



RESEARCH REPORT

The Economic Impact of Naturalization on Immigrants and Cities

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December 2015

Supported by

NYC
Mayor's Office of
Immigrant Affairs

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Acknowledgments

This report was commissioned by the New York City Mayor’s Office of Immigrant Affairs and funded by Citi Community Development. We are grateful to our funders, who make it possible for Urban to advance its mission. It is important to note that funders do not determine our research findings or the insights and recommendations of our experts.

We appreciate the comments of Sam Solomon of the New York City Mayor’s Office of Immigrant Affairs and Hamutal Bernstein, Dan Kuehn, and Greg Acs from the Urban Institute; we also appreciate the programming assistance of Joyce Morton, Elissa Cohen, and Megan Thompson from the Urban Institute. For providing data for San Francisco, we acknowledge the California Department of Social Services and the San Francisco Office of Civic Engagement and Immigrant Affairs; Department of Public Health; Mayor’s Office of Housing and Community Development; Housing Authority; Office of the Controller; and Human Services Agency.

The microsimulation analysis relies upon previous investments in the development of the TRIM3 modeling system. The Office of the Assistant Secretary for Planning and Evaluation of the Department of Health and Human Services funds and holds the copyright to the version of TRIM3 that operates on Current Population Survey data. TRIM3’s adaptation to the American Community Survey was funded by the Annie E. Casey Foundation and the MacArthur Foundation.

Foreword: Statement from Funders

Citizenship is an economic asset.

Americans have long understood the emotional and social importance of naturalization. Now, we are pleased to present the Urban Institute's research findings on the powerful economic effects of naturalization on individual immigrants as well as on their communities and the economy at large.

This research demonstrates the immense value to cities when they empower their eligible immigrant residents to naturalize and integrate into their local economies. Along with our partners at Cities for Citizenship, we are committed to lifting up and supporting cities' efforts to harness naturalization as a powerful tool for financial inclusion and inclusive growth. Learn more at CitiesforCitizenship.org.

We thank the Urban Institute for this important report and sincerely hope that it will inform and inspire all those who want to build inclusive cities, where everyone can fulfill their potential and contribute to thriving urban economies.

We thank you for reading.



Nisha Agarwal
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Executive Summary

Nationwide, about 8.8 million immigrants are eligible to naturalize but have not yet done so. Less than 10 percent of this group naturalizes per year. This report quantifies the economic benefits of naturalization to those eligible immigrants and the cities where they live and presents the first published estimates of the effect of naturalization on expenditures for public benefits.

We examine naturalization-eligible immigrants in 21 cities, including cities both large and small, historic immigrant gateways as well as new immigrant destinations, and all 18 of the Cities for Citizenship coalition as of August 2015.

Using econometric and microsimulation models, we are able to make important new findings about the benefits of naturalization for those eligible to naturalize and about effects of increased naturalization on the communities where they live. With naturalization

- individual annual earnings increase by an average of 8.9 percent, or \$3,200;
- employment rate rises 2.2 percentage points; and
- homeownership increases 6.3 percentage points.

The earnings increase and employment gains from the naturalization of those eligible to naturalize translate into \$5.7 billion in the 21 cities combined. Naturalization of those eligible also increases tax revenues. Federal, state, and city income tax and federal payroll tax (from both employers and employees) revenue would increase by \$2.03 billion in the 21 cities if those eligible to naturalize became citizens. These findings confirm and expand on previous research in this area, showing economic benefits for individuals and their communities.

Finally, we are presenting the first-ever study of the effect of naturalization on the use of and expenditures on public benefits programs, using New York City and San Francisco as detailed case studies. In New York City, naturalization causes a decrease in the overall cost of six public benefits: child care subsidies, Temporary Assistance for Needy Families (TANF), the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), the Supplemental Nutrition Assistance Program (SNAP), housing assistance, and the Low Income Home Energy Assistance Program (LIHEAP). The decreased costs in those programs are offset partially by a rise in Supplemental Security Income (SSI) expenditures. In San Francisco, the naturalization of the eligible will slightly raise government benefit expenditures.

We find that if all naturalization-eligible immigrants in New York City and San Francisco were to become citizens, the following results would apply:

- In New York City, annual city, state, and federal tax revenue would rise \$789 million and public benefits costs would decrease \$34 million, for a net benefit of \$823 million.
- In San Francisco, city, state, and federal tax revenue would rise \$90 million and public benefits costs would increase \$4 million, for a net benefit of \$86 million.

Based on these findings, we conclude that programs promoting naturalization for those who are eligible could be a powerful mechanism for cities to harness the full economic contribution of immigrants and promote local economic development.

From coast to coast, through initiatives like Cities for Citizenship and Welcoming America, municipal leaders, community groups, and the private sector are beginning to collaborate on initiatives to expand outreach, provide legal assistance and financial coaching, and offer civics and English language classes to promote naturalization. These findings demonstrate the value of further developing such programs and additional research on the most effective methods to increase naturalization and realize the economic benefits of citizenship for immigrants and their communities.

Economic Impact of Naturalization on Immigrants and Cities

One of the most iconic images of immigrant integration into the society and polity of the United States is the naturalization ceremony. In the past five years, an average of 719,000 immigrants annually have taken the Oath of Allegiance to the United States of America and become US citizens.¹ Naturalization underlies the “remarkable idea that it is possible for anyone to become American, no matter where they were born” (Thorman 2010). Becoming a US citizen is an important marker in the integration trajectory of immigrants. It is a clear expression of membership and belonging to the country the immigrant now calls home (Aleinikoff 2009; Jones-Correa 2001; Mendoza 2013).

Naturalization confers rights and duties and puts immigrants on an equal footing with US-born citizens. Naturalized immigrants can vote in national, state, and local elections; are protected from deportation; travel with a US passport; can access all federal government jobs; can petition for visas for their immediate relatives without getting in a queue; and can access all government benefits just as US-born citizens can. The sense of security that comes with American citizenship and a commitment to one’s adopted home can lead to increased productivity and long-term investments in the receiving country, such as buying a house or opening up a business.

But an estimated 8.8 million immigrants are able to naturalize but have yet to do so (Baker and Rytina 2014). Government policies can affect immigrants’ decisions to naturalize. Comparing Canada and the United States, Bloemraad (2002, 2006) concludes that the integration support Canadian immigrants receive from the state is one of the main factors explaining the higher naturalization rate in Canada. In the United States, the federal government has traditionally taken a more passive role in the integration of immigrants and has dedicated relatively few resources to promoting and supporting naturalization.²

Recognizing the importance of naturalization in the integration process of immigrants and the potential benefits it can bring to the immigrants themselves and their communities, cities across America are adopting programs and practices to foster naturalization. These initiatives could greatly increase naturalization rates because naturalization is a collective process that draws from the collective experience of immigrants (Logan, Oh, and Darrah 2012). The Cities for Citizenship initiative is a national initiative aimed at increasing citizenship and encouraging municipalities to invest in citizenship programs.³ The New Americans Campaign brings together legal-service providers, faith-

based organizations, businesses, foundations, and community leaders to pave a better road to citizenship,⁴ and the National Partnership for New Americans promotes strategic and collaborative work between community organizations and cities to create effective local programs and to promote the value of US citizenship.⁵ The National League of Cities has also been involved in promoting citizenship across municipalities.⁶ And in September 2015, the White House launched the “Stand Stronger” Citizenship Awareness Campaign, a national, multilingual public awareness campaign to promote citizenship.

