

MEASURING THE ECONOMIC AND SOCIODEMOGRAPHIC CHARACTERISTICS OF UNAUTHORIZED IMMIGRANTS IN THE UNITED STATES WITH SURVEY DATA

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In addition to estimating the number of unauthorized immigrants residing in the United States, scholars and policymakers are interested in immigrants' economic and sociodemographic characteristics. In this article, the second of three related articles, we describe methodological techniques used in estimating the population of unauthorized immigrants and their characteristics based on data from national surveys. Because large surveys typically do not ask about legal status, researchers use imputation techniques to identify potentially unauthorized immigrant populations. When applied to data from the Current Population Survey, the American Community Survey, and the Survey of Income and Program Participation, these techniques illuminate differences between likely authorized and unauthorized immigrants in such characteristics as job stability, occupation, and industry of employment. We review studies that have used such techniques. We also discuss research on the correlation between residential permanence and human capital investment among unauthorized immigrants.

Introduction

Accurate measurement of the various trends, aspects, and outcomes of unauthorized immigration is challenging, as sources of information tend to be limited or indirect. Nevertheless, survey results have been used to estimate the size of the unauthorized immigrant population, as discussed in our preceding article, and as a source of information on the characteristics of that population (Capps, Bachmeier, and Van Hook 2018). In this article, we describe some of the common methodological techniques that have been applied to survey data to estimate population characteristics—such as earnings, employment, and household composition—of unauthorized immigrants. We first discuss how imputation methods are used to identify potential unauthorized immigrants among the foreign-born residents counted in national surveys. We then summarize results from a selection of the existing literature on this topic. We follow that with a brief

discussion of the relationship between the duration of U.S. residence and human capital investment, and a concluding summary.

Imputing Unauthorized Status

Most surveys, including large national federal surveys, provide no direct measure of noncitizens' legal status. Therefore, researchers interested in examining the characteristics of the unauthorized immigrant population—and how they may differ from

Selected Abbreviations

ACS	American Community Survey
CPS	Current Population Survey
LPR	lawful permanent resident
MMP	Mexican Migration Project
SIPP	Survey of Income and Program Participation

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those of documented noncitizen immigrants—must use indirect measures. To this end, two techniques—logical imputation and statistical imputation—are often used to identify potentially unauthorized populations and to estimate the likely distribution of those populations across economic and demographic characteristics.

Logical imputation starts with identifying survey variables that are associated with authorized U.S. residence among noncitizens: for example, being a veteran or a government employee, having a certain occupational specialty, or receiving public benefits such as Medicaid coverage or Supplemental Security Income. Respondents with such characteristics are removed from the study population, and the remaining pool of potentially unauthorized immigrants is further reduced through multiple adjustments that vary depending on the research methodology. For example, some strategies randomly distribute immigrants into authorized and unauthorized pools to reflect a target benchmark based on estimates from the Department of Homeland Security or independent organizations such as the Pew Research Center. Others use information about immigrants' characteristics from the Census Bureau's Survey of Income and Program Participation (SIPP), a national longitudinal survey that follows panels of respondents over 1- to 5-year spans, with follow-up surveys administered to panel members in multiple waves. For its 1996 through 2008 panels, SIPP supplemented its core survey with a separate migration module, which asked immigrant respondents about their legal status upon arrival in the United States and whether that status had changed up to the time of the survey (Tamborini and Villarreal 2021).

A good example of logical imputation is found in Bachmeier, Van Hook, and Bean (2014). The authors use SIPP migration-module data to sort respondents into likely authorized and likely unauthorized groups. In the first step, the authors assign foreign-born individuals who report U.S. citizenship to the likely authorized group. Noncitizen immigrants who report entering the United States as lawful permanent residents (LPRs) are likewise sorted into the likely authorized group.¹ Respondents who are not U.S. citizens and did not enter as LPRs but who report changing to LPR status after arriving are also considered likely authorized (although this question last appeared in questionnaires for the 2008 panel).²

Other works that impute legal status employ “data fusion,” or analyzing the characteristics of SIPP migration-module respondents and applying those

distributions—as predictors of likely authorized or unauthorized status—to data for foreign-born respondents from another survey that features a much larger respondent sample, such as the Census Bureau's Current Population Survey (CPS) or American Community Survey (ACS) (Van Hook and others 2015; Capps, Bachmeier, and Van Hook 2018).^{3,4} In other words, educational, income, and other characteristics of SIPP respondents that can be gleaned from the migration module are applied to the larger CPS or ACS samples. For this technique to be valid, the variables of interest must be observed in both the SIPP's and the larger survey's samples (Van Hook and others 2015).

