrate declines the more time they spend in the United States. This pattern can be expressed as the exponential decay function $y = d + ae^{-bx}$

where:

y = the number of immigrants in the United States after x years,

d = the number of immigrants who will never emigrate,

a = the total number of people who will emigrate, and

x = the number of years.

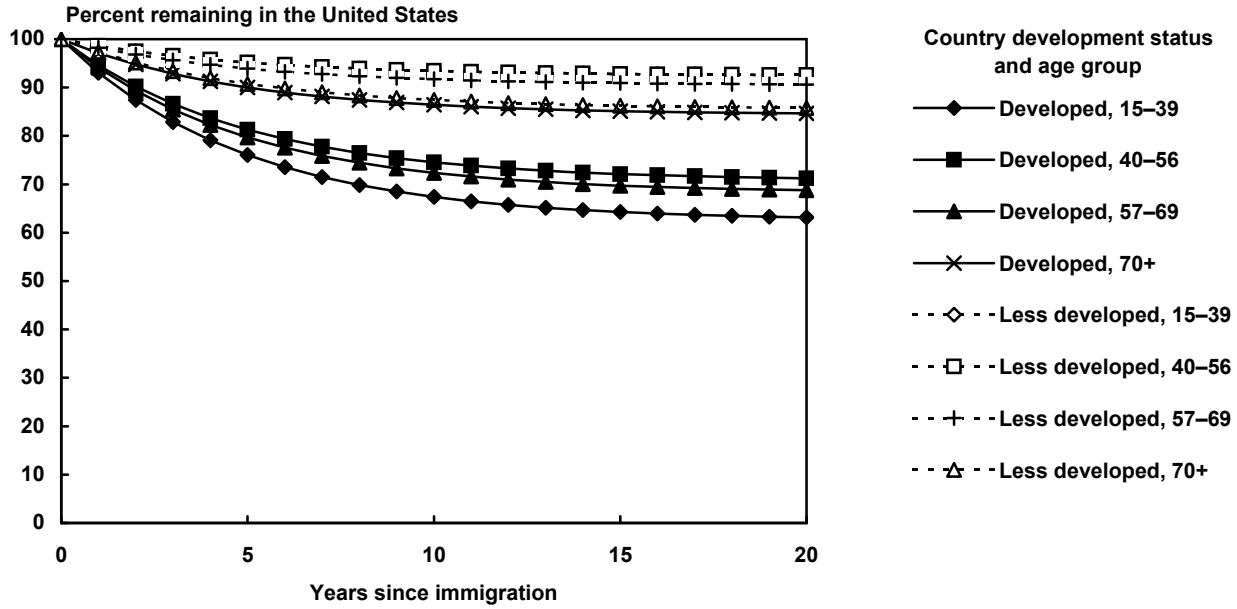
Furthermore, various pieces of empirical research, when tied together, suggest that about 87 percent of all emigration occurs within the first 10 years following immigration (Duleep 1994). Combining this information with the estimated 10-year emigration rates and the exponential decay model, estimates are generated of the percent of each age/sex/source-country cohort that emigrates for each year following immigration (Chart 1).[13]

These estimates can be applied to each year-of-immigration cohort of immigrants in the base sample of microsimulation models. From the base sample of immigrants in the model, emigrants can be chosen according to the probabilities of leaving, defined by sex, age, years in the United States, and country of origin (whether economically developed or not).[14]

Giving Undocumented Immigrants Earnings Profiles in Microsimulation Models

Although many data sources include to an unknown degree illegal immigrants, the discussion of projec-

Chart 1.
Immigrants remaining in the United States, by years since immigration, entry age group, and source-country development status



SOURCE: Authors' estimates are based on 1980 and 1990 Census of Population 5 percent and 1 percent public-use microdata samples.

tion methodology thus far has not explicitly treated illegal immigration. A challenge with incorporating the undocumented into microsimulation models is how to impute their earnings trajectories.

One approach would be to identify undocumented immigrants within the model's base population.[15] An imputation process originally developed at the Urban Institute by Jeff Passel and Rebecca Clark uses a two-part process to code survey respondents as undocumented aliens versus legal immigrants.[16]

Individuals are first identified as legal immigrants if they have characteristics that would make it very unlikely for them to be undocumented. For instance, individuals are classified as legal immigrants if they are in certain occupations that rarely are pursued by the undocumented, or if they receive benefits for which the undocumented are ineligible, or if they are veterans. Then, using the occupational structure of former illegal aliens who legalized under the Immigration Reform and Control Act of 1986 (IRCA), the percentage of aliens in each major occupation category in the Current Population Survey (CPS) that is undocumented is estimated.[17] Within each state/sex/occupation group, individuals are then randomly assigned to be undocumented or legal aliens, in line with the estimates of what percent in each of these cells should be undocumented. Equipped with these imputations, the earnings information of the assigned illegal aliens could be used to project the earnings trajectories of undocumented immigrants.

A potential problem with this approach is that the undocumented who are in national surveys such as the CPS may not represent most undocumented individuals. In particular, to the extent that undocumented people in the CPS and other national surveys are more permanent than those who are not in these surveys, their earnings patterns will be different as well. It seems unlikely that national surveys would "capture" undocumented immigrants who transit back and forth between the United Sates and their home country, which, for many, is Mexico. The intermittent U.S. attachment of these individuals makes it difficult to follow them through the Social Security record system or with any longitudinal survey data. Learning about the U.S. earnings profiles of these individuals requires an entirely different approach.

Moreover, assignment of illegal status in the Clark/Passel method is random. This is not a problem when projecting the numbers of illegal immigrants who, for instance, live in a particular region of the United States. It is however, a problem if the earnings profiles of the tagged individuals are used to represent the earnings profiles of illegal aliens. The earnings patterns of some of the respondents who are tagged

undocumented will in fact be legal immigrants. Yet, we would anticipate very different earnings profiles for legal immigrants versus the undocumented, particularly undocumented people who transit back and forth and do not intend to stay in the United States permanently.

The imputation approach also fails to recognize that within the undocumented immigrant population there are two types of immigrants—those who transit back and forth from their country of origin and those who plan to stay. Because the "stayers" will be more likely to invest in human capital than the transient, their earnings profiles will be characterized by lower initial earnings but higher earnings growth than the earnings profiles of the more transient population. A more sophisticated approach would also recognize a transition for some of the undocumented immigrants from being transient to more permanent. The earnings profiles of those who become legal or plan to become legal will differ from the earnings profiles of the undocumented who traverse back and forth. An alternative strategy would be to estimate the percent of the undocumented who are transient versus stayers and then impute earnings trajectories according to research that focuses specifically on those two "types" of undocumented immigrants.[18]

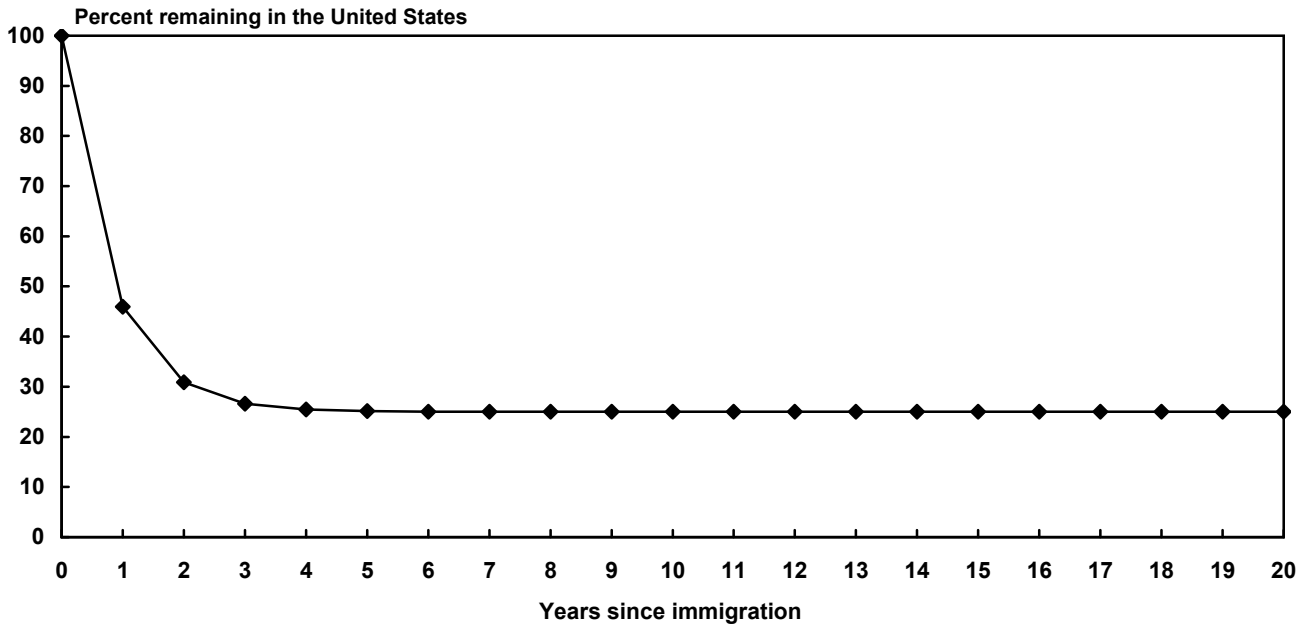
The Mexican Migration Project (MMP) is designed to capture the experiences of the more elusive group, those who transit back and forth. Created in 1982, the MMP attempts to garner social as well as economic information on Mexican-U.S. migration. Employing comprehensive intensive studies of Mexican communities, data are gathered in the winter months, when many migrants return home to join their families. Out-migrant samples are also taken, matching communities with migrants residing in the United States. The collected data have been compiled in a comprehensive database that has formed the foundation of numerous studies such as Massey (1987), Massey and Singer (1995), Orrenius and Zavodny (2001), Phillips and Massey (1999), Singer and Massey (1998), Donato and Massey (1992), and White, Bean, and Espenshade (1990).