This study estimates the economic impact of naturalization on 21 cities. The cities examined are Atlanta, GA; Baltimore, MD; Boston, MA; Chattanooga, TN; Chicago, IL; Dallas, TX; Denver, CO; Houston, TX; Jersey City, NJ; Los Angeles, CA; Miami FL; Milwaukee, WI; Nashville, TN; New York, NY; Philadelphia, PA; Pittsburgh, PA; Reading, PA; San Francisco, CA; San Jose, CA; Seattle, WA; and Washington, DC. All but three of these cities (Dallas, Houston, and Miami) are members of Cities for Citizenship as of August 2015. The many variations among the cities make them good laboratories for studying the impact of naturalization: they range from small to large in population, some are traditional immigrant gateways and others are new immigrant destinations, and they have different ethnic and racial compositions.

Estimating the potential impact of naturalization poses significant methodological challenges. To identify a reliable sample of the population eligible to be naturalized, we use data from the combined 2011–13 American Community Survey (ACS), following a well-established method to impute detailed immigration status and identify those eligible to naturalize. To obtain estimates of the effects of naturalization for earnings, employment, and other economic outcomes at the individual-level, we use propensity score matching (PSM) statistical techniques. Then, to assess how those changes ripple through tax and transfer programs, we use a version of the Transfer Income Model version 3 (TRIM3) that operates on data from the American Community Survey.

We estimate that 23 percent of the foreign-born population in the 21 focus cities is eligible to naturalize. Naturalization increases earnings of the naturalization eligible 8.9 percent, increases their probability of homeownership 6.3 percentage points, reduces self-employment 2 percentage points, and increases overall employment 2 percentage points. The aggregate economic impact depends on how many of those eligible to naturalize become citizens. Combined earnings for the 21 cities would increase \$5.7 billion and combined tax revenues would increase \$2.03 billion if all those who are eligible to naturalize were to do so. Naturalization could produce 45,000 new homeowners in these 21 cities.

Naturalization is therefore a mechanism to improve the economic well-being of immigrants. In addition, these wage effects represent an untapped source of tax revenue for governments. Local governments and nonprofit organizations have already begun to implement ambitious naturalization-promotion programs across the country. This study underscores the importance of such programs for the integration of immigrants to improve their well-being and ability to contribute to local economic development.

A Framework for Understanding Naturalization Decisions

Naturalization is a deeply democratic idea (Wegner 2013). After meeting the requirement for years of residence, most legal permanent resident immigrants can become citizens, and citizenship remains the choice of the immigrant: nobody is coerced or forced to naturalize.

One approach to understanding the naturalization decision is the individual cost-benefit calculus. In deciding whether or not to naturalize, immigrants weigh the benefits against the costs of naturalization (Chiswick and Miller 2009; Jasso and Rosenzweig 1986). Naturalization increases access to tangible and nontangible resources, conferring political and economic rights (Van Hook, Brown, and Bean 2006). A survey of Latinos found that the most common reasons they naturalize are to gain civic and legal rights and for benefits or opportunities; a combined 34 percent of survey respondents gave those reasons for naturalizing (Gonzalez-Barrera et al. 2013). Other reasons cited concerned family, American identity, and a feeling that the United States is home. Similarly, a survey of Texas immigrants in the mid-1990s found that most immigrants seek naturalization to participate fully in American life, to be able to sponsor the immigration of relatives, and to ensure a better future for their children (Freeman et al. 2002). Among minority immigrants, naturalization could also be a way to defend and assert the right to belong (Bloemraad 2006; Mazzolari 2009; Van Hook, Brown, and Bean 2006) in what Yang (1994) calls forced self-protection.

From the cost-benefit approach, individual characteristics and state policies that affect the costs and benefits of becoming a citizen influence the likelihood of an immigrant's naturalization. One policy change that has received attention is the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA), which denied a range of federal safety-net benefits to some legal noncitizens. Before PRWORA, only unauthorized immigrants and temporary residents were categorically disqualified for benefits. Some of the benefits were restored by subsequent legislation, but today most

authorized noncitizens with less than five years residency in the United States remain ineligible for many government benefits. Supplemental Security Income (SSI) is the benefit most affected by naturalization. Qualified citizens can access SSI benefits with no work requirements. However, most noncitizens who arrived after August 22, 1996, even those with more than five years of US residence, can get SSI only if they have at least 40 quarters of work.⁷ Some researchers argue that PRWORA exposed the vulnerability of legal permanent residents and prompted “protective citizenship”—becoming naturalized to be able to obtain welfare benefits if ever needed (Gilbertson and Singer 2003; Nam and Kim 2012; Van Hook, Brown, and Bean 2006). Most recently, environments in some states hostile to unauthorized immigrants may be creating a sense of vulnerability among legally residing immigrants, especially considering the high incidence of mixed-status families (Enchautegui 2013; Levin 2013).

Another policy affecting the cost-benefit balance of naturalization is dual citizenship. Since the mid-1990s, an increasing number of countries—including important sending countries, such as Mexico, the Dominican Republic, and El Salvador—accept dual citizenship (Jones-Correa 2002; Mazzolari 2009). Loyalty to the home country may lead immigrants to feel that naturalization is a denial of identity, a breaking of loyalty to the country left behind and to friends and relatives left at home (Hammar 1985). However, dual citizenship allows the immigrant to belong to two worlds. Gilbertson and Singer (2003) argue that today more people want to be members of more than one state, and naturalization can be a transnational strategy to keep links in more than one place and with families spread between two countries. Not having to give up one’s birth citizenship reduces the cost of naturalization (Mazzolari 2009).

