

Thinking about Unauthorized Population Estimates as Residuals: The Method and Policy Implications

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Abstract

Critical studies set forth unauthorized population estimates which are aggregate estimates derived by a residual technique rather than based on individual-level immigration status. The population-level or census-level survey estimate of foreign-born persons (or aliens) is compared with estimates of the legally resident foreign-born (or alien) population based primarily on administrative data. The discussion summarizes the value for providing insights on the origins, demographic characteristics, geographic distribution of the undocumented alien population, and associated annual average measures of net unauthorized migration or population change due to unauthorized migration. These estimates have implications not only for evaluating immigration enforcement but also for projecting future workers and beneficiaries and evaluating finances for the Old-Age and Survivors Disability Insurance programs.

Key Words: estimation, unauthorized, migration, surveys, foreign-born, immigrant

1. Introduction

This article presents and reviews the residual method or indirect estimation technique for estimating unauthorized populations, extensions to state level, and associated annual average measures of net unauthorized migration or population change due to unauthorized migration. The residual method provides insights on the origins, demographic characteristics, and geographic distribution of the undocumented alien population. Results from the residual method have applications for modeling the future population as to labor force participation, retirement contributions, and retirement patterns and thereby evaluating finances for the Old-Age and Survivors Disability Insurance (OASDI) programs.

Following several indications of unauthorized migration, such as rising border apprehensions and several studies to assess the size of the illegal alien population (U.S. General Accounting Office 1982; Siegel, Passel, and Robinson 1980), the 1980 census count was higher than the independent population estimate based on the previous census count and components of change for the decade. Through the residual method, the 1980 census included about 2.1 million unauthorized residents, including one million Mexican-born persons (Warren and Passel 1987) and one million unauthorized residents in California (Passel and Woodrow 1984). Demographic analysis helped in understanding the possible range of undercoverage in the presence of unknown migration (Passel, Siegel, and Robinson 1982; Fay, Passel, and Robinson 1988). During the 1980s, a series of studies showed net undocumented immigration continuing (Passel and Woodrow 1987) even after the Immigration Reform and Control Act of 1986 (IRCA) (Woodrow

and Passel 1990; Woodrow 1991; Woodrow-Lafield 1992). Over 1990-2010, sustained unauthorized migration resulted in much greater estimates for unauthorized residents in the United States as a major receiver of irregular migrants. Officially, the Office of Immigration Statistics (OIS) in the Department of Homeland Security (DHS) currently utilizes the residual method for producing estimates for unauthorized immigrants that appear in Statistical Abstracts of the United States in 2005-2012.

2. Critical Perspectives on the Residual Method and Unauthorized Estimates

The residual method is a relatively simple approach, but it has been the subject of several critiques. Based on a review of selected studies circa 1990 with national-level illegal alien estimation methods, three for estimating the size of the population (residual method, death registration method, and sex ratio method) and two for estimating the flow (nonimmigrant overstay method and repeated trials method), methods seemed to have improved for narrowing the range on estimates for unauthorized migrants (GAO 1993). Analyzing 1990 U.S. and Mexican Censuses, that review gave the likely maximum estimate of the undocumented population in the United States as 3.4 million. Government auditors cited needs for improving the quality of information on: (1) the legal status of members of the foreign-born population, (2) the geographic distribution of illegal aliens, (3) the size of the illegal alien population uncounted in census surveys, (4) the birth and death rates of the foreign-born population, (5) whether the special agricultural worker applicants under IRCA are being counted in census surveys, (6) the exact emigration of legally resident aliens, and (7) the inconsistencies between the decennial census and the Current Population Survey (CPS). Recognizing needs, experts sought to set high and low values for the components of immigration with probabilistic interpretations for making sensitivity analyses and for specifying asymmetry of high and low values with respect to chosen values (Passel 1991; Woodrow-Lafield 1998a). In *Immigration Statistics: Information Gaps, Quality Issues Limit Utility of Federal Data to Policymakers*, GAO (1998) recommended INS and Census develop a plan of joint research for evaluating the quality of census and survey data in adequately representing the foreign-born population.