One potential drawback of statistical imputation from one survey to another is that it is quite complex and requires a number of additional assumptions to be made beyond logical allocation. Further, the public-use data for the SIPP migration module reports only LPR status and excludes information on students, workers, and other noncitizens with legal temporary resident status. The 2008 SIPP panel also lacks individual variables for country of birth, which biases the country-of-origin information drawn from other SIPP panels. Moreover, although the ACS and the CPS are conducted annually, the SIPP is not;⁵ this makes the fusion of cross-survey data on the characteristics of unauthorized immigrants difficult for short or medium time periods.

Despite the depth of information on immigrant characteristics available from the SIPP migration module, its usefulness for estimating the size of the unauthorized immigrant population is limited. As noted earlier, the SIPP is not administered to a new (and expansive) sample every year like the ACS or CPS. Rather, as a medium-term longitudinal survey, SIPP follows a panel over a span of 1–5 years, with follow-up survey waves administered during that period.⁶ Theoretically, one could use the logical allocation method with the migration-module results to estimate the likely unauthorized immigrant populations for 2004 and 2008 using only the SIPP panels for those years. However, trends and changes for 2005–2007 and 2009–2011 cannot be tracked using SIPP because it is not an annual survey, and panel attrition—and differential selection out of the panel by documentation status—might introduce biases in the survey waves for the later years of the panel.

Furthermore, the SIPP migration module included a key question that was used to proxy for documentation status (specifically, whether an immigrant had changed from non-LPR to LPR status since arrival in the United

States); but the migration module was eliminated from SIPP panels after 2008. Without this question, an estimated 5–10 percent of LPRs could be unidentifiable in the more recent SIPP data, resulting in an over-estimated count of unauthorized immigrants. The ACS and CPS do not contain similar questions.⁷

A potential drawback of all the survey-based methods is that they likely undercount all immigrants, particularly those who are unauthorized (Baker 2021; Passel and Cohn 2016; Passel and Krogstad 2023; Van Hook and others 2014). This might appear to be of greater concern for research that aims to estimate the size of the unauthorized immigrant population than for efforts to compare the characteristics of potentially unauthorized and likely authorized immigrants. However, unauthorized immigrants who respond to surveys are not representative of the entire immigrant population and therefore may bias the population-characteristics estimates of immigrants overall and by legal status (Capps, Bachmeier, and Van Hook 2018). The accuracy of measures of legal status based on logical imputation or statistical imputation relies on the accuracy of the survey-based variables used.

Selected Findings from the Literature

Using the methods described above and national survey data, a small but growing body of literature has attempted to identify the characteristics of the U.S. immigrant population by legal status. We highlight selected findings from a sample of the existing studies here; this is not an exhaustive literature review.

Hall, Greenman, and Farkas (2010) use logical imputation and SIPP migration-module data from the 1996 and 2001 panels to examine differences in working conditions across four groups: likely authorized Mexican immigrants, likely unauthorized Mexican immigrants, U.S.-born Mexican-Americans, and U.S.-born non-Hispanic White people. Their analysis suggests that among male Mexican immigrants, those who are likely unauthorized are concentrated in lower-skilled service jobs and earn 17 percent less than their likely authorized counterparts. The corresponding wage advantage for likely authorized female Mexican immigrants is 9 percent. The authors also find lower returns on human capital and slower wage growth for likely unauthorized male Mexican immigrants than for their likely authorized counterparts: the return to education for the former is half the return for the latter.

Using similar methods and more recent (2004 and 2008) SIPP panels, Greenman and Hall (2013) address variation in educational attainment among Mexican

and Central American immigrants by legal status. They find lower high school graduation and college enrollment rates among the likely unauthorized, a differential not explained by family background. Hall, Greenman, and Yi (2018) use data from the 1996, 2001, and 2004 SIPP panels to examine job mobility among likely unauthorized immigrants and find that those from Mexico and Central America have lower job mobility than likely authorized immigrants from the same areas. Moreover, when unauthorized immigrants changed jobs (either within or across firms), their rates of switching to similar jobs (rather than upward transitions) were higher than those of U.S.-born workers and likely authorized immigrants.