But factors other than individual motivations are at play in the decision to naturalize. Immigrants do not approach the question of citizenship only as individuals but also through shared experiences with those who came from the same country, who have settled in the same community, and who have the same race and ethnic background (Jones-Correa 2001; Liang 1994; Yang 1994). Bloemraad (2003, 2006) calls attention to the institutional context of reception, given that “naturalization is embedded within a larger institutional and policy environment” (2006, 275). Beyond the individual cost-benefit calculus, the state plays a role in naturalization decisions. It shapes the meaning of naturalization and helps immigrants visualize its benefits. Availability of institutional and state programs, administrative bureaucracies, and integration policies all influence how welcome immigrants feel at arrival and provide material and symbolic meaning to naturalization (Bloemraad 2003; Lewis and Ramakrishnan 2007; Logan, Oh, and Darrah 2012; Marrow 2009). Countries’ integration policies create a “collective” experience that could promote or discourage naturalization (Logan, Oh, and Darrah 2012). From this

perspective, the local context of reception, exemplified by policies, programs, receptivity to immigrants, and bureaucratic norms, can foster naturalization. In combination, the cost-benefit approach and the institutional approach provide a comprehensive picture of the naturalization decision.

Benefits of Naturalization

If naturalization produces economic benefits, such benefits should stem from the opportunities that open up upon acquiring citizenship. These opportunities can have direct or indirect effects on economic well-being. Here, we describe the benefits of citizenship and how they can lead to economic gains.

- *Access to a broader range of employers:* The most direct benefit of naturalization is access to work all available jobs in the federal government,⁸ the largest employer in the United States, and with other government agencies and government contractors. In addition, naturalized citizens travel abroad with American passports, and having an American passport can open up opportunities in jobs that require overseas travel because it reduces effort and potential risk for the employer. Naturalization can also improve access to private-sector jobs that require a high security clearance (Pastor and Scoggins 2012).
- *Right to vote:* Naturalization gives immigrants the right to vote in national, state, and local elections and referenda. By voting, especially in local areas, naturalized citizens can increase the attention of lawmakers to issues that are relevant to immigrants and bring resources to immigrant communities, such as better school services, after-school programs for immigrant children and youth, better transportation services, increased resources for English-language education, and changes in immigration laws. Immigrant voting can also foster coalitions with native-born voters to call attention to the needs of immigrants (Bass and Casper 2001). Voting can then lead to economic benefits for immigrants and their communities.
- *Ability to petition for visas for immediate relatives without queuing:* Visas for immediate relatives petitioned for by US citizens are not subject to numerical caps and are granted with a minimal wait. Family members are instrumental in the economic integration of immigrants, pooling resources to get ahead and helping with the human capital investments of family members (Duleep 1998; Duleep and Regets 1996). The possibility of sponsoring the status adjustment of immediate relatives, such as one's wife, parents, or minor children, some of whom may be in temporary status or unauthorized, also gives peace of mind to naturalized citizens (Gonzalez and Consoli 2012), which could have a positive effect on productivity. Many

unauthorized immigrants co-reside with people of different immigration statuses (Enchautegui 2013), including naturalized citizens. The possibility of deportation of immediate relatives is a source of stress not only for unauthorized immigrants but also for their family members who are legally residing (Dreby 2012; Gonzalez and Consoli 2012).

- *Right to live in the United States:* Naturalization gives the immigrant the right to live in the United States. It protects naturalized citizens from deportation. The Illegal Immigration Reform and Immigration Responsibility Act of 1996 expanded the list of crimes for which legal permanent residents can be deported, elevating nonviolent, minor crimes to “aggravated felonies” triggering mandatory deportation (Hagan, Rodriguez, and Castro 2011).⁹ The Antiterrorism and Effective Death Penalty Act of 1996 increased the enforcement authority of the federal government by almost eliminating judicial review for most categories of immigrants subject to deportation (Hagan, Rodriguez, and Castro 2011). About 10 percent of all people deported every year are legal permanent residents, most of them deported for minor crimes.¹⁰ Naturalization gives a sense of permanency and belonging that can promote long-term investments such as buying a house, setting up a business, and investing in US-specific human capital (Bratsberg, Ragan, and Nasir 2002). Financial opportunities may also open up as banks may be more willing to lend to persons they perceive are attached to the US through citizenship.

Previous Work about the Economic Benefits of Naturalization

Despite its importance in the integration process, little work has been done on the economic effects of naturalization in the United States. An early study using data from the 1970 Census found no difference in earnings between naturalized citizens and nonnaturalized immigrants when accounting for the number of years residing in the United States (Chiswick 1978). The author concluded that the higher earnings of citizens can be explained by their longer tenure in the country. Shierholz (2010) reported that the family incomes of naturalized citizens are 14 percent higher than those of noncitizens, controlling for personal characteristics.

Bratsberg, Ragan, and Nasir (2002) warned about self-selection in the decision to naturalize and its impact on the estimates of the effects of naturalization. Individuals who decide to naturalize may have different unmeasured productivity than immigrants who do not naturalize, and their higher earnings

need not be attributed to naturalization. Estimates of the economic returns to naturalization should consider this self-selection. Bratsberg, Ragan, and Nasir used 1979–91 data from the 1979 National Longitudinal Survey of Youth. Those youth were ages 14 to 22 in 1979. They found that naturalization increased men’s hourly wages 5.6 percent. This effect is similar to that reported by the same authors using cross-sectional data from the 1990 census.

Pastor and Scoggins (2012) used 2010 ACS data to estimate the effects of naturalization on wages taking no account of self-selection. They found that naturalization increases annual earnings between 6 and 14 percent, depending on the demographic group. The authors estimated that these increases in earnings lead to a \$21 billion to \$45 billion increase in cumulative earnings over 10 years, depending on how the increases in naturalization roll out over time.

Our study uses a quasi-experimental methodology to estimate the economic returns to naturalization in ways that account for self-selection. We look at a broader set of outcomes than previous research and thoroughly impute immigration status to produce the best estimate possible of the population eligible to naturalize.

Methodology

We use the combined files from 2011 to 2013 ACS to obtain a sufficiently large sample size for the 21 cities to precisely estimate the effects of naturalization in those cities. We use the version of the ACS data provided by the Integrated Public Use Microdata Series (IPUMS) project (Ruggles et al. 2010). The basic analytical sample is composed of naturalized and eligible to naturalize people ages 18 and older.

The method used also takes great care in determining who is eligible to naturalize. It begins by imputing unauthorized and nonimmigrant status and taking those people out of the pool of the eligible to naturalize. Then we go through the rules for becoming a US citizen. To impute immigration status, we use the residual method. The Urban Institute has used this method for almost two decades to impute immigration status for use in TRIM3. This method closely resembles Passel and Clark’s methodology (Passel and Cohn 2009; Passel and Clark 1997; Passel, Van Hook, and Bean 2004). Appendix A includes a detailed description of the imputation method of unauthorized and nonimmigrant statuses.