In response to U.S. Census Bureau (USCB) plans for state-level estimates for migrants by age, sex, and legal status (Kincannon 2003), GAO noted concerns about quality of survey data for comparison with administrative records-based estimates for legal residents: “While the Bureau of the Census provides some information on the size of the resident foreign-born population, annual net change in size, and emigration, Census has not quantitatively evaluated these data with respect to coverage, accuracy of reported place of birth, or nonresponse rates” (GAO (2004a: 3). GAO further stated “Analysts have raised a variety of questions about possible problems with data on the foreign-born, such as undercoverage (because, e.g., illegal immigrants may deliberately avoid enumeration). Yet Census has not conducted a quantitative evaluation of its census or survey data on the foreign-born” (GAO (2004a: 8). Among post-2000 “enhancement priorities” of the USCB was to “improve estimates of net international migration” and research ways of estimating “international migrants by migrant status (legal migrants, temporary migrants, quasi-legal migrants, unauthorized migrants, and emigrants)” with the overall purpose of producing annual population estimates (USCB 2006). GAO (2004a: p. 19) noted difficulties in deriving such detailed estimates through developing procedures for group imputation of lawful permanent resident status and then expanding to nearly every legal immigration status, so that the numbers and characteristics of illegal alien residents could then be estimated based on a modified residual approach.

GAO (2004a, p. 17) also noted that state-by-state estimates of illegal immigrant residents (INS 2003) relied on comparing legal immigrants' statements about their intended destinations, as reflected in INS administrative records when they were admitted to the United States, to census survey geographic distributions for the total population of foreign-born residents" and would thus be uncertain to the extent that legal immigrants had moved to away from states of their intended destinations. This issue persisted until the DHS estimates as of January 2008-2011 reflected use of modified procedures to utilize any known post-immigration residence, e.g., at naturalization. GAO (2004b, 2011) cited flaws in nonimmigrant statistics for tracking overstays and H-1B workers.

Hill (2006) discussed Census 2000-based studies (Passel, Van Hook, and Bean 2004, 2005, 2006) to develop estimates of legal and unauthorized foreign-born population. His initial criticism was of the residual method's emphasis upon terminology corresponding with INS and DHS legally defined categories for temporary and permanent admission; he particularly disliked the use of "non-immigrant." He prefers thinking in terms of the demographic definition of "international migrant" to mean a person who has changed their country of residence for more than a year. Conceding entirely that "non-immigrant" indeed covers "among others students who may reside in the country for several years, and employees of international organizations for whom it may be decades," the legally defined categories are the building blocks for an administrative estimate of the legally resident foreign-born population.

Certainly, Hill (2006) concurred with GAO on the importance of better information about coverage of foreign-born populations in census surveys. He noted that measures for undercoverage of the unauthorized population are "essentially plucked out of the air" (p. 1). His greatest concern was about the administrative estimate for the legally resident foreign-born population, saying (p. 2) "It is patched together from a wide variety of administrative data sets, all of which contain errors to a greater or lesser extent, plus a core of census-recorded arrivals pre-1980; the magnitude of the ultimate error is impossible to assess." In tandem, he urged more research on the reasonable uncertainty bounds on unauthorized estimates. This and the need for new approaches to estimating the authorized population were among his major conclusions, along with points about weaknesses of CPS data and shakiness of small population estimates.

Given the biases and limitations of unauthorized statistics, surveys of foreign-born populations as to immigration status (Larson and Droitcour 2012; Droitcour and Larson 2008) have been implemented in major cities (Marcelli 2012) and these might be considered for more extensive implementation. Appropriate measures can be taken to safeguard respondent confidentiality and promote participation. The data have numerous potential uses for microsimulation modeling to improve immigration statistics GAO (2006, 1999). At a National Research Council meeting in 2009 and in an article of an *Annals* special issue on the federal statistical system, Douglas S. Massey (2010) stated "Immigration statistics are the weakest link in the U.S. demographic statistics system." Subsequently, Massey (2010, p. 135) wrote succinctly that "Residual estimates, however, are notoriously sensitive to errors in the components; and while mortality and immigration by temporary and permanent legal migrants are known with some precision, the measurement of out-migration rests on assumptions and estimates. It would be useful, therefore, to have an independent means of estimating the size of the undocumented population." (See also, Massey and Capoferro 2004.) In a Wall Street Journal blog (Bialik 2010), Census Director Robert Groves stated that, when it comes to counting

illegal immigrants, "there are a set of assumptions that we know we can't test. . . . we're uncomfortable giving a Census Bureau estimate that is subject to all of these debates." Despite their usefulness for population programs, unauthorized estimates have generally had an unofficial status at the USCB.