Using logical imputation methods based on data from the SIPP core and migration modules, Tamborini and Villarreal (2021) explore differences in job stability among immigrants during the Great Recession by likely legal status and Hall, Musick, and Yi (2019) study family composition among Hispanic immigrant households. Tamborini and Villarreal find that likely unauthorized immigrants faced greater job instability, particularly underemployment, during and after the Great Recession than did legal resident immigrants. Hall, Musick, and Yi find that unauthorized Hispanic immigrants exhibited more complex living arrangements than other groups did, such as being more likely to reside with extended family and nonfamily members. Over the observation period, likely unauthorized Hispanic immigrants also experienced greater family instability (in terms of changing family size and structure) than other groups did.

Other research uses ACS data to examine differences in immigrant characteristics by legal status. Passel and Cohn (2016) examine occupation and industry of employment differences between likely unauthorized and legal immigrants using a probabilistic process to impute legal resident status for survey respondents based on age, region of birth, family relationships, and other demographic characteristics. This method extends the residual method of estimating the size of the unauthorized immigrant population, which we described in the first of these three related articles (Duleep and others 2025). Passel and Cohn find substantial within-group variation in the occupation and industry of employment among immigrants by legal status. Likely unauthorized immigrants tend to be employed in low-skilled occupations characterized by informal and nonstandard work arrangements, including landscaping, foodservice, and hospitality. They are also concentrated in construction and farmwork:

Passel and Cohn estimate that in 2014, unauthorized immigrants constituted 15 percent of workers in construction and 26 percent of those in farming.

Borjas (2017a and 2017b) uses data files constructed by Pew Research Center analysts to examine the labor market characteristics of immigrants by legal status based on ACS and CPS data. Using a variant of a probabilistic logical imputation method described in Passel and Cohn (2014), Borjas also finds labor market differences between unauthorized immigrants, authorized immigrants, and the U.S.-born population. Consistent with Hall, Greenman, and Farkas (2010) findings using the SIPP, Borjas (2017a) observes that wages and returns on education are lower for likely unauthorized immigrants than for authorized immigrants and U.S.-born workers, with legal status associated with wages that are between 6 percent and 14 percent higher. Borjas (2017b) also finds substantially higher labor force participation and employment rates among likely unauthorized immigrant men than the likely authorized group (as does Albert 2021). By contrast, among women, unauthorized immigrants experienced substantially lower employment rates than their likely authorized counterparts. Bean, Brown, and Bachmeier (2015) impute the legal status of Mexican immigrants using the 2012 ACS and find lower earnings among likely unauthorized men.

Permanence of U.S. Residence and Investment in Human Capital

In estimating the number of unauthorized immigrants and in understanding their characteristics, it is important to differentiate between those who stay in the United States permanently and those with temporary U.S. residency.⁸ Unauthorized immigrants are more likely to return to their countries of origin than authorized immigrants are (Sohn and others 2023).

The Mexican Migration Project (MMP), a joint Mexican and American interdisciplinary research effort established in 1982, gathers information on migrants who are—at least initially—relatively transient. The MMP conducts interviews in the winter months, when many migrants return to their home country to join their families. Out-migrant samples are also taken, matching those communities with migrants residing in the United States.⁹ The MMP data reveal a population that mostly lacks U.S. legal status, whose members transit back and forth between the United States and Mexico, and who generally experience low U.S. earnings growth.

In another MMP study, Massey (1986) probes the role of permanence and finds that migrants form social and economic ties as they accrue time in the United States, which increases the chances that they will attempt to settle permanently. With time, migrants bring their family members and, with greater permanence, they secure more stable, better paying jobs. These data have also been used to analyze the role of economic and social factors in the decision to attempt unauthorized migration (Ryo 2013).

Using data collected by the China International Migration Project, Chunyu (2011) traces the work trajectories of immigrants from China's Fujian province, the source of the largest wave of Chinese emigration in the 1990s. Like their Mexican counterparts, these immigrants are mostly unauthorized, with low levels of education: 41 percent possess no more than an elementary-school education. Yet, in contrast with the Mexican unauthorized immigrants, few return to China.