We use a PSM methodology to estimate the effects of naturalization on economic outcomes, taking into consideration that individuals make choices about naturalization based on perceived economic gains. In this quasi-experimental method, some people receive the treatment (are naturalized) and

others do not (are not naturalized but are eligible to do so). The PSM methodology uses sophisticated statistical techniques to match a person who is naturalized to a person who is not naturalized but has similar characteristics based on a model of the probability of being a naturalized citizen. After matching, the difference in the outcomes between the matched naturalized and nonnaturalized groups can be interpreted as the effect of naturalization. PSM produces estimates of the effects of naturalization on those who are naturalized and on those who are eligible but not naturalized. The goal is to learn the effect of naturalization on those eligible to naturalize. Various methods have been developed to perform the matching. Our estimates use four different matching techniques. Details about the matching techniques can be found in appendix A.

We use PSM estimates of the effects of naturalization on individual earnings and employment to simulate earnings increases for each city, the tax revenues brought about by such increases, and the effects on government benefits for the cities of New York and San Francisco. These simulations are performed with a version of TRIM3 that operates on data from the ACS. TRIM3 is a highly developed, comprehensive model that has been used for more than 40 years to study programs affecting US households.¹¹ The simulation model applies the rules of each government tax and benefit program to each household in the survey data, one at a time. For example, a family's level of SNAP benefits (which is not included in the survey) is simulated by following the same steps that would be followed by a caseworker to compute benefits. This process was followed for each of the seven key benefit programs—SSI, TANF, SNAP, LIHEAP, WIC, subsidized housing, and subsidized child care—as well as for payroll taxes and for income taxes paid at the federal, state, and city levels. The simulations also imputed the child care expenses paid by families without a child care subsidy. The simulations are internally consistent; for example, the amount of child care expense that is assigned by the model is used in computing SNAP benefits (because the SNAP benefit formula uses a child care expense deduction) and in computing the child and dependent care tax credit for federal income taxes. The simulations of benefit programs are aligned so the simulated caseloads and benefits come as close as possible to actual levels, and all simulation results are validated against administrative data.¹²

City of residence is one of the geographical variables available in the ACS. All cities except Atlanta, Georgia; Chattanooga, Tennessee; Dallas, Texas; Houston, Texas; San Jose, California; and Reading, Pennsylvania, can easily be identified through the city codes of the ACS microdata. To identify the population residing in the cities with no city identification code, we use the Public Use Microdata Areas (PUMAs) corresponding to these cities. PUMAs are statistical geographic areas defined for the determination of the Public Use Microdata Sample data of the ACS. Although we tried to match as best we could the boundaries of the PUMAs with the boundaries of the city, they do not always match

exactly. Our use of PUMAs matched closely the census-reported population for most cities except Reading. Reading is contained within a single PUMA that contains a larger area than Reading. Our figures for Reading thus refer to a greater Reading area.

Appendix B shows unweighted sample sizes for the naturalized and eligible to naturalize population ages 18 and older in each city. The smallest sample size is 294 for Chattanooga, followed by 387 for Reading. Data for these cities must be interpreted with caution because sample sizes are small.

Estimates of the Population Eligible to Naturalize

Table 1 shows estimates of the number of immigrants who are eligible to naturalize for each of the 21 focus cities. In the 21 cities, close to 1.9 million foreign-born people of all ages are estimated to be eligible to naturalize. Of the foreign-born population, 23 percent is eligible to naturalize. New York, with 647,000, and Los Angeles, with 401,000, have the largest number of naturalization-eligible immigrants among the 21 cities.¹³ Los Angeles, Miami, and Washington, DC, have the highest share of naturalization-eligible people within their foreign-born populations. In each of these cities, 27 percent of the immigrants are eligible to naturalize. In Atlanta, by contrast, only 13 percent of the foreign-born population is eligible to naturalize.

Figure 1 shows the naturalization rate, defined as the ratio of those naturalized to the sum of the naturalized and those eligible to naturalize. In the United States as a whole, the naturalization rate is 60 percent, based on figures from the Department of Homeland Security for 2012. In the focus cities, 64 percent is naturalized. Dallas and Houston have the lowest naturalization rates, between 35 and 45 percent. San Francisco does best in terms of naturalization at 75 percent.

TABLE 1

Foreign-Born Population and Naturalization Status*21 Focus Cities, 2011–13, All Ages*

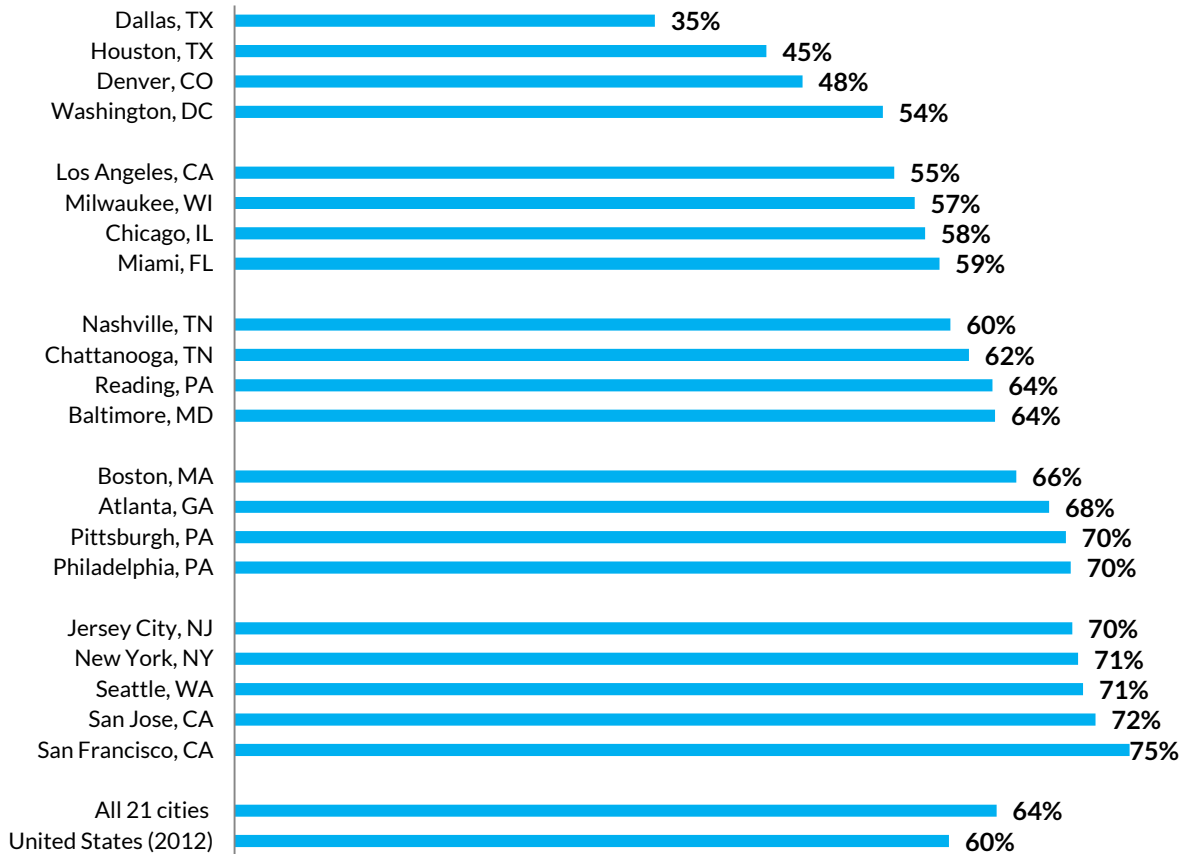
	Percentage of foreign born in the total population	All foreign born	Naturalized citizens	Eligible to naturalize	Percentage of foreign born who are eligible to naturalize
Atlanta, GA	8	34,385	9,418	4,350	13
Baltimore, MD	8	44,830	15,867	8,975	20
Boston, MA	27	162,053	69,788	36,512	23
Chattanooga, TN	6	11,604	3,173	1,972	17
Chicago, IL	21	553,650	185,026	134,001	24
Dallas, TX	24	332,425	48,851	89,564	27
Denver, CO	16	106,487	25,008	27,411	26
Houston, TX	28	659,539	140,937	174,570	26
Jersey City, NJ	40	99,499	41,346	17,419	18
Los Angeles, CA	39	1,473,424	499,280	401,866	27
Miami, FL	58	238,133	93,038	64,110	27
Milwaukee, WI	10	56,247	15,023	11,278	20
Nashville, TN	12	73,279	21,700	14,393	20
New York, NY	38	3,076,216	1,571,331	646,691	21
Philadelphia, PA	13	189,335	91,711	38,873	21
Pittsburgh, PA	8	22,597	8,508	3,677	16
Reading, PA	12	19,806	6,029	3,442	17
San Francisco, CA	36	289,866	166,435	54,961	19
San Jose, CA	39	418,217	217,380	83,256	20
Seattle, WA	18	111,773	56,171	22,648	20
Washington, DC	15	86,130	28,162	23,561	27
All 21 cities	29	8,059,495	3,314,183	1,863,530	23
United States (2012)	13	40,738,224	13,300,000	8,770,000	22