3. Residual Methodology and Immigration Components

The major methodology is the well-known population accounting model in which the unauthorized estimate is the residual of statistical aggregates for the foreign-born and legally resident foreign-born populations by characteristics (age, sex, country of birth, period of immigration, and state of residence). The strengths are in the national-level survey data on the foreign-born population by demographic characteristics and national-level administrative data on immigrants or persons admitted for lawful permanent residence, refugees, and asylees. The data consist of (1) foreign-born population stock estimates, that is, data for aliens and naturalized citizens, from the 1980, 1990, and 2000 census detailed sample surveys, the CPS, or the American Community Surveys (ACS) yielding annual estimates and multi-year estimates for smaller subpopulations, and (2) various administrative records-based data from which an estimate is developed for the legally resident foreign-born population. Survey foreign-born estimates are more available now, although residence rules differ for the ACS, CPS, and decennial census, necessitating different analytic approaches (Passel 2012). Coverage of the foreign-born population is complicated and crucial because coverage errors directly affect unauthorized estimates (Woodrow-Lafield 1991a, 1998a, b), but the Census Bureau has not evaluated coverage for the foreign-born population to the same extent as coverage by age, sex, and race. Unauthorized and recent migrants may be more difficult to enumerate due to evasiveness, more recent arrival, and mobility even with cooperation of enforcement authorities during the enumeration period.

The estimate of the legally resident foreign-born population is often referred to as an administrative estimate; it relies on many assumptions and judgments because administrative records do not exist for all migration events complicating the accounting for events relating to the legally resident foreign-born population. The OIS-DHS has records for lawful permanent resident admissions, records for temporary resident admissions, and certain other relevant information. Among administrative records, residents must be distinguished from sojourners for quantifying the legally resident foreign-born population. However, data gaps prevent comprehensive use of nonimmigrant statistics, and resulting residual estimates of the undocumented population include not only unauthorized residents but also legal temporary immigrants and H-1B workers as well as many "ultimately legal" individuals, such as asylum applicants, those with temporary protected or deferred departure status, those covered by class-action lawsuits, others in quasi-legal statuses and lawfully working, and others with a valid claim to a visa (Woodrow-Lafield 1995, 1998a, 1999; Passel 2002). There were 28.4 million admissions of immigrants or lawful permanent residents, refugees and asylees in 1980-2011. Through IRCA's provisions those who had entered without inspection or overstayed visas could make the transition to temporary residence and lawful permanent residence after lengthy unauthorized residence.

The immigration component of net "legal" immigration thus involves legal immigrants (LPRs) from administrative data and legal emigration as estimated, given that emigration events are not tracked for lawful permanent residents, naturalized citizens, or native-born citizens. A key strength is the completeness of the LPR data, but the major

weaknesses are non-inclusion of all long-term migrants and inclusion of admissions without exits. Emigration can only be estimated except for some research for workers based on longitudinal administrative earnings data from 1978 through 2003 (Schwabish 2009). The USCB derives emigration rates by age, sex, and country of birth through comparison of the foreign-born population at successive dates (Woodrow 1991). The method relies on comparability of coverage of various subgroups of the foreign-born population, including unauthorized and other migrants, and the method focuses on long-term resident populations so that assumptions must be made for recent arrivals.

Net “other” immigration, or unauthorized, undocumented, illegal, or unknown migration has greater prevalence in the United States than elsewhere. In summary, estimates of the unauthorized population with the residual method depend upon the availability of a census or survey of population by nativity, the degree of noninclusion of foreign-born residents in a census or survey, and demographic accounting for legally resident foreign-born persons..

The residual method for estimating unauthorized populations has had several variants. The first three variants of the residual method referred to the post-1960 period of entry to the United States except that all Mexicans were included in analyses. Initially, the administrative-based estimate for the legally resident foreign-born population was based on the Alien Address Registration Program and compared with the 1980 census foreign-born population to yield a point unauthorized estimate (Warren and Passel 1987; Jasso and Rosenzweig 1990; Passel and Woodrow 1984). Applying the residual method with data from the decennial census long form for collection of detailed characteristics, including nativity, period of immigration, and citizenship was ideal, albeit with the major drawback of limited timeliness. As the foreign-born population was increasing and the legality dimension was more crucial, delaying any research on unauthorized migration until the 1990 census was not feasible.