A window on the effect of permanence within the more generally transient Mexican unauthorized population is opened by examining individuals who applied for legal status under the 1986 Immigration Reform and Control Act (IRCA). Under IRCA, 1.7 million persons were legalized by 1990, 1.3 million of whom were Mexican. Individuals could attain legal status if they could show “long-term” U.S. residence.¹⁰ Thus, those who applied for legal status are a relatively permanent subset of the unauthorized population.

From IRCA's processing system, the Legalized Population Survey (LPS) data file was created, with information on the jobs and earnings of these individuals at three points in time—when they first entered the United States, when they sought legal permanent residence, and several years thereafter. Using the 1989 LPS, Powers and Seltzer (1998) find that real median earnings rose 21 percent for unauthorized immigrant men between their initial U.S. job and the time they applied for legal status. Using a scale that reflects the relative economic status indicated by detailed occupations, Powers and Seltzer also find meaningful earnings gains for the study population in the period before they attained legal status.¹¹ The study results suggest that within a population generally characterized by impermanence and low earnings mobility, earnings growth exists for those who reside for longer periods in the United States.

Using data from various university and local government surveys conducted in southern California,

Cornelius and Marcelli (2000) find that permanent settlement of Mexican migrants in the United States began to increase in the 1970s and accelerated during the 1980s. Permanence thus varies across groups of unauthorized immigrants as well as over time for the same group: A historically transient group may begin to trend toward more permanence, and permanence affects certain characteristics—such as earnings—of unauthorized immigrant groups in ways that affect the accuracy of unauthorized immigrant population estimates.

Conclusion

Scholars and policymakers explore the extent to which the economic and social characteristics of immigrants vary by legal status. This article describes some methodological strategies that have been employed to identify the characteristics of potential unauthorized immigrants using data from national surveys. We have focused on methods of imputing legal status and then have summarized results from selected studies that follow such strategies. Future work would benefit from developing more precise measures, if possible, of immigrants' legal status. Perhaps current methods that essentially impute legal status could be combined with information indicating whether the survey data can be matched to administrative data records. The third of our three related articles (Gesumaria and others 2025) examines such potential survey–administrative data linkages.

Notes

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¹ To protect respondent confidentiality, the SIPP groups all immigrants who were non-LPRs at U.S. entry under a single “other” category. In addition to unauthorized immigrants, that category includes workers, refugees, asylees, tourists, business travelers, and diplomats and other political representatives with legal temporary resident status.

² Imputed values for all questions used to infer documentation status are not considered in the assignment of likely status.

³ The CPS is conducted by the Census Bureau for the Bureau of Labor Statistics.

⁴ Keister and Aronson (2017) also use data fusion, applying characteristics found in SIPP data to results from the Federal Reserve Board's Survey of Consumer Finances.

⁵ For some SIPP panels, particularly newer panels, follow-up waves are conducted annually; but these yearly reiterations are not equivalent to fielding the survey to new participants each year, as the ACS and CPS do.

⁶ SIPP waves are fielded at regular intervals that vary from panel to panel.

⁷ The questions about migration that remain in the more recent SIPP panels are less detailed than the previous versions were. For example, the 2014 and later SIPP panels do not ask whether non-LPR arrivals had subsequently attained LPR status.

⁸ Duleep and Regets (1994, 1999, and 2002) and Duleep and others (2020) explore the role of permanence in human capital investment among immigrants and model its effects.

⁹ See Massey and Zenteno (1999) for further information. The collected data, compiled in a comprehensive database, has formed the foundation for Orrenius and Zavodny (2003), Donato, Durand, and Massey (1992), and numerous other studies.

¹⁰ For applicants granted specialized agricultural worker status, the requirements for legalization were much more lenient (only 90 days of continuous agricultural employment in the past year). Comparing their experiences with those of long-term U.S. resident immigrants thereby provided a potential natural experiment on the effect of permanence.

¹¹ The initial occupational status scores of this population placed the unauthorized immigrants in the lowest one-fifth of all U.S. occupations. By the time they applied for legal status, these immigrants were no longer in the lowest occupational-status quintile.

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