Notes: Data for the United States are from ACS 2012. Estimates of the naturalized and eligible to naturalize are from Department of Homeland Security, “Estimates of the Legal Permanent Resident Population in 2012,” http://www.dhs.gov/sites/default/files/publications/ois_lpr_pe_2012.pdf.

FIGURE 1

Naturalization Rate

21 Focus Cities, 2011–13



Note: Naturalization rate is the ratio of the number of naturalized citizens to the sum of those naturalized and eligible to naturalize.

Characteristics of the Population Eligible to Naturalize

Knowledge of the characteristics of the population eligible to naturalize can be used to guide approaches to promote naturalization. Table 2 shows their countries or regions of origin and table 3 shows educational levels, English proficiency, and income levels for the adult population eligible to naturalize. *Limited English proficiency* is defined as not speaking English at all or speaking English but not well.

Mexico, the country of origin of the largest number of immigrants in the United States, is the top country of origin of the naturalization-eligible population in 10 of the 21 focus cities. In Boston, New

York, and Reading, the top nationality of those eligible to naturalize is Dominican. In Jersey City most of the people eligible to naturalize are from India, and in San Francisco they are from China.

The city with the highest educational attainment among those eligible to naturalize is Pittsburgh, where 54 percent have at least two years of college education. Seattle follows with 49 percent. However, in Dallas, Houston, Milwaukee, and Reading, only between 9 and 15 percent of the people eligible to naturalize have two years or more of college education.

In the 21 cities combined, 37 percent of the eligible-to-naturalize population has limited English proficiency. The city with the highest percentage of limited English proficiency among the population eligible to naturalize is Miami, with over half. Baltimore and Pittsburgh have the most English proficient eligible-to-naturalize populations.

The last column of table 3 shows the percentage with incomes at or under 150 percent of the federal poverty level (FPL). Naturalization applicants with income up to 150 percent of FPL are eligible for a fee waiver by the US Citizenship and Immigration Services.¹⁴ In Milwaukee and Miami, over 40 percent of those eligible to naturalize have income only up to 150 percent of FPL, the highest in the 21 cities considered. In Seattle and San Jose, the share with incomes below 150 percent of FPL is near 20 percent, the lowest among the 21 cities considered. In the 21 cities combined, 33 percent of those eligible to naturalize have incomes up to 150 percent of FPL and thus are likely eligible for a fee waiver.

TABLE 2

**Top Three Countries or Regions of Origin of the Adult Population Eligible to Naturalize
21 Focus Cities, 2011–13**

	First	Second	Third
Atlanta, GA	Mexico	West Indies	Africa
Baltimore, MD	Africa	West Indies	Central America
Boston, MA	Dominican Republic	Haiti	China
Chattanooga, TN	Central America	India	Canada
Chicago, IL	Mexico	Poland	China
Dallas, TX	Mexico	El Salvador	Guatemala
Denver, CO	Mexico	Africa	Central America
Houston, TX	Mexico	El Salvador	Honduras
Jersey City, NJ	India	Africa	Philippines
Los Angeles, CA	Mexico	El Salvador	Guatemala
Miami, FL	Mexico	El Salvador	Guatemala
Milwaukee, WI	Mexico	Africa	Laos
Nashville, TN	Mexico	Africa	Central America
New York, NY	Dominican Republic	Mexico	China
Philadelphia, PA	West Indies	Africa	China
Pittsburgh, PA	Africa	Poland	India
Reading, PA	Dominican Republic	Mexico	Guatemala
San Jose, CA	Mexico	Vietnam	India
San Francisco, CA	China	Mexico	Philippines
Seattle, WA	Africa	China	Canada
Washington, DC	Central America	Mexico	Canada
All 21 cities	Mexico	Dominican Republic	El Salvador

Note: Regions are used when sample sizes are small.

TABLE 3

Socioeconomic Characteristics of Those Eligible to Naturalize (percentage)*21 Focus Cities, 2011–13, Adult Population*

	Two years of college or more	Limited English proficiency	Income at or under 150 percent of the federal poverty level
Atlanta, GA	48	17	38
Baltimore, MD	36	14	36
Boston, MA	24	35	32
Chattanooga, TN	32	29	33
Chicago, IL	21	41	35
Dallas, TX	10	47	37
Denver, CO	20	34	29
Houston, TX	15	45	36
Jersey City, NJ	41	22	28
Los Angeles, CA	18	43	36
Miami, FL	18	51	44
Milwaukee, WI	15	31	45
Nashville, TN	27	17	30
New York, NY	24	34	32
Philadelphia, PA	23	34	39
Pittsburgh, PA	54	14	33
Reading, PA	9	28	37
San Francisco, CA	37	33	22
San Jose, CA	32	32	21
Seattle, WA	49	20	20
Washington, DC	48	18	26
All 21 cities	23	37	33

Individual-Level Impact

Naturalized citizens have higher mean annual wages and annual earnings than those eligible to naturalize. *Wages* refers to income from wages and salaries; *earnings* includes both wages and salaries as well as income earned through self-employment. Naturalized citizens also have higher employment and homeownership rates than those eligible to naturalize (figure 2). Also, those eligible to naturalize are more likely to participate in government benefits. These differences could be caused by differences between the two groups in characteristics, such as age, education, and years in the United States, and by self-selection in the decision to naturalize: those who naturalize may differ in difficult-to-measure characteristics that affect both the decision to naturalize and economic outcomes. The PSM methodology accounts for these factors.