Subsequently, analyses carried forward to later dates this base population estimate for the legally resident foreign-born with components of change for legal immigration and assumptions about emigration and mortality (Passel and Woodrow 1987). Occasional CPSs over 1979-1991 collected data on nativity, period of immigration, citizenship, and birthplace of parents. These data allowed research to estimate net change due to unauthorized and legal migration with components of change for the legally resident foreign-born population estimate based on the 1980 data. A third variant of the residual method allowed for incorporating the large numbers of applications or approvals under IRCA legalization provisions or adapted assumptions from these as components of change (Woodrow and Passel 1990; Woodrow 1991a; Woodrow-Lafield 1992). There was ambiguity as to whether IRCA beneficiaries under Special Agricultural Worker provisions were actually residing in the United States. By 1994, nativity and immigration questions were included on a monthly basis.

More recent DHS and Pew Hispanic Center (PHC) studies use variants of the residual method focused on the post-1980 entry population without a base population using legal immigrant flows drawn from lawful permanent resident admissions and information developed for nonimmigrants included in census surveys. The OIS-DHS reports utilize ACS data on the foreign-born population. Until new analyses (Passel 2012), PHC reports had analyzed CPS data on the foreign-born population.

The weaknesses of estimates for unauthorized populations based on the residual method are the sensitivity to errors in components stemming from survey coverage of foreign-born population and lack of emigration data for lawful permanent residents. Consistency errors are likely to exist in comparing survey data which are population-oriented and administrative data which are event-oriented, so that inter-data errors are added to any intra-data errors. Administrative data gaps involve the long-term nonimmigrant population, special status populations, and family members of LPRs. Survey estimates for the foreign-born population may include an unknown number of individuals who later become legal residents but who appear within a resulting residual. A number of consistencies are evident among estimates of unauthorized populations as to magnitude, demographic characteristics, and geographic distribution. Core data from national surveys and on lawful permanent resident admissions are used. Results have consistencies with other studies, such as with administrative data on IRCA legalizations (Passel and Woodrow 1986, 1987) and the Mexican Migration Project studies of Mexican migration over 1985-2011. Inconsistencies may be attributable to methodologies, nonresponse error, response error, special populations, and immigration policies.

4. A Narrative on U.S. Unauthorized Migration, 1970-2011

After few studies on estimated unauthorized residents in the late 1990s (Woodrow-Lafield 2001), several estimates of unauthorized populations became available after 2000, so that a data series exists for 1970-2011, but this series lacks harmonization as to data sources, assumptions, and methodologies. The estimates should be regarded as illustrative of trends and patterns for elucidating a hidden population. A consistent series of unauthorized estimates with ranges is available for the 2000s based on consistent methodologies (Passel and Cohn 2010), but the method may account primarily for undercoverage and sampling variability of foreign population estimates.

Based on an expanding literature, the overall pattern from estimates for unauthorized populations is generally increasing with the exception of the post-IRCA and post-Great Recession periods. Congress passed the IRCA of 1986 to remedy the illegal immigration problem and then passed the IA1990 to expand legal immigration, especially employment categories. Several other policies allowed transition to legal status (Chinese Student Protection Act, NACARA). After the large-scale legalizations from IRCA policies, growth in the unauthorized population was relatively unremarkable in the early to mid-1990s (Bean et al. 1998; Passel 1999). INS underestimated the post-IRCA unauthorized population by including all SAW applicants in the legally resident foreign-born population estimate, and this underestimation persisted in the late 1990s.

There was higher unauthorized migration in 1997-2001, a time of economic prosperity and high demand for labor, resulting in an unauthorized population of about 7.8 million in 2000, or a range of 5.9 to 9.9 million (Bean, Van Hook, and Woodrow-Lafield 2001). The narrative for the 2000s is of an increasing unauthorized population with slight decline in recent years due to lower in-migration, reduced circular migration, lower demand for labor, effective border enforcement, mass deportations, and more guestworker visas (Massey 2009; Massey and Pren 2012). The rate of initial undocumented migration from Mexico reached a peak in 1990 and began declining and the likelihood of making an additional trip declined after 2000 (Massey 2004, 2009, 2010, 2011). The decline in return migration led to increases to the undocumented population during the 1990s; if return migration to Mexico had remained at pre-1986

levels, nearly 2 million fewer undocumented Mexicans would have settled between 1980 and 2005 (Massey 2009).