The second "type" of undocumented immigrant falls between the permanent visa holders documented in the Office of Immigration Statistics (OIS) of the Department of Homeland Security (formerly known as the Immigration and Naturalization Service) and the temporary sojourners described in the Mexican Migration Project. They are illegal entrants (either by virtue of entering the United States illegally or by overstaying their visa) who end up staying permanently. Some insight about these foreign-born individuals comes from the Legalized Population Surveys (LPS) of 1989 and 1992. Under the Immigrant Reform and Control Act of 1986, 3 million previously unauthorized foreign-born individuals residing in the United States were legalized. The IRCA amnesty restrictions applied only to persons who exhibited some measure of U.S. permanence. Beginning in 1987, those who had resided continuously in the United States since January of 1982 could apply for permanent resident status under the amnesty provisions of IRCA. The Legalized Population Surveys of 1989 and 1992 are longitudinal data that follow formerly illegal immigrants who were legalized under the 1986 Immigrant Reform and Control Act. Studies that have employed these data include Cobb-Clark and Kossoudji (1999), Kossoudji and Cobb-Clark (2000, 2002), Powers and Seltzer (1998), Powers, Seltzer, and Shi (1998), and Rivera-Batiz (1999).

In deciding how to represent the earnings trajectories of the undocumented, modelers need to think about whether both types of illegal aliens are relevant to the issues they are pursuing. It may be that only the transient type or the stayer type are relevant for their purposes. What currently matters for Social Security purposes is not an accurate representation of the earnings trajectories of the undocumented, or even how many undocumented enter the United States each year, but rather an accurate representation of the Social Security earnings contributions from the undocumented sector. For this purpose, Social Security's Earnings Suspense File, adjusted for employer reporting error or individuals' name changes, might be the best source of information. On the other hand, if one wants to estimate the effect on the Social Security system of legalizing the undocumented, then an accurate representation of the earnings trajectories of the undocumented is important, keeping in mind that by affecting employment opportunities and permanence, legalization would affect the earning trajectories of those who were legalized.

As with the legal population, the emigration behavior of the undocumented population would need to be incorporated into the model. The evidence to date suggests an emigration pattern that is distinct from that of the legal population. Based on an analysis of the 1995 CPS, Passel (1999) finds that only 25 percent of the undocumented immigrant population had been in the United States for 10 years. Representing the emigration of the undocumented population with the

Chart 2.
Undocumented immigrants remaining in the United States, by years since immigration



SOURCE: Authors' emigration function imposed on estimates from Passel (1999).

exponential decay function introduced in the preceding section and imposing Passel's estimate that 75 percent of any given cohort of undocumented immigrants emigrate before 10 years yields a much higher emigration for the undocumented population than the documented, and a much steeper decline in the probability of emigrating with time spent in the United States (Chart 2).

Before deciding how to represent the undocumented immigrant population in a microsimulation model, modelers should carefully consider whether the issues being addressed require the inclusion of the undocumented at all. The youthfulness of the undocumented (described in the next article) and their generally short U.S. stays may make their inclusion irrelevant for some of the policy issues microsimulation models address.

A Concluding Word about the Choice of Predictor Variables

An important advance since microsimulation was conceived and the first model built (Orcutt 1957; Orcutt, Greenberg, Korbel, and Rivlin 1961) is the creation and use of longitudinal earnings data for research. This made possible the development of the less restrictive donor and past-is-prologue approaches for projecting individual earnings in microsimulation models. Yet, surveys that follow individuals or surveys matched to longitudinal administrative data are typically small. Because immigrants are a subsample of the population, sample size will often dictate a parsimonious choice of variables for projecting immigrant earnings trajectories in microsimulation models.

Ideally, an ongoing process would be established that would predict contributions to and benefits from the Social Security system for the immigrant population based on immigrant characteristics that capture distinctive features of immigrant earnings trajectories. Data on the predictor variables should be readily available on a continual basis so that projections can be updated annually.

Age at migration, sex, source-country level of economic development, and entry-level education determine distinct immigrant earnings trajectories. Other variables such as entry-level English language proficiency could be considered also. However, as described in the article preceding this one (Duleep and Dowhan 2008), there are complex interactions that modelers would then need to consider to insure a robust projection of immigrant earnings trajectories.

Building on research that links the characteristics of immigrants measured during their initial years in the United States to subsequent earnings growth, this article has emphasized the use of entry-level charac-

teristics (for example, entry-level education) to predict immigrant earnings trajectories. The reason for this emphasis is twofold. One, it obviates what would otherwise be a need to model human capital investment processes.[19] Two, an approach that relies on entry-level predictors lends itself to projections of future immigration—the topic of the next and final article in this series.

Notes

[1] Refer to U.S. Immigration and Naturalization Service (1996, 2001). INS statistics on permanent visas show particularly dramatic increases in immigration in the 1980s. However, a large component of this increase represents newly legalized immigrants under the Immigration Reform and Control Act of 1986, as well as increases in adjustments from temporary to permanent visa status.

[2] Immigrants entering the United States between 1900–1910 totaled 8.8 million, representing nearly 12 percent of the total U.S. population in 1900 (U.S. Immigration and Naturalization Statistics 1990, p. 22). The 1990 *INS Statistical Yearbook* presents an interesting synopsis of historical immigration trends. Also, see Reimers (1996). Note that the INS is now called the Office of Immigration Statistics, Department of Homeland Security.

[3] An exception to this generalization is that a different labor force participation rate is assumed for undocumented immigrants than for the general population.

[4] The seminal publications that introduced microsimulation are Orcutt (1957, 1960). Other publications that present this modeling methodology include Orcutt, Caldwell, and Wertheimer (1976), and Citro and Hanushek (1991).

[5] These results hold controlling for past health problems that could affect the level of income being related to mortality (Duleep 1986a, 1986c).

[6] For an illustration of the aggregation problem applied to the income-mortality relationship, refer to Duleep (1986b, 1986c).

[7] Although the discussion presents these methods separately, modelers often use various combinations of them.

[8] Because cohorts that vary in their entry-level earnings will also systematically vary in their earnings growth, the popular approach of controlling for cohort effects by including a dummy variable for each cohort in analyses that pool more than one cross-section is invalid: Earnings growth will be overestimated for cohorts starting at relatively high levels and underestimated for cohorts starting at relatively low levels. Predictions of immigrant earnings growth must either directly take into account the inverse relationship between entry earnings and earnings growth or include variables such as immigrant admission criteria, that may capture the effect of cohort characteristics on entry earnings and earnings growth, and allow the interaction between the added variables and the entry earnings and earnings growth (Duleep and Regets 1992, 1996a, 1996b). If modelers require information that summarizes the experiences of multiple year-of-entry cohorts, they can do this by averaging the estimates or modeling the relationship between entry earnings and earnings growth.

[9] In the Social Security application, an iterative earnings splicing procedure was pursued instead of using the entire completed earnings record of a single donor: Successive imputations in 5-year time segments were used to forecast earnings until retirement. Different donors, from different older cohorts, provided the earnings information that was successively spliced to the end of each incomplete earnings record. After each 5-year imputation, another donor is chosen. The iterative splicing process continues until the worker reaches age 67 or is predicted to die.

[10] In doing this sensitivity test, modelers should remember to use only post-1980 immigrants as donors for recent immigrants. If pre-1980 immigrant cohorts supply the donors, then "the test" will spuriously suggest no difference between using immigrants versus natives as donors; this would be because the earnings patterns of pre-1980 immigrants resembled the earnings patterns of U.S. natives. It could still be the case that using post-1980 immigrant cohorts as opposed to natives would make a difference.

[11] The mortality data are from the Public Health Service (2001, Table 2. Life table for males, United States, and Table 3. Life table for females, United States). Refer to Ahmed and Robinson (1994) for a more sophisticated example of a census-based estimation of emigration.

[12] Refer to Abraido-Lanza and others (1999); Fang, Madhavan, and Alderman (1997); Hummer and others (2000); Leclere (1997); Pandey and others (2001); Rogers and others (1996); Sorlie and others (1993); and Stellman and Wang (1994).

[13] We ignore complexities that prior research hints at. For instance, we ignore spikes in emigration when eligibility for Social Security insurance occurs, and at retirement age (Duleep 1994).

[14] Proximity of the United States to the country of origin should also be considered, particularly the neighboring status of Canada and Mexico.

[15] Note that survey data matched by identifying characteristics to Social Security earnings data will more likely represent legal immigrants only.

[16] This imputation of legal status for immigrants was first introduced in Passel and Clark (1998). It has subsequently been updated and expanded in many applications. See, for instance, Clark and others (2000) and Passel, Van Hook, and Bean (2006).

[17] The Current Population Survey is a survey of approximately 50,000 households per month. It is used to calculate the monthly national unemployment rate and is one of the mainstays of demographic and labor market research. In

January 1994, the CPS regularly began to collect information on nativity that permits the identification of immigrants.

[18] Note that embedded in this approach could be a model of transformation from transient to stayer status for some undocumented immigrants.

[19] As shown in Duleep and Regets (1999), immigrants are more likely to invest in education than natives are, and this tendency persists at older ages.

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Incorporating Immigrant Flows into Microsimulation Models

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Summary

Building on the research on immigrant earnings reviewed in the first article of this series, "Research on Immigrant Earnings," the preceding article, "Adding Immigrants to Microsimulation Models," linked research results to various issues essential for incorporating immigrant earnings into microsimulation models. The discussions of that article were in terms of a closed system. That is, it examined a system in which immigrant earnings and emigration are forecast for a *given* population represented in the base sample in the microsimulation model. This article, the last in the series, addresses immigrant earnings projections for open systems—microsimulation models that include projections of future immigration. The article suggests a simple method to project future immigrants and their earnings. Including the future flow of immigrants in microsimulation models can dramatically affect the projected Social Security benefits of some groups.