Using the PSM methodology, we estimate the effects of naturalization on wages, earnings, employment, self-employment, homeownership, and participation in government benefit programs. In the first step of the matching process we predict the chances that a person is naturalized based on gender, years in the United States, age at arrival, region of origin, presence of undocumented people in the household, and percentage of the city that is foreign born. Results of the model of the likelihood of naturalization appear in appendix C.

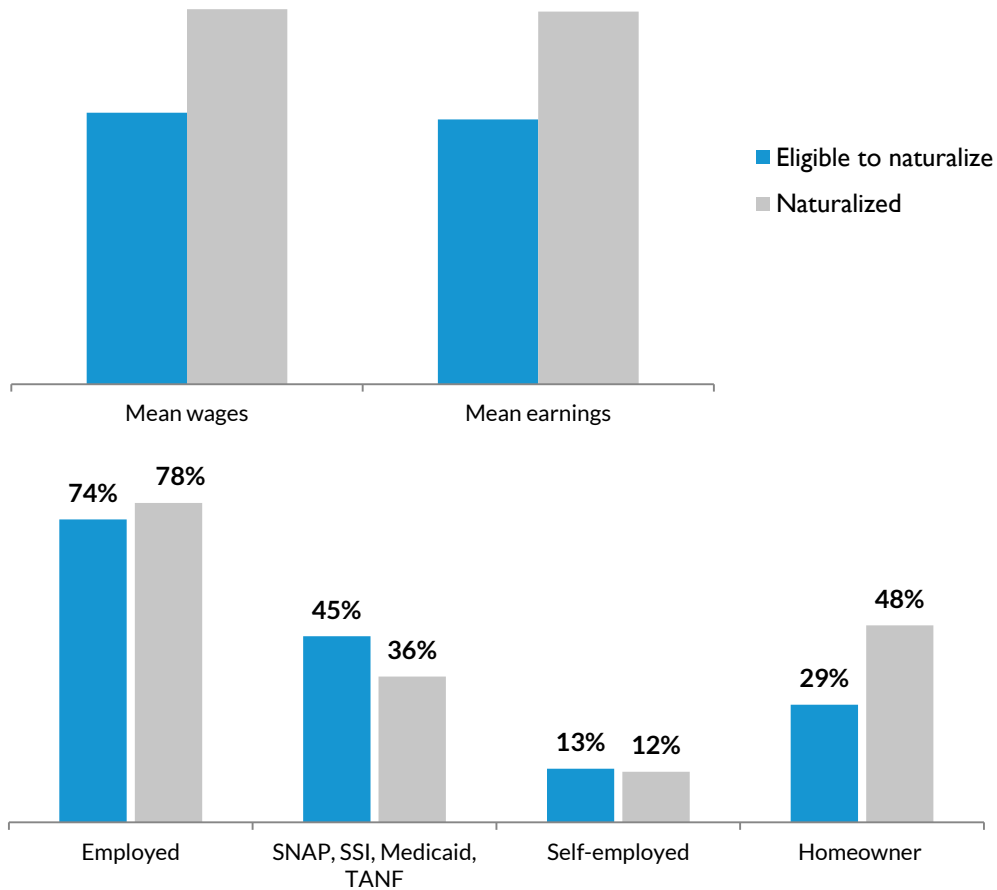
Predictions of the likelihood of naturalization based on the model shown in appendix C are used to match naturalized citizens to comparison noncitizens eligible to naturalize using four different matching techniques. Results of the matching are shown in appendix D. We are interested in assessing how naturalization would affect the outcomes of those who are not naturalized but eligible to do so.

The choice of matching technique does not substantially change the impacts of naturalization. In addition, effects are larger for those already naturalized, thus suggesting self-selection on the decision to naturalize. Using the three-nearest-neighbors technique, which is commonly used in this type of analysis, we find that naturalization increases the earnings of those eligible to naturalize 8.9 percent (figure 3). This increase means that the earnings of those who become citizens will be 8.9 percent higher than their earnings if they were not naturalized. For example, in 2011–13, those who are naturalized will have earnings that are \$3,200 higher than if they were not naturalized, bringing their earnings from about \$36,300 to \$39,500.

FIGURE 2

Economic Outcomes by Naturalization Status

21 Focus Cities, ACS 2011-13



Notes: Ages 18 and older. Employment rates are for people ages 18 to 64. Estimates are weighted. TANF could include other cash assistance.

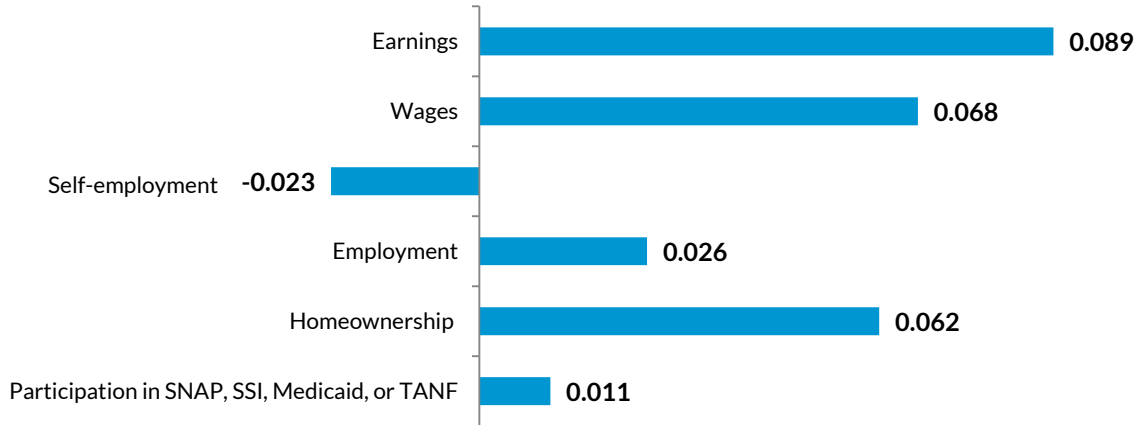
The earning impacts are larger than the wage impacts. This may be because naturalization opens up financial and market opportunities for the self-employed that have a large impact on earnings.