Following the 2000 Census, there was a mobilization of statistical agencies to measure net immigration and, in particular, net unauthorized migration. Several residual estimates of unauthorized populations became available in the 2000s. As noted earlier, these estimates are highly sensitive to errors in the components. These unauthorized estimates are time-specific and may be overstated, perhaps by millions by inclusion of individuals who gain quasi-legal status or eventually become lawful permanent residents.

The trend was generally one of increasing estimates for the U.S. unauthorized population to about 11.8 million unauthorized residents in January 2007 (Hoefer, Rytina, and Baker 2008) with a decline to about 11.5 million in January 2011 (Hoefer, Rytina, and Baker 2012) based on 2010 ACS data weighted to 2010 census-based controls after lower estimates of about 11 million in 2009-2010 (Hoefer, Rytina, and Baker 2010, 2011; Passel and Cohn 2011). Population coverage of the 2010 Census was evaluated as highly complete (USCB 2012; Cantwell 2012; Devine et al. 2012).

Data and methodological concerns multiply at the state-level (Woodrow-Lafield 2012). INS, and now OIS-DHS, produces state-level unauthorized statistics primarily for purposes of guiding personnel and policy implementation which differs from the USCB mandate in population programs of producing estimates for federal funding allocation. The geographic distribution of the legally resident foreign-born population and the unauthorized population may shift for similar reasons of changes in lawful status, return migration, and internal migration but unauthorized persons are at greater jeopardy of deportation and internal migration. California's share of the unauthorized population declined over 1980-2011, and the share in all other states increased, especially New York, New Jersey, Texas, and Florida.

5. Federal Statistical Methodology and Policy on Unauthorized Estimates

The primary makers of unauthorized estimates are now the OIS-DHS in the Policy Directorate, officially, and the PHC, a non-partisan research organization established in 2001, a credible, external voice that serves to validate and encourage improvements to OIS-DHS reports and methodology. As an enforcement agency, the DHS approach to unauthorized migration statistics is for evaluating enforcement strategies and policy planning. The USCB currently has no responsibilities for measuring unauthorized migration.

The scope of unauthorized statistics includes characteristics of country of birth, period of arrival or entry, selected state of residence, and age-sex detail. A comprehensive "databank" of unauthorized estimates is lacking, perhaps due to emphasis upon current unauthorized estimates. Quality is an open question. Although many recommendations of the NAS report *Immigration statistics: A story of neglect* (Levine, Hill, and Warren 1985) resulted in improvements to immigration statistics, data gaps remain, especially as to timing of beginning long-term stays, unauthorized migration, and emigration of LPRs, nonimmigrants, and unauthorized migrants. The GAO (1998) recommendation remains open that INS and Census develop a plan of joint research for evaluating the quality of census and survey data on the foreign-born population.

Major improvements might involve special surveys on immigrant status with a dual estimation strategy (Droitcour and Larson 2008) and special surveys for identifying emigrants and measuring emigration (Woodrow-Lafield 2010). Census coverage evaluation programs do not make any assessment according to nativity or legal status. There has been a transition from studies with assumptions or evidence that one-third to one-half of unauthorized residents were not counted (Warren and Passel 1987; Levine, Hill and Warren 1985; Passel and Woodrow, 1986; Woodrow 1991, Woodrow-Lafield 1992, 1998a, b, GAO 1993; Fay, Passel, and Robinson 1987) to studies with assumptions or evidence that only 10 to 15 percent are missed due to the greater prevalence of mixed status households and presumably reduced whole-household omissions (Bean, Corona, Tuiran, Woodrow-Lafield, and Van Hook 2001; Deardorff and Baljua 2002; Passel and Cohn 2010). Passel's studies assume an approximate 10 percent undercount for the foreign-born population based on assuming different levels for different categories by origin, age, and sex. Special studies of Los Angeles data on the Mexican-born population at the time of the 1980 and 2000 censuses are regarded as useful in gauging census coverage (Heer and Passel 1985; Marcelli and Ong 2002).