Introduction

The preceding article, (Duleep and Dowhan 2008a), focused on forecasting immigrant earnings and emigration for a *given* population represented in the base sample of the microsimulation model. For many purposes, microsimulation models form a closed system, predicting for an existing population. Some issues, however, demand that the model permit new entrants into the system: people marry, babies come into the world, and new immigrants arrive.

Social Security's Modeling Income in the Near Term (MINT) model, for instance, originally projected for a population represented by data from the 1990–1993 Survey of Income and Program Participation (SIPP) and ignored any post-1993 population growth fueled by immigration. To assess the future well-being of the elderly, Social Security analysts decided that MINT needed to forecast the earnings and retirement income of future U.S. elderly populations, including immigrants who entered the United States after the SIPP surveys of MINT's base sample. Moreover, if microsimulation were to supplement the actuarial forecasts of Social Security's financial status, future immigration would need to be projected.

Incorporating new immigrants into a microsimulation model poses two challenges—the flow of immigrants into the country needs to be projected and the new entrants' earnings profiles imputed. These pursuits are closely related since the characteristics that modelers include in the immigrant projections define what can be done in the immigrant earnings projections.

Projecting the Flow of Immigrants

In the sections that follow, two approaches for projecting immigrant flows are discussed: a time-series approach, where recent trends are used to forecast future trends, and a structural approach involving three steps: (1) determining the variables that affect immigration, (2) estimating the relationships between the predictor variables and immigration, and (3) projecting the predictor variables and their corresponding estimated immigration effects into the future. Combining elements of the time series and structural approaches, a new approach for projecting immigrant flows is introduced.

Using Recent Trends to Forecast Future Trends

U.S. immigration policy, the political state of the world, and various characteristics of the United States and other countries' economies affect the flow of immigrants to the United States. All of those factors are difficult (perhaps impossible) to project. Lacking a crystal ball to forecast their future fate, a pragmatic alternative is to use recent trends in U.S. immigration to forecast future trends. Recent immigration conveys a great deal of information about future immigration because once individuals begin to migrate to the United States from a particular region of the world, U.S. networks and paths are established and the process tends to continue.[1]

Although once established, migration patterns tend to persist, changes in immigration policy as well as changing circumstances in both the United States and in immigrant source countries occur and can affect both the magnitude and composition of immigration. For this reason, data that are continuously updated are needed to quickly capture changes in immigrant flows and incorporate them into the projections. At the same time, transitory influences, such as backlogs in the administration of immigrant visas, occur for a variety of reasons and may affect immigration for a particular year with no long-term implications. To parse out the persistent from the transitory requires data that can be averaged over several years. Annual data that is continuously updated would allow tracking changes in trends as well as averaging over several years.

Projections of the number of immigrants, by year of immigration, should also be done by characteristics that are associated with distinct immigrant earnings patterns. This way, projections of immigrants' earnings can be linked to the projected immigration. As discussed in the first article of this series, Duleep and Dowhan (2008b), human capital (often measured by age and years of schooling) affects the earnings of immigrants and U.S. natives. However, for immigrants, the degree to which their country-of-origin human capital transfers to the U.S. labor market also affects their earnings.

If the human capital that immigrants possess transfers easily to the U.S. labor market, immigrant earnings profiles resemble those of similarly educated and experienced U.S. natives. The less home-country skills transfer to the U.S. labor market, the lower the initial earnings of immigrants (relative to otherwise similar U.S. natives), but the higher their earnings growth, a phenomenon that likely reflects a higher propensity to invest in U.S. human capital. A key predictor of immigrant skill transferability is the source country's level of economic development. These arguments suggest that the ideal data for projecting immigration would classify immigrants by source country; the source country data could in turn be linked to annually updated data on the economic development of countries of the world.[2]

Some policy issues are relevant to legally admitted immigrants. Others relate to undocumented immigrants, still others relate to all immigrants. The ideal data source should permit separating the legal from the illegal immigrant population. Modelers could then tailor simulations to their own particular needs. Currently, little is known about illegal immigrants.

The aforementioned requirements—continuously updated historical records of U.S. immigration by legal status and country of origin—recommend using the annual records of the Office of Immigration Statistics (OIS) of the Department of Homeland Security (formerly known as the Immigration and Naturalization Service) as the primary data source for projecting future trends in immigration. These records contain the numbers and characteristics (age and gender) of all newly admitted legal immigrants by country of origin for each year.

Alternative data collected annually, such as the American Community Survey (ACS) files or the Current Population Survey (CPS) all contain, to an unknown degree, undocumented immigrants. In contrast, the OIS information, by its very nature, pertains solely to the legal population.[3] Modelers can separately add information on the undocumented in accordance with the latest research on undocumented immigrants available at the time of the projections.

The OIS annual data allow modelers to track trends and to average over several years. A straightforward approach for projecting future immigration would be to average immigration over recent years, dividing by source-region categories that are relevant to projecting immigrant earnings. Since the OIS data represent all immigrant source countries, modelers face no constraints in tailoring OIS-based projections to the source-country grouping used in their particular immigrant earnings projection model.

In using recent trends to project future trends, it is important to bear in mind significant policy changes that may have temporary effects. For instance, the Immigrant Reform and Control Act (IRCA) of 1986, provided for the legalization of 3.0 million residential undocumented immigrants.[4] In choosing past years to average and project future years, modelers might want to pick years beyond IRCA's initial effect. Recent research by Beach, Green, and Worswick (2008) shows an association between the host country's economic conditions and the numbers and age composition of immigrants. In years with exceptionally good economic conditions, a greater percent of immigrants are young. Their research suggests that to project future immigration, modelers may want to exclude from the averaging period years of exceptionally good or exceptionally poor economic conditions.[5]

Barring changes that temporarily increase or decrease immigration, averages over the most recent 5 years for which data are available might be used to forecast the near future. The fact that the OIS data are easily accessible and continuously updated means that the straightforward immigrant projection system described here could be easily updated, ad infinitum. As OIS data are updated, the multiyear averaging period would be similarly updated. To facilitate linking immigration projections to earnings projections, the immigration by source-country projections should be linked to data on economic development indicators.[6]

The easiest way to proceed is to use the OIS published tables associated with the statistical yearbook. These tables are available on the internet and provide, in one place, yearly trends in the number of immigrants by country of origin.

A shortcoming of these easy-to-use tabulations is that they do not have the age distributions of immigrants for all source countries or regions. One possibility would be to impose the overall age distribution of immigrants, which is available each year in the OIS published tables, on each source country/region used in the projections. This approach would be acceptable *if* immigrant age distributions across countries of origin were similar, or at least uncorrelated with source-country factors that affect earnings profiles, in particular, the economic development level of the source country.

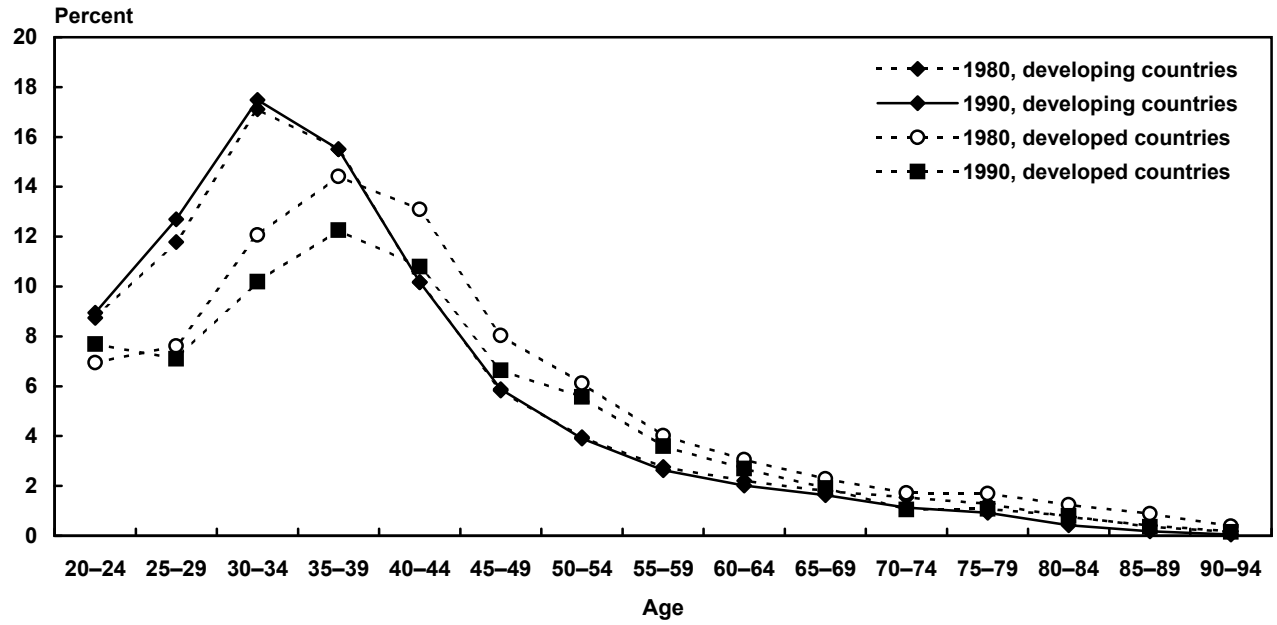
To gauge the importance of intercountry variations in immigrant age distributions we used public-use microsample data from the 1980 and 1990 censuses to estimate the age distribution of immigrants, divided by country of origin (Chart 1).[7] In general, young adults are more heavily represented in economically developing countries versus economically developed countries.

The OIS provides access to individual records of legal immigrant admissions through public-use tapes that are available annually. From these data records, the age/gender distribution for each source country/region could be calculated. The analysis of immigrant age distributions by source country suggests that for the proposed immigration projection system, a system should be established to inform Social Security immigrant projections with OIS data on individuals.