The impact of naturalization on the wages of the eligible to naturalize is around 6 percent. Bratsberg, Ragan, and Nasir (2002) and Pastor and Scoggins (2012) report naturalization effects on hourly wages of close to 7 percent, but their figures are for the average naturalized and nonnaturalized combined, and they do not use PSM. Also, their sample may include some long-time residents who are nonimmigrants or undocumented.

FIGURE 3

Effects of Naturalization on the Eligible to Naturalize

21 Focus Cities



Notes: Effects using Propensity Score Matching Nearest Neighbor (3). Results for other matching techniques are shown in appendix D. Changes in employment, self-employment, homeownership, and government benefits refer to percentage point changes. Changes in earnings and wages refer to percent increase. All estimates are statistically significant at the .01 level.

Naturalization significantly affects homeownership. Using observations of heads of household, we estimate that if the eligible were to naturalize, their homeownership rate could increase 6 percentage points. This means that the homeownership rate could increase from 29 to 35 percent. We theorize that this effect is caused by two factors: the increase in earnings, which translates into a greater ability to afford down payments and mortgage payments, and a greater sense of belonging and permanency in the United States, which translates into a greater interest in settling in the United States in the long term. Similar to wages and earnings, the effects on those already naturalized are larger than the effects on those eligible to naturalize (see appendix D).

Naturalization could reduce self-employment by about 2 percentage points: naturalized citizens may opt for salaried work rather than self-employment as better job opportunities open up. This result is consistent with various studies showing that, other things constant, the self-employed have lower earnings than salaried workers and that some self-employment among immigrants is quite marginal and caused by limited employment opportunities in the labor market (Abada, Hou, and Lu 2014; Blume et al. 2009; Borjas 1986; Hamilton 2000; Lofstrom 2013; Menjivar and Enchautegui 2015; Spener and Bean 1999). This result does not necessarily contradict the finding that naturalization has higher effects in the earnings estimates, which include the self-employed, than in the wage estimates, which include only

wage and salaried workers. Those eligible to naturalize who remain self-employed apparently do better than salaried workers.

Employment effects are small, between a 2.2 and 2.7 percentage-point increase in the probability of employment for those eligible to naturalize. And, similar to the other outcomes, effects are larger for those already naturalized.

Last, we use PSM to estimate the effect of naturalization on the likelihood of using SNAP, SSI, Medicaid, or cash assistance (TANF). The effect of naturalization on the likelihood of using government benefits is about a 1 percentage-point increase. As was discussed, the program that is most affected by naturalization is SSI because citizens are not required to meet prior-work requirements. Eligibility aside, qualified citizens may feel freer to seek government assistance. These PSM estimations consider only the likelihood of receiving benefits, not the amount of benefits received. As discussed later, however, expenditures on government benefits may in fact shrink when looking at all major such programs' combined expenditures.

Aggregate Impacts of Naturalization on Earnings

We use 8.9 percent as our point estimate to simulate the change in aggregate earnings with increased naturalization. This estimate produced the best match in terms of the characteristics of those eligible to naturalize and the naturalized.¹⁵ We take the effect of naturalization on those eligible to naturalize to simulate the naturalization experiment, because we are interested in how the earnings of those who are not currently naturalized will change if they were to naturalize. The simulations use the earnings results rather than wages to consider the self-employed because self-employment is an important avenue of economic achievement among immigrants and a way immigrants contribute to the economy (Borjas 1986; Kallick 2015; Lofstrom 2002).

Simulations also assume that naturalization would increase the employment rate by 2.2 percentage points, as shown in appendix D. Those who gain employment are given the average earnings of those eligible to naturalize.¹⁶

Aggregate earnings gains for each one of the 21 cities and for all the cities combined are shown in table 4. The aggregate increase in earnings depends on how many of the naturalization-eligible citizens become naturalized. We present figures assuming that 100 percent, 60 percent, and 25 percent of

those eligible to naturalize actually naturalize. The 60 percent level was selected because it is the naturalization rate for the United States as a whole (table 1).

With an earnings effect of 8.9 percent, the aggregate earnings in the 21 cities will increase by \$5.7 billion if all the people eligible to naturalize do so. If only 60 percent naturalize (randomly among the eligible) the benefits will be \$3.4 billion. Earnings gains range from \$7 million in Chattanooga and Reading to over \$2 billion in New York.

TABLE 4

Aggregate Earnings Increase from Naturalization

21 Focus Cities (\$ in 2012 millions)

	Initial aggregate earnings	Earnings increase from naturalization if 100% of those eligible naturalize	Earnings increase from naturalization if 60% of those eligible naturalize	Earnings increase from naturalization if 25% of those eligible naturalize
Atlanta, GA	148	19	11	5
Baltimore, MD	237	24	14	6
Boston, MA	990	115	69	29
Chattanooga, TN	43	7	4	2
Chicago, IL	3,124	428	257	128
Dallas, TX	1,756	255	153	76
Denver, CO	590	60	36	18
Houston, TX	3,901	521	312	156
Jersey City, NJ	609	73	44	18
Los Angeles, CA	7,636	1,109	665	277
Miami, FL	1,062	137	82	34
Milwaukee, WI	195	28	17	7
Nashville, TN	296	54	33	14
New York, NY	15,460	2,011	1,207	503
Philadelphia, PA	621	111	66	28
Pittsburgh, PA	145	15	9	4
Reading, PA	52	7	4	2
San Francisco, CA	2,017	233	140	58
San Jose, CA	2,742	334	201	84
Seattle, WA	852	90	54	23
Washington, DC	1,048	95	57	24
All 21 cities	43,523	5,726	3,435	1,431

Notes: Assumes earnings increase 8.9 percent and employment rate increases 2.2 percentage points. See appendix D for more information.

Aggregate Impact of Naturalization on Homeownership

Results show that naturalization could significantly affect homeownership. To trace what this means in terms of new homeowners, table 5 shows the predicted increase in the number of homeowners owing to naturalization of those eligible to naturalize, based on our estimate of an increase of 6.3 percentage points in homeownership rate.¹⁷ Naturalization could produce 45,000 new homeowners if all naturalization-eligible heads of household naturalize.