OIS-DHS reports on estimates for unauthorized immigrant population discuss the sensitivity of the estimates to assumptions about undercount and emigration. For example, Hoefer, Rytina, and Baker (2012) note that if the unauthorized immigrant population were undercounted at 20 percent rather than 10 percent, then that would imply a higher estimate for the unauthorized population in 2011 of 13.0 million rather than 11.5 million. Allowing also for higher or lower emigration rates, the resulting range of the estimated unauthorized immigrant population would be 12.0 to 13.9 million. A range for the revised 2010 estimate is 11.0 to 12.1 million (plus or minus 560,000) assuming that emigration and mortality of the foreign born population are between zero and twice the rate for the legally resident population. Better unauthorized statistics can be helpful in sorting out myths and realities of immigration patterns, but tensions are inherent between estimating net population change and evaluating enforcement strategies.

6. Unauthorized Populations and Measures of Unauthorized Migration

A major aspect of USCB research for the 1980s was the dynamics of population change from unauthorized migration. From 1980 Census-based research by census demographers Warren and Passel (1987) about net unauthorized migration over 1975-1980 and Passel and Woodrow (1987) about net unauthorized migration over 1980-1983 and 1979-1983, a range of 100,000 to 300,000 was indicative of average annual population increase due to net unauthorized migration. The midpoint of 200,000 was adopted as a component of change in population estimates and independent population controls for the 1980s (Passel 1985, 1986; Woodrow 1986a, b). Later research was supportive (Woodrow and Passel 1990; Woodrow 1991a; Woodrow-Lafield 1992).

The Office of the Chief Actuary, Social Security Administration (OACT/SSA) independently develops population projections for evaluating the finances of the OASDI programs. The OACT/SSA approach is based on the social security area population of individuals eligible for legally working, becoming insured, and receiving benefits. The assumptions and methods for treating immigration flows in the OACT/SSA models for population projection are explicitly structured as to net legal immigration and net other immigration. Assumptions about net other migration were initially based largely on USCB research on comparisons of residual method-based estimates for unauthorized populations (Passel and Woodrow 1987; Passel 1986; Passel 2002) and assumptions for

population estimates and projections. Beginning in the 2008 Trustees Report (Board of Trustees, Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds 2008), the Trustees greatly improved assumptions and methods in treating complexities of immigration flows (Madrian et al. 2011). The model allowed for higher admissions of legal immigrants; calculating net other immigration as inflows, outflows, and transfers into lawful permanent residence; and improving age and sex distributions.

The 2008-2012 Trustees Reports' treatment of net "legal" and net "other" immigration for the OACT/SSA model draws upon studies on measuring unauthorized migration over 2000-2011 from several sources (INS 2003; Hoefler, Rytina, and Baker 2007, 2008, 2009, 2010, 2011, 2012; Costanza et al. 2003; Passel 2002; Bean et al. 2001). Because the USCB no longer conducts research or makes assumptions about net change due to unauthorized migration, for the 2000-2011 Trustees Reports, OACT/SSA has relied upon available research and OIS-DHS annual reports on the number and characteristics of unauthorized immigrants. Estimated annual net other immigration averaged about 660,000 persons from 2000 through 2004. Estimates of net other immigration for 2005 through 2008 are based on DHS data.

OIS-DHS reports made brief statements based on comparisons noting that measuring average annual population change due to unauthorized migration necessitates having comparable population estimates. Comparisons of unauthorized population estimates for 2000 with later estimates resulted in DHS reporting annual average increases in the unauthorized population of 250,000 for 2000—2009 (Hoefler, Rytina, and Baker 2010), 390,000 for 2000—2008 (Hoefler, Rytina, and Baker 2009), 470,000 for 2000—2007 (Hoefler, Rytina, and Baker 2008), 515,000 for 2000—2006 (Hoefler, Rytina, and Baker 2007), and 408,000 for 2000—2005 (Hoefler, Rytina, and Baker 2006). National survey estimates for 2007—2010 were not comparable due to methodological changes in weighting ACS and CPS national surveys (USCB 2009b, USCB 2011), contributing to overestimation of change in unauthorized migration. The latest DHS report made no statements on change for 2000-2010 and referred only to annual average increase of about 500,000 during 2000 to 2007 (as also for 2000-2006) and apparent declines in authorized migration in 2008 and 2009 (Hoefler, Rytina, and Baker 2011).