Another issue with using the OIS records as the primary data source for projecting future immigration trends is that the records lack information on the education of immigrants. Yet, as with age, immigrant education distributions vary by country of origin (Funkhouser and Trejo 1995).[8]

Remedying the education deficit requires supplementing the OIS data with survey data.[9] The sample sizes for immigrants in several annual surveys with education information, such as the CPS, are small. Due solely to sampling variability, large year-to-year variations in the immigrant education levels by source country occur in these surveys. One possible strategy for overcoming the sample size constraint would be to use information on incoming immigrants averaged over several consecutive surveys. Another possibility would be to rely on decennial census data to fill in the missing information in the OIS-based projections. A shortcoming of the decennial census data, however, is their infrequency. The best option, in terms of both sample size and frequency, is the recently instituted annual American Community Survey (ACS) data. Whatever the data source, the modeler would want to proceed by using the survey data to measure education for the country-of-origin/gender/age groups detailed by the OIS data since the distribution of immigrant education by source country varies with the age and gender of immigrants.[10]

Chart 1.
Distribution of immigrants by age at time of entry and source-country category (economically developing versus developed countries), based on the 1980 and 1990 Census PUMS (percent)



SOURCE: Authors estimates based on 1980 and 1990 Census PUMS.

NOTE: PUMS = public-use microdata sample.

Beacons of Immigration Change

The projection methodology thus far is a time series approach—current and past immigration predicts future immigration. Another approach for projecting immigration is a structural one. Variables that affect immigration are determined through research. Having determined the relevant variable set, the relationship between these predictors of immigration and immigration is estimated. The predictors of immigration are then projected into the future, along with the corresponding estimated immigration responses.

The difficulty with the structural approach lies not with estimating the relationship between the predictor variables and immigration, which can be done using historical and cross-sectional data, but with the inherent difficulty of projecting the future path of the predictor variables. The limitation of the time-series approach is that the view of the future is limited to what the present and recent past encapsulate.

A middle-ground strategy would be to combine elements of both the time-series and structural approaches. Specifically, assume that recent immigration generally predicts future immigration, but supplement the time-series predicted paths with "beacons of change." This could be done by using annual data to track key predictors of immigration. When a clear change in one of the predictor variables becomes apparent, the time-series based immigration projections would change according to the estimated "structural" relationships between the predictor variables and immigration.

The key variables to track would be those that research, conducted over many time periods and across countries, has shown to have a clear effect on immigration. One such variable is immigration policy. Given that a policy change is expected to be lasting, the country-specific immigration trajectories would change according to the estimated effect of the policy change on immigration.

The age composition of each source country is another key variable to track. Theoretically, the younger migrants are, the longer the payoff time from migration; opportunity costs also increase with age—as one works in a particular locality and firm, it becomes increasingly difficult to transfer the accumulated work experience. Empirically, a large body of research shows that most adult immigrants are young.[11] A country's age distribution thus determines the population of *potential* immigrants. When a significant

change in a country's age distribution is detected, the projected trajectory of that country's U.S. immigration would be altered to reflect this change.[12]

A third key variable is a country's level of economic development. Substantial research documents the following characteristics of the relationship between economic development and migration.[13]

- At the very lowest levels of economic development, people do not migrate—it is not the poorest of the poor who migrate.
- When a certain economic threshold is passed, migration from poor to rich regions begins. Once started, the migration persists, fueled by the networks and paths established by earlier migrants.
- Migration decreases as the source-country/destination-country differential in economic development narrows.

As discussed in the preceding article (Duleep and Dowhan 2008a), source-country economic development also affects immigrant emigration from the United States.

In this proposed projection system, the economic development of all countries, relative to the United States would be tracked. In supplementing the times-series projection approach, the most important countries to track would be those that are currently big contributors to U.S. immigration as well as those countries that are not big contributors, but potentially could be. For countries that are currently big U.S. immigration contributors, the relevant question is whether the situation will change. A large upswing in their economic development relative to the United States would signify such a change in both their immigration and U.S. emigration trajectories. For countries that are potential contributors, passing a certain economic-development threshold could signify the beginning of an important flow of immigration.

In determining when a clear change in one of the predictor variables has occurred, modelers would need to set up a system to identify persistent stable changes in one direction. For instance, a positive increase in a country's gross national product (GNP) over a 5-year period might be a satisfactory indicator of a persistent stable change.

To use this proposed projection system requires predicting changes in immigration trajectories as a function of changes in the tracked predictor variables. One approach would be to use estimates (based on cross-sectional and time-series data) of the relationship between changes in policy, economic development, age structure, and changes in immigration. Another approach would be to mimic the MINT methodology approach (described in Duleep and Dowhan 2008a), wherein the earnings trajectories of older persons are used to project the earnings trajectories of younger persons. In like fashion, the experiences of similar countries—that went through a similar transition in the recent past—could serve as donors for a country's projected immigration trajectory.

By utilizing the knowledge that is in the recent landscape of U.S. immigration by source country, the proposed projection approach acknowledges the inertia that is inherent to immigration flows. Yet it also permits updating those predictions in response to changes in three key variables (immigration policy, age structure, and economic development) that are easily tracked annually. A key assumption underlying this approach is that recent immigration is a good predictor of future immigration until there is a significant change in one of the key predictor variables. On the road to projecting immigration, this system might be called "The Past is Prologue" with acknowledged important bumps.

Giving the New Immigrants Earnings Profiles

Armed with trends in the number of immigrants by earnings relevant characteristics, the microsimulation modeler is now poised to bring these projected immigrants to life by giving them earnings profiles. As discussed in the preceding article (Duleep and Dowhan 2008a), there are three general methods used to forecast individual earnings in microsimulation models: the "human capital" approach, the "past-is-prologue" approach, and the "donor" approach.

Without any earnings information, it is impossible to project earnings profiles for future immigrants with the past-is-prologue approach. Nor can earnings be projected with the method introduced in the preceding article (Duleep and Dowhan 2008a) that uses the distance between immigrants' initial earnings and the earnings of similarly experienced and educated natives to predict immigrant earnings growth.

It is possible to estimate earnings as a function of the projected characteristics, and simulate an earnings profile for each age-gender-education-country of origin combination. However, as discussed in the preceding article, a possible limitation of a parametric approach is the limited variation in earnings profiles across the

projected individuals.[14] An alternative approach to project the earnings of future immigrants is to choose donors from the model's base population and clone their earnings profiles on the new immigrants.[15]

The lessons learned from research on immigrant earnings in the first article (Duleep and Dowhan 2008b), should inform the donor selection process. Since immigrants and U.S. natives have distinctly different earnings profiles, *even controlling for age and education*, immigrants, not natives, should serve as donors for the model's new immigrants. The profound change over time in immigrant earnings profiles suggests that donors be chosen from the subsample of immigrants in the base population who came to the United States after 1979. Important earnings profile differences across immigrants associated with the economic development of their home countries suggests that source-country divisions that capture these differences should be used to select donors. Finally, immigrant earnings profiles vary according to the age at which immigrants enter the United States. Sample size constraints may prohibit picking donors from a model's base population of post-1979 immigrants within detailed age-at-migration categories. In this case, a sensible approach would be to aggregate age-at-migration categories into three categories: migrated at young working ages (for example, ages 20–39); migrated at older working ages (for example, ages 40–59); and migrated at near retirement and retirement ages (for example, ages 60 or older).

In summary, to bring the projected immigrants to life, microsimulation modelers can pick donors by first stratifying the base sample of immigrants who immigrated after 1979 by gender, age at migration, and source region. Donors for the new immigrants can then be chosen in accordance with the projected numbers of future immigrants and their earnings cloned onto the new immigrants. Using the same stratification scheme, modelers can also choose emigrants from the population of new (donor-created) immigrants, in accordance with the emigration methodology used in the preceding article (Duleep and Dowhan 2008a).

The proposed projection methodology for incorporating future immigrant flows into microsimulation models reflects recent immigration trends and takes into account earnings pattern variations among immigrants and between immigrants and natives. It also takes into account immigrant emigration. Key among its advantages is that it can be easily updated on a continuous basis using readily available data.

Projecting Undocumented Immigrants

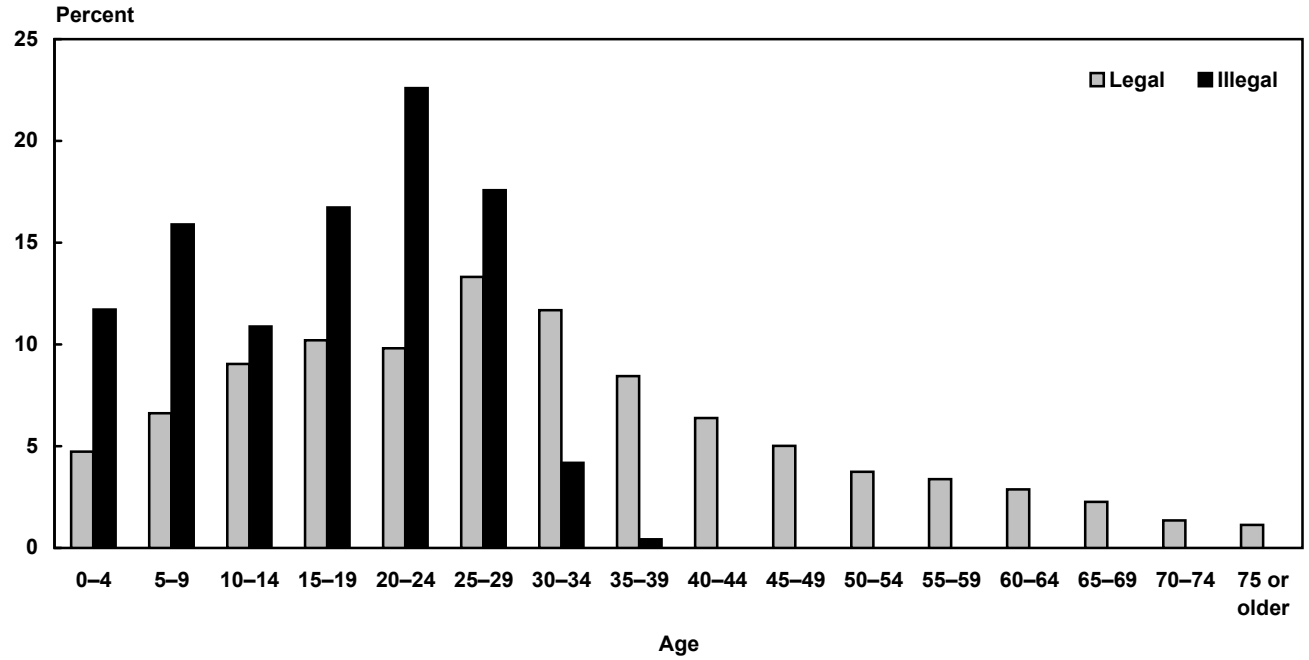
The discussion of projection methodology thus far has not explicitly treated illegal immigration. Although many data sources include illegal immigrants to an unknown degree, information on the undocumented per se is scarce. Much of it comes from nonstatistical studies. These studies strongly suggest that the undocumented differ from legal immigrants in terms of their age, source-country composition, and emigration. Yet it is difficult to derive from such approaches numbers to use for a model's projections.

A statistical approach called the "residual method" can be used to inform estimates of the undocumented immigrant population.[16] Starting with the number of immigrants in a survey such as the Decennial Census or CPS, the residual method estimates immigrant population growth as if the only source of growth was the immigration of legal immigrants, as accurately counted by the OIS annual records. Taking into account the (estimated) extent to which the Census or CPS undercounts immigrants, the number of immigrants in a later survey minus the estimated legal immigration growth provides an estimate of the undocumented immigrant population. Based on the residual method, Passel (1999) estimated that about 520,000 illegal immigrants enter the United States each year.

The residual method also provides information on some of the likely characteristics of the undocumented immigrant population. The age distribution of the undocumented differs radically from that of the legal immigrant population: The undocumented are younger (Chart 2). They are also far more likely to come from Central America, particularly Mexico, than are legal immigrants (Chart 3). To capture these differences in a microsimulation model, the age and source-country distribution shown in Charts 2 and 3 could be imposed on the illegal immigrants estimated to enter the country each year.

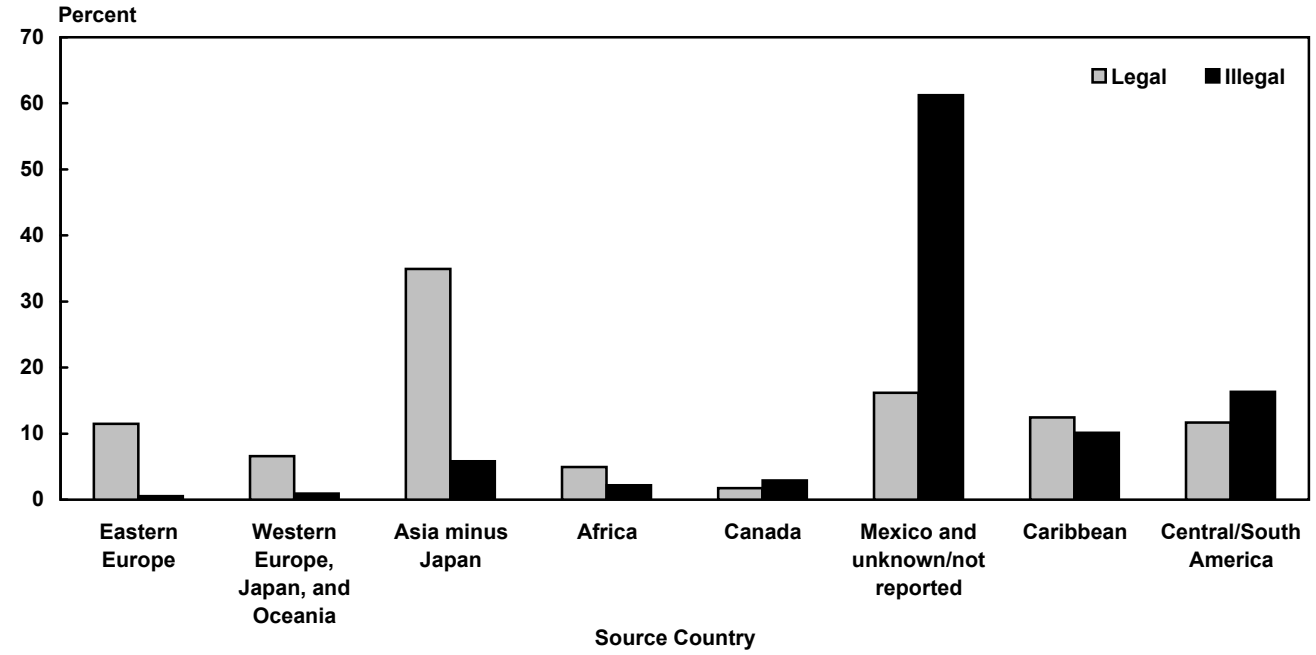
A pragmatic approach for projecting future trends of the undocumented is to use recent past trends to forecast future trends. As with immigrants in general, the recent past is informative since once the undocumented begin to migrate to the United States from a particular region of the world, U.S. networks are established and the process tends to continue. Yet, unlike legal immigration, no administrative record source exists that explicitly counts the undocumented entering the United States each year.

Chart 2.
Distribution of legal versus illegal immigrants, by age at time of entry (percent)



SOURCE: Information on the age distribution for legal immigrants is from the Immigration and Naturalization Service records for 1993-1998. The age distribution estimates for illegal (undocumented) immigrants are based on Passel (1999).

Chart 3.
Distribution of legal versus illegal immigrants, by source country (percent)



SOURCE: Information on the source-country distribution for legal immigrants is from the Immigration and Naturalization Service records for 1993-1998. The source-country distribution estimates for illegal (undocumented) immigrants are based on Passel (1999).

A time series of annual "counts" of the undocumented, by region of origin and age, could be created and annually updated using the residual method with annual data such as the CPS or ACS. With such a continually updated time series of estimated counts, projections of future undocumented immigration based on recent average experience, could be made. With regard to "beacons of change," the key variables that affect legal immigration—source countries' level of economic development, their age structure, and U.S. immigration policy—also affect undocumented immigration and could be incorporated into the projection methodology.

Adding Future Immigrants Can Affect Policy Predictions

Including future flows of immigrants can dramatically affect policy predictions from microsimulation models. For instance, Social Security's MINT model simulates the economic welfare of the future aged population. Using some of the projection methods outlined in this article, immigration was incorporated into the MINT model. Doing so increased both the size of the projected population and its composition. With the closed MINT model, 10.7 percent of retirees in 2020 are projected to be foreign born. With the addition of new immigrants, the share of foreign-born retirees increased to 14.4 percent. The closed MINT system projected that 7.9 percent of the elderly population in 2020 would be Hispanic. That share increased to 9.3 percent with new immigrants added to the model.

Including future immigrant flows to the MINT model also affected the projected Social Security benefits of groups. Social Security benefits are typically computed using the average indexed monthly earnings (AIME). The average summarizes up to 35 years of a worker's earnings. From the AIME, the primary insurance amount (PIA) is computed. The PIA is the basis for benefits that are to be paid.

Adding new immigrants decreased the population mean AIME in 2020, from 78 percent to 75 percent of the economy-wide average wage. Though modest, the significance of this change increases when particular groups are considered. The mean AIME of Hispanics and Asians fell by 17 percent and 25 percent, respectively. Prior to the addition of new immigrants, only 4.3 percent of men born between 1961 and 1965 were projected to be ineligible for Social Security's Old-Age insurance. With their inclusion, this percentage increased to 10.3 percent. These examples underscore the potential importance of including future immigrants in microsimulation models.

Notes

[1] Many scholars have documented the role persistence plays in migration patterns via family relationships, networks, and paths blazed by prior migrants. See, for instance, Bauer, Epstein, and Gang (2002), Boyd (1989), Epstein and Gang (2004), Gurak and Caces (1992), and Jasso and Rosenzweig (1986).

[2] There are two potential sources of data that could be used for this purpose: the World Development Indicators database, published by the World Bank, which has more than 550 development indicators with time series for over 200 countries or country groups from 1960 to the present (World Bank 2005), and the Penn World Tables (Heston, Summer, and Aten 2002; Heston and Summers 1991).

[3] The National Immigration Survey pertains solely to documented immigration, but is not available on an annual basis.

[4] Beginning in 1987, those who had resided continuously in the United States since January 1982 could apply for permanent resident status under the amnesty provisions of IRCA. Under those provisions, 1.7 million applied for amnesty, and another 1.3 million applied as Specialized Agricultural Workers, a program that was much more lenient (only 90 days of continuous agricultural employment in the past year) in requirements for legalization.

[5] An alternative approach would be to model the effect of economic conditions on immigration, or to use the estimates from Beach, Green, and Worswick (2008) to inform the projections. The problem with this approach is that it assumes that future economic conditions can be reasonably predicted.

[6] Refer to note 2 for information on two potential sources of data that could be used for this purpose.

[7] Chart 2 gives statistics for men and women combined; separate analyses by gender relate the same story.

[8] By picking donors to represent new immigrants by country of origin (discussed in the next section), the educational distribution of immigrants *will* be represented. The adequacy of this approach will depend on the size of the base sample from which the donors are chosen. A disadvantage of this approach, regardless of the base sample's size, is that it does not allow updating the education distribution of immigrants by country of origin, but rather freezes it at what is represented in the models' base sample data.

[9] Another approach, described in note 8, could also be pursued.