Beginning with the 2001 Trustees Report, Table V.A1 Principal Demographic Assumptions, Calendar Years 1940-2075 was initiated and showed 300,000 as preliminary or estimated other immigration in 1999-2000, as did also the 2002 Trustees Report for 2000-01. The 2001-2011 Trustees Reports show differences in published historical data for net other immigration. In the 2003 and 2004 Trustees Reports, this table showed 400,000 as preliminary or estimated other immigration for 2000-03. For the historical data series in the Trustees Reports, other-than-legal net immigration has been footnoted: for 1980-1999 as from 225,000-300,000 (2002 Trustees Report); for 1980-1999 as from 225,000-550,000 (2003 Trustees Report, 2004 Trustees Report); and as 375,000 for 1980-89 and 550,000 for 1990-99 (2005-2010 Trustees Reports). For the 1980s, the amount varied from 225,000 to 374,000. For the 1990s, the amount was as low as 300,000 and reached 550,000. Historical data for other than legal immigration for 1999 has been variously depicted as 300,000 (2001 Trustees Reports), 550,000 (2006-2010 Trustees Reports), or 510,000 (2011 Trustees Report). Six different figures have been published for 2000. There was an unremarkable pattern in the 2008-2010 Trustees Reports, but the 2011 and 2012 Trustees Reports show more variability with "revisions" over the years due to more analyses and administrative statistics, especially for adjustments with certain policies and changes in how the actuaries utilize information.

With the economic recession and consensus of reduced migration after 2007, modifications were made in the 2011-2012 Trustees Reports to base the historical data for net other immigration in 2005—2010 on comparisons of DHS annual estimates for unauthorized immigrants. The goal was to have more real-time measures for recent net unauthorized migration to refine starting values and improve the short-range model. Based on DHS estimates for 2007 and 2008 and due to the weak U.S. economy since 2008, net other immigration levels for years 2007-10 are estimated to be negative in the 2011 Trustees Report. These levels are significantly lower than the positive estimates in the 2010 Trustees Report. The estimated level is 1,045,000 for 2005, decreasing to 710,000 for 2006 and 10,000 for 2007. For 2008, estimated net other immigration is negative, at -770,000, returns to a positive level of 40,000 for 2009, and was at 60,000 for 2010. For years 2011-14, the number of other immigrants entering the country is assumed to be lower than in the 2010 Trustees Report through assumption of slow economic recovery. The effect of including these new immigration data and assumptions is a decrease in the long-range OASDI actuarial balance of 0.05 percent of taxable payroll. OACT/SSA seems to rely upon DHS estimates for unauthorized residents in substantially the same manner as administrative counts of lawful permanent residents.

7. Conclusion

The residual methodology has portrayed net unauthorized migration over four decades. Available estimates for unauthorized immigrants were informative for shaping the IRCA policies on legalization and agricultural workers. There were substantial requirements for federal agency reporting on the legalization program and outcomes for generally legalized immigrants. Outcomes of IRCA-legalized immigrants may not be relevant for immigration policy as to any regularization or legalization program for contemporary unauthorized residents. Regardless of past transitions of formerly undocumented aliens to lawful permanent resident and citizen, many policymakers seemed opposed to ever having another legalization program (Newton 2008).

Federal agencies have made progress in the area of immigration statistics, including annual production by OIS-DHS of reports on the number and characteristics of unauthorized immigrants. Yet the public acceptability and statistical defensibility of unauthorized statistics are questions meriting further investigation. Two cautions are necessary. First, unauthorized estimates have not undergone the same extent of review as in other statistical matters (e.g., census adjustment for coverage error or poverty measurement). External validation through replication studies is constrained by limited accessibility to microdata files of immigration statistics by non-government researchers. Second, measures for net population change due to unauthorized migration are not easily derived from these studies, and change measures are vulnerable to methodological differences in studies. Although many recommendations of the 1985 NAS report resulted in improvements, gaps remain, especially as to quality of census surveys on the foreign-born population, timing of beginning long-term stays, unauthorized migration and emigration (LPRs, nonimmigrants, and unauthorized migrants). Actuarial modeling of immigration by legal status would benefit from refinements in estimates of unauthorized migration, transitions to legal status, and emigration.

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