[10] A problem with using ACS, CPS, or Census data to fill in the missing education information in the projections is that these data sources include to an unknown extent illegal aliens. Comparing the education information by source country from these sources with the information collected

in the New Immigrant Survey (Jasso, Massey, Rosenzweig, and Smith 2000), a survey that follows one cohort of legal immigrants, would help gauge how the inclusion of illegal aliens affects the education results.

[11] The age pattern of migration is well documented. See, for instance, U.S. Census Bureau (1996) and Fertig and Schmidt (2000).

[12] Each country's age distribution could be tracked using the Census Bureau's International Data Base, a computerized data bank containing statistical tables of demographic data for 228 countries and areas around the world.

[13] A few examples of research documenting this relationship include Hatton and Williamson (1992, 1994), Massey and Zenteno (1999), and Volger and Rotte (2000).

[14] Variation in earnings profiles across the projected individuals will be limited to the demographic/human capital divisions used in the earnings regressions.

[15] As discussed in Duleep and Dowhan 2008a, the donor approach to modeling earnings in microsimulation models will, by design, be the most successful in representing variation in immigrant earnings profiles because the donors that "donate" the projected earnings profile come from the existing population of immigrants and thereby represent the extant variation in earnings profiles within any demographic/human capital group.

[16] Another approach, principally associated with the work of Bob Warren of the former Immigration and Naturalization Service, constructs estimates of the undocumented immigrant population by combining detailed statistics by year of entry for each component of change that contributes to the undocumented immigrant population residing in the United States. Refer to Warren (1994, 1998).

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OASDI and SSI Snapshot and SSI Monthly Statistics

Each month, the Social Security Administration's Office of Retirement and Disability Policy posts key statistics about various aspects of the Supplemental Security Income (SSI) program at http://www.socialsecurity.gov/policy. The statistics include the number of people who receive benefits, eligibility category, and average monthly payment. This issue presents SSI data for June 2007—June 2008.

The Monthly Statistical Snapshot summarizes information about Social Security and the SSI programs and provides a summary table on the trust funds. Data for June 2008 are given on pages 78–79. The more detailed SSI tables begin on page 81. Persons wanting detailed monthly OASDI information should visit the Office of the Actuary's Web site at http://www.ssa.gov/OACT/ProgData/beniesQuery.html.

Monthly Statistical Snapshot

Table 1. Number of people receiving Social Security, Supplemental Security Income, or both
Table 2. Social Security benefits
Table 3. Supplemental Security Income recipients
Table 4. Operations of the Old-Age Survivors Insurance and Disability Insurance Trust Funds

The most current edition of Tables 1–3 will always be available at http://www.socialsecurity.gov/policy/docs/quickfacts/stat_snapshot. The most current data for the trust funds (Table 4) are available at http://www.socialsecurity.gov/OACT/ProgData/funds.html.

Monthly Statistical Snapshot, June 2008

Table 1.
Number of people receiving Social Security, Supplemental Security Income, or both, June 2008 (in thousands)

Type of beneficiary	Total	Social Security only	SSI only	Both Social Security and SSI
All beneficiaries	55,253	47,800	4,836	2,617
Aged 65 or older	36,391	34,367	869	1,155
Disabled, under age 65 [a]	11,880	6,450	3,967	1,462
Other [b]	6,982	6,982	. . .	. . .

SOURCE: Social Security Administration, Master Beneficiary Record, 100 percent data. Social Security Administration, Supplemental Security Record, 100 percent data.

NOTES: Data are for the end of the specified month. Only Social Security beneficiaries in current-payment status are included.

. . . = not applicable.

a. Includes children receiving SSI on the basis of their own disability.

b. Social Security beneficiaries who are neither aged nor disabled (for example, early retirees, young survivors).

CONTACT: Art Kahn (410) 965-0186 or ssi.monthly@ssa.gov for further information.

Table 2.
Social Security benefits, June 2008

Type of beneficiary	Beneficiaries		Total monthly benefits (millions of dollars)	Average monthly benefit (dollars)
	Number (thousands)	Percent		
All beneficiaries [a]	50,417	100.0	50,020	992.10
Old-Age Insurance				
Retired workers	31,965	63.4	34,666	1,084.50
Spouses	2,408	4.8	1,284	533.20
Children	509	1.0	275	540.80
Survivors Insurance				
Widow(er)s and parents [b]	4,410	8.7	4,523	1,025.50
Widowed mothers and fathers [c]	161	0.3	126	779.40
Children	1,899	3.8	1,343	707.30
Disability Insurance				
Disabled workers	7,229	14.3	7,260	1,004.20
Spouses	152	0.3	40	266.50
Children	1,683	3.3	504	299.30

SOURCE: Social Security Administration, Master Beneficiary Record, 100 percent data.

NOTES: Data are for the end of the specified month. Only beneficiaries in current-payment status are included.

Some Social Security beneficiaries are entitled to more than one type of benefit. In most cases, they are dually entitled to a worker benefit and a higher spouse or widow(er) benefit. If both benefits are financed from the same trust fund, the beneficiary is usually counted only once in the statistics, as a retired-worker or a disabled-worker beneficiary, and the benefit amount recorded is the larger amount associated with the auxiliary benefit. If the benefits are paid from different trust funds the beneficiary is counted twice, and the respective benefit amounts are recorded for each type of benefit.

a. Includes special age-72 beneficiaries.

b. Includes nondisabled widow(er)s aged 60 or older, disabled widow(er)s aged 50 or older, and dependent parents of deceased workers aged 62 or older.

c. A widow(er) or surviving divorced parent caring for the entitled child of a deceased worker who is under age 16 or is disabled.

CONTACT: Hazel P. Jenkins (410) 965-0164 or oasdi.monthly@ssa.gov for further information.

Table 3.
Supplemental Security Income recipients, June 2008

Age	Recipients		Total payments [a] (millions of dollars)	Average monthly payment [b] (dollars)
	Number (thousands)	Percent		
All recipients	7,453	100.0	3,841	477.00
Under 18	1,140	15.3	683	567.70
18–64	4,289	57.5	2,357	492.00
65 or older	2,024	27.2	801	394.10

SOURCE: Social Security Administration, Supplemental Security Record, 100 percent data.

NOTE: Data are for the end of the specified month.

a. Includes retroactive payments.

b. Excludes retroactive payments.

CONTACT: Art Kahn (410) 965-0186 or ssi.monthly@ssa.gov for further information.

Table 4.
Operations of the Old-Age and Survivors Insurance and Disability Insurance Trust Funds, March 2008 (in millions of dollars)

Component	OASI	DI	Combined OASI and DI
		Receipts	
Total	98,300	13,840	112,140
Net contributions	50,363	8,553	58,915
Income from taxation of benefits	12	0	13
Net interest	47,925	5,286	53,212
Payments from the general fund	0	0	0
		Expenditures	
Total	44,443	9,053	53,496
Benefit payments	40,551	8,336	48,887
Administrative expenses	317	272	589
Transfers to Railroad Retirement	3575	445	4020
		Assets	
At start of month	1,904,154	205,802	2,109,956
Net increase during month	53,857	4,787	58,644
At end of month	1,958,011	210,589	2,168,600

SOURCE: Data on the trust funds were accessed on May 9, 2007, on the Office of the Chief Actuary's Web site at http://www.socialsecurity.gov/OACT/ProgData/funds.html.

NOTE: Totals may not equal the sum of the components because of rounding.

Supplemental Security Income
June 2007–June 2008

SSI Federally Administered Payments

Table 1. Recipients (by type of payment), total payments, and average monthly payment
Table 2. Recipients, by eligibility category and age
Table 3. Recipients of federal payment only, by eligibility category and age
Table 4. Recipients of federal payment and state supplementation, by eligibility category and age
Table 5. Recipients of state supplementation only, by eligibility category and age
Table 6. Total payments, by eligibility category, age, and source of payment
Table 7. Average monthly payment, by eligibility category, age, and source of payment

Awards of SSI Federally Administered Payments

Table 8. All awards, by eligibility category and age of awardee

The SSI Monthly Statistics are also available at http://www.socialsecurity.gov/policy/docs/statcomps/ssi_monthly/index.html.

Table 1.
Recipients (by type of payment), total payments, and average monthly payment, June 2007–June 2008

Month	Number of recipients				Total payments [a] (thousands of dollars)	Average monthly payment [b] (dollars)
	Total	Federal payment only	Federal payment and state supplementation	State supplementation only		
2007						
June	7,314,027	5,025,486	1,992,529	296,012	3,625,876	467.70
July	7,346,122	5,048,420	2,000,801	296,901	3,665,925	466.70
August	7,335,942	5,039,337	1,999,139	297,466	3,645,801	466.70
September	7,355,596	5,053,437	2,004,028	298,131	3,647,862	467.10
October	7,383,815	5,074,012	2,011,161	298,642	3,713,167	465.80
November	7,350,382	5,048,638	2,002,851	298,893	3,586,332	467.60
December	7,359,525	5,057,395	2,003,839	298,291	3,735,792	468.40
2008						
January	7,386,859	5,078,577	2,011,353	296,929	3,742,315	475.70
February	7,382,806	5,076,113	2,010,168	296,525	3,741,089	476.40
March	7,399,632	5,089,646	2,013,465	296,521	3,769,599	476.90
April	7,428,073	5,111,396	2,019,671	297,006	3,845,076	476.40
May	7,408,267	5,096,218	2,014,736	297,313	3,777,113	477.70
June	7,453,089	5,129,012	2,025,843	298,234	3,841,233	477.00

SOURCE: Social Security Administration, Supplemental Security Record, 100 percent data.

NOTE: Data are for the end of the specified month.

a. Includes retroactive payments.

b. Excludes retroactive payments.

CONTACT: Art Kahn (410) 965-0186 or ssi.monthly@ssa.gov for further information.

Table 2.
Recipients, by eligibility category and age, June 2007–June 2008

Month	Total	Eligibility category		Age		
		Aged	Blind and disabled	Under 18	18–64	65 or older
2007						
June	7,314,027	1,208,766	6,105,261	1,102,812	4,200,005	2,011,210
July	7,346,122	1,210,261	6,135,861	1,112,881	4,217,655	2,015,586
August	7,335,942	1,209,640	6,126,302	1,106,044	4,213,591	2,016,307
September	7,355,596	1,210,708	6,144,888	1,115,317	4,220,609	2,019,670
October	7,383,815	1,212,151	6,171,664	1,119,468	4,240,142	2,024,205
November	7,350,382	1,210,582	6,139,800	1,109,414	4,218,103	2,022,865
December	7,359,525	1,204,512	6,155,013	1,121,017	4,221,920	2,016,588
2008						
January	7,386,859	1,207,249	6,179,610	1,121,830	4,241,747	2,023,282
February	7,382,806	1,205,049	6,177,757	1,120,026	4,241,558	2,021,222
March	7,399,632	1,204,243	6,195,389	1,126,322	4,251,217	2,022,093
April	7,428,073	1,204,559	6,223,514	1,132,149	4,271,980	2,023,944
May	7,408,267	1,201,557	6,206,710	1,124,418	4,263,373	2,020,476
June	7,453,089	1,202,416	6,250,673	1,140,154	4,289,159	2,023,776

SOURCE: Social Security Administration, Supplemental Security Record, 100 percent data.

NOTE: Data are for the end of the specified month.

CONTACT: Art Kahn (410) 965-0186 or ssi.monthly@ssa.gov for further information.

Table 3.
Recipients of federal payment only, by eligibility category and age, June 2007–June 2008

Month	Total	Eligibility category		Age		
		Aged	Blind and disabled	Under 18	18–64	65 or older
2007						
June	5,025,486	616,075	4,409,411	879,074	3,027,082	1,119,330
July	5,048,420	616,218	4,432,202	887,162	3,040,043	1,121,215
August	5,039,337	615,064	4,424,273	881,580	3,037,019	1,120,738
September	5,053,437	614,705	4,438,732	889,387	3,042,388	1,121,662
October	5,074,012	614,708	4,459,304	893,023	3,057,468	1,123,521
November	5,048,638	613,372	4,435,266	885,284	3,041,160	1,122,194
December	5,057,395	608,957	4,448,438	895,007	3,045,176	1,117,212
2008						
January	5,078,577	610,816	4,467,761	895,654	3,061,087	1,121,836
February	5,076,113	609,282	4,466,831	894,205	3,061,706	1,120,202
March	5,089,646	608,122	4,481,524	899,489	3,070,057	1,120,100
April	5,111,396	607,789	4,503,607	904,323	3,086,385	1,120,688
May	5,096,218	605,553	4,490,665	898,091	3,080,232	1,117,895
June	5,129,012	605,097	4,523,915	910,658	3,099,644	1,118,710

SOURCE: Social Security Administration, Supplemental Security Record, 100 percent data.

NOTE: Data are for the end of the specified month.

CONTACT: Art Kahn (410) 965-0186 or ssi.monthly@ssa.gov for further information.

Table 4.
Recipients of federal payment and state supplementation, by eligibility category and age, June 2007–June 2008

Month	Total	Eligibility category		Age		
		Aged	Blind and disabled	Under 18	18–64	65 or older
2007						
June	1,992,529	491,001	1,501,528	221,409	1,024,834	746,286
July	2,000,801	492,067	1,508,734	223,385	1,029,047	748,369
August	1,999,139	492,359	1,506,780	222,026	1,027,961	749,152
September	2,004,028	493,533	1,510,495	223,619	1,029,251	751,158
October	2,011,161	494,892	1,516,269	224,036	1,033,537	753,588
November	2,002,851	494,588	1,508,263	221,670	1,027,751	753,430
December	2,003,839	492,483	1,511,356	223,626	1,028,547	751,666
2008						
January	2,011,353	494,940	1,516,413	223,660	1,032,325	755,368
February	2,010,168	494,345	1,515,823	223,466	1,031,723	754,979
March	2,013,465	494,626	1,518,839	224,507	1,033,195	755,763
April	2,019,671	495,216	1,524,455	225,482	1,037,319	756,870
May	2,014,736	494,441	1,520,295	223,909	1,034,682	756,145
June	2,025,843	495,450	1,530,393	227,132	1,040,607	758,104

SOURCE: Social Security Administration, Supplemental Security Record, 100 percent data.

NOTE: Data are for the end of the specified month.

CONTACT: Art Kahn (410) 965-0186 or ssi.monthly@ssa.gov for further information.

Table 5.
Recipients of state supplementation only, by eligibility category and age, June 2007–June 2008

Month	Total	Eligibility category		Age		
		Aged	Blind and disabled	Under 18	18–64	65 or older
2007						
June	296,012	101,690	194,322	2,329	148,089	145,594
July	296,901	101,976	194,925	2,334	148,565	146,002
August	297,466	102,217	195,249	2,438	148,611	146,417
September	298,131	102,470	195,661	2,311	148,970	146,850
October	298,642	102,551	196,091	2,409	149,137	147,096
November	298,893	102,622	196,271	2,460	149,192	147,241
December	298,291	103,072	195,219	2,384	148,197	147,710
2008						
January	296,929	101,493	195,436	2,516	148,335	146,078
February	296,525	101,422	195,103	2,355	148,129	146,041
March	296,521	101,495	195,026	2,326	147,965	146,230
April	297,006	101,554	195,452	2,344	148,276	146,386
May	297,313	101,563	195,750	2,418	148,459	146,436
June	298,234	101,869	196,365	2,364	148,908	146,962

SOURCE: Social Security Administration, Supplemental Security Record, 100 percent data.

NOTE: Data are for the end of the specified month.

CONTACT: Art Kahn (410) 965-0186 or ssi.monthly@ssa.gov for further information.

Table 6.
Total payments, by eligibility category, age, and source of payment, June 2007–June 2008 (in thousands of dollars)

Month	Total	Eligibility category		Age		
		Aged	Blind and disabled	Under 18	18–64	65 or older
			All sources			
2007						
June	3,625,876	463,582	3,162,294	640,116	2,208,751	777,009
July	3,665,925	464,155	3,201,770	647,979	2,239,112	778,834
August	3,645,801	463,747	3,182,055	639,088	2,227,682	779,031
September	3,647,862	464,238	3,183,624	645,054	2,222,415	780,394
October	3,713,167	465,917	3,247,250	649,895	2,279,476	783,796
November	3,586,332	463,971	3,122,362	636,647	2,168,620	781,065
December	3,735,792	465,272	3,270,520	660,768	2,290,670	784,354
2008						
January	3,742,315	472,645	3,269,669	661,309	2,282,644	798,361
February	3,741,089	471,094	3,269,995	664,604	2,279,637	796,848
March	3,769,599	472,120	3,297,479	670,708	2,299,885	799,006
April	3,845,076	473,162	3,371,915	681,076	2,362,885	801,115
May	3,777,113	470,934	3,306,179	668,912	2,309,775	798,426
June	3,841,233	471,815	3,369,418	683,340	2,357,134	800,758
			Federal payments			
2007						
June	3,253,877	361,379	2,892,498	621,978	2,009,269	622,630
July	3,291,113	361,617	2,929,496	629,561	2,037,639	623,913
August	3,271,808	361,166	2,910,642	620,948	2,026,925	623,935
September	3,273,668	361,412	2,912,256	626,806	2,021,979	624,884
October	3,334,497	362,565	2,971,931	631,480	2,075,609	627,407
November	3,215,652	361,041	2,854,611	618,801	1,971,532	625,319
December	3,357,680	362,064	2,995,615	642,355	2,087,346	627,979
2008						
January	3,366,810	369,611	2,997,198	642,967	2,081,735	642,107
February	3,366,130	368,255	2,997,875	646,373	2,079,036	640,721
March	3,392,883	369,029	3,023,854	652,280	2,098,149	642,455
April	3,463,950	369,735	3,094,214	662,372	2,157,503	644,074
May	3,400,489	367,931	3,032,558	650,593	2,108,041	641,855
June	3,460,281	368,409	3,091,872	664,631	2,152,097	643,554

(Continued)

Table 6.
Continued

Month	Total	Eligibility category		Age		
		Aged	Blind and disabled	Under 18	18–64	65 or older
			State supplementation			
2007						
June	371,999	102,203	269,796	18,138	199,482	154,379
July	374,812	102,538	272,273	18,418	201,473	154,921
August	373,994	102,581	271,413	18,140	200,758	155,096
September	374,194	102,826	271,368	18,248	200,436	155,510
October	378,670	103,352	275,319	18,414	203,867	156,389
November	370,680	102,930	267,750	17,846	197,088	155,746
December	378,112	103,208	274,905	18,413	203,324	156,376
2008						
January	375,505	103,034	272,471	18,343	200,908	156,254
February	374,958	102,839	272,119	18,231	200,600	156,127
March	376,716	103,091	273,625	18,428	201,737	156,551
April	381,127	103,427	277,700	18,704	205,382	157,041
May	376,624	103,003	273,621	18,319	201,734	156,571
June	380,952	103,406	277,546	18,710	205,038	157,204

SOURCE: Social Security Administration, Supplemental Security Record, 100 percent data.

NOTE: Data are for the end of the specified month and include retroactive payments.

CONTACT: Art Kahn (410) 965-0186 or ssi.monthly@ssa.gov for further information.

Table 7.
Average monthly payment, by eligibility category, age, and source of payment, June 2007–June 2008 (in dollars)

Month	Total	Eligibility category		Age		
		Aged	Blind and disabled	Under 18	18–64	65 or older
			All sources			
2007						
June	467.70	382.70	484.50	560.10	482.90	385.40
July	466.70	382.50	483.30	555.90	482.10	385.20
August	466.70	382.70	483.40	556.10	482.30	385.40
September	467.10	382.70	483.70	557.00	482.40	385.50
October	465.80	382.60	482.20	551.70	481.60	385.30
November	467.60	382.80	484.30	558.90	482.90	385.60
December	468.40	384.10	484.90	555.30	484.20	386.90
2008						
January	475.70	390.00	492.40	563.00	492.00	393.00
February	476.40	389.40	493.40	568.20	492.20	392.60
March	476.90	390.50	493.70	567.50	492.50	393.50
April	476.40	390.70	493.00	565.40	492.00	393.70
May	477.70	391.00	494.50	571.20	492.70	394.00
June	477.00	391.10	493.50	567.70	492.00	394.10
			Federal payments			
2007						
June	436.30	325.90	457.00	545.60	454.20	333.10
July	435.20	325.60	455.70	541.40	453.40	332.90
August	435.30	325.70	455.80	541.70	453.60	333.00
September	435.70	325.70	456.20	542.60	453.80	333.00
October	434.40	325.40	454.70	537.40	453.00	332.80
November	436.20	325.60	456.80	544.60	454.40	333.00
December	437.10	327.10	457.40	541.10	455.70	334.50
2008						
January	444.60	333.00	465.20	548.80	463.70	340.80
February	445.40	332.50	466.30	554.00	463.90	340.40
March	445.80	333.40	466.50	553.20	464.30	341.20
April	445.40	333.50	465.90	551.20	463.90	341.30
May	446.70	333.70	467.40	557.00	464.60	341.60
June	446.10	333.80	466.50	553.60	463.90	341.60

(Continued)

Table 7.
Continued

Month	Total	Eligibility category		Age		
		Aged	Blind and disabled	Under 18	18–64	65 or older
			State supplementation			
2007						
June	156.50	171.30	151.30	76.80	160.00	172.00
July	156.40	171.30	151.20	76.60	159.90	172.00
August	156.50	171.40	151.30	76.70	159.90	172.00
September	156.40	171.40	151.20	76.60	159.80	172.00
October	156.40	171.40	151.10	76.50	159.70	172.00
November	156.60	171.50	151.30	76.60	159.90	172.10
December	156.60	171.70	151.30	76.40	159.90	172.30
2008						
January	156.30	171.50	151.10	76.40	159.60	172.10
February	156.30	171.30	151.00	76.40	159.60	172.00
March	156.30	171.50	151.10	76.40	159.60	172.20
April	156.30	171.60	150.90	76.40	159.50	172.20
May	156.40	171.70	151.10	76.60	159.60	172.30
June	156.20	171.70	150.80	76.30	159.40	172.20

SOURCE: Social Security Administration, Supplemental Security Record, 100 percent data.

NOTE: Data are for the end of the specified month and exclude retroactive payments.

CONTACT: Art Kahn (410) 965-0186 or ssi.monthly@ssa.gov for further information.

Table 8.
All awards, by eligibility category and age of awardee, June 2007–June 2008

Month	Total	Eligibility category		Age		
		Aged	Blind and disabled	Under 18	18–64	65 or older
2007						
June	65,342	8,489	56,853	13,366	43,362	8,614
July	75,000	8,638	66,362	15,935	50,285	8,780
August	69,927	8,822	61,105	13,822	47,149	8,956
September	68,181	9,054	59,127	13,164	45,843	9,174
October	79,714	8,658	71,056	15,985	54,907	8,822
November	55,429	8,646	46,783	10,452	36,236	8,741
December	77,842	8,198	69,644	15,990	53,520	8,332
2008						
January	67,580	7,531	60,049	13,763	46,159	7,658
February	68,866	8,902	59,964	13,865	45,961	9,040
March	70,815	8,313	62,502	14,395	47,992	8,428
April	85,983	9,111	76,872	17,671	59,044	9,268
May [a]	76,315	8,987	67,328	15,164	52,020	9,131
June [a]	86,698	8,807	77,891	18,478	59,260	8,960

SOURCE: Social Security Administration, Supplemental Security Record, 100 percent data.

NOTE: Data are for all awards made during the specified month.

a. Preliminary data. In the first 2 months after their release, numbers may be adjusted to reflect returned checks.

CONTACT: Art Kahn (410) 965-0186 or ssi.monthly@ssa.gov for further information.

Perspectives—Paper Submission Guidelines

The *Social Security Bulletin* is the quarterly research journal of the Social Security Administration. It has a diverse readership of policymakers, government officials, academics, graduate and undergraduate students, business people, and other interested parties.

To promote the discussion of research questions and policy issues related to Social Security and the economic well being of the aged, the *Bulletin* welcomes submissions from researchers and analysts outside the agency for publication in its Perspectives section.

We are particularly interested in papers that:

- assess the Social Security retirement, survivors, and disability programs and the economic security of the aged;
- evaluate changing economic, demographic, health, and social factors affecting work/retirement decisions and retirement savings;
- consider the uncertainties that individuals and households face in preparing for and during retirement and the tools available to manage such uncertainties; and
- measure the changing characteristics and economic circumstances of SSI beneficiaries.

Papers should be factual and analytical, not polemical. Technical or mathematical exposition is welcome, if relevant, but findings and conclusions must be written in an accessible, nontechnical style. In addition, the relevance of the paper's conclusions to public policy should be explicitly stated.

Submitting a Paper

Authors should submit papers for consideration via e-mail to Michael V. Leonesio, Perspectives Editor, at perspectives@ssa.gov. To send your paper via regular mail, address it to:

Social Security Bulletin
Perspectives Editor
Social Security Administration
Office of Research, Evaluation, and Statistics
500 E Street, SW, 8th Floor
Washington, DC 20254-0001

We regard the submission of a paper as your implied commitment not to submit it to another publication while it is under consideration by the *Bulletin*. If you have published a related paper elsewhere, please state that in your cover letter.

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Formatting Guidelines

To facilitate the editorial process, papers submitted for publication must be prepared in Microsoft Word (**except for tables and charts—see below**) and be formatted as outlined below.

- **Title Page**—Papers must include a title page with the paper's title, name(s) of author(s), affiliation(s), address(es), including the name, postal address, e-mail address, telephone and fax numbers of a contact person. Any Acknowledgments paragraph should also be on this page. In the Acknowledgements, reveal the source of any financial or research support received in connection with the preparation of the paper. Because papers undergo blind review, the title page will be removed from referee copies. Eliminate all other identifying information from the rest of the paper before it is submitted. Once papers are accepted for publication, authors are responsible for reinserting self-identifying citations and references during preparation of the paper for final submission.
- **Synopsis**—For the *Bulletin's* table of contents include a separate synopsis, including the title of the paper along with one to three sentences outlining the research question.
- **Summary**—Prepare a brief, nontechnical summary of the paper (one to two double-spaced pages) describing the research question, methodology, and findings. The policy implications of the findings also should be included.
- **Text**—Papers should average 10,000 words, including the text, the notes, and the references (but excluding the tables and charts). Text is double-spaced, except notes and references, which are double spaced only after each entry. **Do not embed tables or charts into the text. Create separate files (in the formats outlined in "Tables/Charts" below) for the text and statistical material**. Tables should be in one file, with one table per page. Include charts in a separate file, with one chart per page.
- **End Notes**—Number notes consecutively in the text using superscripts. Only use notes for brief substantive comments, not citations. (See the *Chicago Manual of Style* for guidance on the use of citations.) All notes should be grouped together and start on a new page at the end of the paper.
- **References**—Verify each reference carefully; the references must correspond to the citations in the text. The list of references should start on a new page and be listed alphabetically by the last name of the author(s) and then by year, chronologically. Only the first author's name is inverted. List all authors' full names and avoid using *et al*. The name of each author and the title of the citation should be exactly as it appears in the original work.
- **Tables/Charts**—Tables must be prepared in Microsoft Excel. Charts or other graphics must be prepared in or exported to Excel or Adobe Illustrator. The spreadsheet with plotting data must be attached to each chart with the final submission. Make sure all tables and charts are referenced in the text. Give each table and chart a title and number consecutive with the order it is mentioned in the text. Notes for tables and charts are independent of Notes in the rest of the paper and should be ordered using lowercase letters, beginning with the letter a (including the Source note, which should be listed first). The sequence runs from left to right, top to bottom. The order of the notes as they appear below the tables or charts is (1) Source, (2) general notes to the table or chart, if any, and (3) letter notes.

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Program Highlights, 2008

Old-Age, Survivors, and Disability Insurance

Tax Rates for Employers and Employees, Each [a] (percent)	
Social Security	
Old-Age and Survivors Insurance	5.30
Disability Insurance	0.90
Subtotal, Social Security	6.20
Medicare (Hospital Insurance)	1.45
Total	7.65
Maximum Taxable Earnings (dollars)	
Social Security	102,000
Medicare (Hospital Insurance)	No limit
Earnings Required for Work Credits (dollars)	
One Work Credit (One Quarter of Coverage)	1,050
Maximum of Four Credits a Year	4,200
Earnings Test Annual Exempt Amount (dollars)	
Under Full Retirement Age for Entire Year	13,560
For Months Before Reaching Full Retirement Age in Given Year	36,120
Beginning with Month Reaching Full Retirement Age	No limit
Maximum Monthly Social Security Benefit for Workers Retiring at Full Retirement Age (dollars)	2,185
Full Retirement Age	66
Cost-of-Living Adjustment (percent)	2.3

a. Self-employed persons pay a total of 15.3 percent—10.6 percent for OASI, 1.8 percent for DI, and 2.9 percent for Medicare.

Supplemental Security Income

Monthly Federal Payment Standard (dollars)	
Individual	637
Couple	956
Cost-of-Living Adjustment (percent)	2.3
Resource Limits (dollars)	
Individual	2,000
Couple	3,000
Monthly Income Exclusions (dollars)	
Earned Income [a]	65
Unearned Income	20
Substantial Gainful Activity (SGA) Level for the Nonblind Disabled (dollars)	940

a. The earned income exclusion consists of the first $65 of monthly earnings, plus one-half of remaining earnings.

Social Security Administration
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