TABLE 5

Impact of Naturalization on Homeownership

21 Focus Cities

	Initial homeownership rate of those eligible to naturalize (%)	Homeownership rate upon naturalization (%)	New homeowners if all eligible naturalize	New homeowners if 60% of those eligible naturalize	New homeowners if 25% of those eligible naturalize
Atlanta, GA	46	52	127	76	32
Baltimore, MD	35	42	253	152	63
Boston, MA	21	28	995	597	249
Chattanooga, TN	53	60	37	22	9
Chicago, IL	43	49	3,346	2,007	836
Dallas, TX	45	51	2,313	1,388	578
Denver, CO	41	47	670	402	168
Houston, TX	43	50	4,487	2,692	1,122
Jersey City, NJ	19	25	452	271	113
Los Angeles, CA	25	31	9,443	5,666	2,361
Miami, FL	21	27	1,670	1,002	417
Milwaukee, WI	44	50	298	179	74
Nashville, TN	40	46	322	193	80
New York, NY	19	25	15,497	9,298	3,874
Philadelphia, PA	42	48	920	552	230
Pittsburgh, PA	33	39	99	59	25
Reading, PA	42	48	90	54	23
San Francisco, CA	25	32	1,318	791	330
San Jose, CA	42	49	1,664	998	416
Seattle, WA	37	44	574	345	144
Washington, DC	34	40	659	396	165
All 21 cities	29	35	45,236	27,142	11,309

Notes: Assumes an increase of 6.3 percentage points in homeownership rate. Observations only of heads of households.

Impacts of Naturalization on Tax Revenues

Using the TRIM3 microsimulation model, we calculate the increase in tax revenues resulting from the increase in earnings for each one of the 21 focus cities (table 6).¹⁸ The taxes considered in the estimates are payroll (Social Security and Medicare) taxes and federal, state, and city income taxes. Sales taxes are not captured in our model. The payroll tax estimates include both the employer and employee portions. City taxes are included in the six cities that have income taxes: Baltimore, Denver, New York, Pittsburgh, Reading, and San Francisco. Denver's tax is on employment and San Francisco's is imposed on employers based on the payroll bill. For Seattle and Miami, all the increase in tax revenue is at the federal level because these cities are in states that do not impose state income taxes. Simulations of income taxes include simulation of tax credits such as the earned income tax credit (EITC).

The additional earnings resulting from naturalization could increase tax revenues by \$2.03 billion in the 21 cities combined if all those eligible to do so naturalize. The estimate falls to \$740 million if only 60 percent of those eligible naturalize. In New York, the increase in taxes could be \$789 million. San Francisco could see an increase in income tax revenues of \$90 million. Relative to the current tax revenues, the naturalization of those eligible to naturalize could increase overall tax revenues between 1 and 2 percent, depending on the city.

TABLE 6

Change in Tax Revenues from Increased Earnings after Naturalization*21 Focus Cities (\$ in 2012 millions)*

	If all eligible naturalize	If 60% of those eligible naturalize	If 25% of those eligible naturalize
Atlanta, GA	7.02	4.21	1.76
Baltimore, MD	9.32	5.59	2.33
Boston, MA	41.07	24.64	10.27
Chattanooga, TN	1.89	1.13	0.47
Chicago, IL	151.59	90.96	37.90
Dallas, TX	75.52	45.31	18.88
Denver, CO	20.77	12.46	5.19
Houston, TX	155.03	93.02	38.76
Jersey City, NJ	25.51	15.30	6.38
Los Angeles, CA	364.48	218.69	91.12
Miami, FL	40.80	24.48	10.20
Milwaukee, WI	9.08	5.45	2.27
Nashville, TN	15.29	9.17	3.82
New York, NY	789.00	473.40	197.25
Philadelphia, PA	37.10	22.26	9.28
Pittsburgh, PA	5.81	3.48	1.45
Reading, PA	2.28	1.37	0.57
San Francisco, CA	90.13	52.19	21.75
San Jose, CA	123.13	73.88	30.78
Seattle, WA	29.72	17.83	7.43
Washington, DC	39.37	23.62	9.84
All 21 cities	2,030.77	1,218.46	507.69

Notes: Includes only payroll taxes and federal, state, and city income taxes. Assumes 8.9 percent increase in earnings and 2.2 percentage-point increase in employment.

Impacts of Naturalization on Use of Government Benefits: Focus on New York and San Francisco

In this section we estimate the effects of naturalization on government benefits in New York and San Francisco, using the TRIM3 microsimulation model. Benefits analysis has to be done city by city because eligibility and benefits for some programs vary by state, and program participation in the ACS has to be

calibrated to city administrative data. Results for New York and San Francisco are not necessarily generalizable to other cities but can highlight key elements to keep in mind when trying to assess the effects of naturalization on government benefit use and expenditures.

Our analysis simulates changes in Supplemental Security Income (SSI), Temporary Assistance for Needy Families (TANF), the Supplemental Nutrition Assistance Program (SNAP, also known as food stamps), subsidized child care (Child Care Development Fund subsidies), subsidized housing, the Low Income Home Energy Assistance Program (LIHEAP), and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Table 7 shows the simulation results for New York and includes tax changes to illustrate the whole picture of the effects of naturalization. Changes in government benefits come from increased earnings, and changes in eligibility from becoming a citizen. Some households may no longer be eligible for SNAP and other government programs with the earnings increase, and others will receive lower benefits. In the case of SSI, becoming a citizen can make some of the new citizens eligible.

In New York the annual costs of government benefits combined are estimated to decline \$38 million if all naturalization-eligible residents naturalize. The largest decline is in the costs of housing programs and SNAP, which are expected to drop \$35 million and \$47 million, respectively. The only program showing an increase is SSI. Costs for this program are predicted to increase \$59 million, reflecting that some of the newly naturalized people become eligible for this program. Increase in income from SSI can in turn reduce the amount of other government benefits for which a person may be eligible, such as SNAP or TANF (cash assistance). The microsimulations consider these interrelationships in the use of government benefits and amount received. These interactions can explain part of the decline in expenditures in shown in table 7.

We find that in New York, naturalization decreases the costs of government programs in the aggregate. When the figures for government benefits are combined with the figures on increased tax revenues, the net fiscal impact in the city of New York is positive, representing a win on all accounts: more earnings, more tax revenues, and less expenditure on government benefits. Government benefit expenditures decline \$34 million for a net fiscal gain of \$823 million.

TABLE 7

Effects of Naturalization on Government Benefits and Tax Revenues in New York City

(\$ in 2012 millions)

	If 100% of those eligible naturalize	If 60% of those eligible naturalize	If 25% of those eligible naturalize
Government benefits	-\$34	-\$20	-\$8
SSI	59	\$35	\$15
TANF	-8	-\$5	-\$2
CCDF subsidies	-2	-\$1	-\$0.4
Housing	-35	-\$21	-\$9
SNAP	-47	-\$28	-\$12
LIHEAP	0	\$0	\$0
WIC	-1	-\$0.6	-\$0.25
Tax revenues	\$789	\$473	\$197
<i>Federal taxes</i>	\$597	\$358	\$149
Payroll tax	\$225	\$135	\$56
Federal income tax	\$372	\$223	\$93
<i>State income taxes</i>	\$124	\$74	\$31
<i>City income tax</i>	\$68	\$41	\$17
Aggregate changes			
Government benefits	-\$34	-\$20	-\$8
Tax revenues	\$789	\$473	\$197
Net benefits	\$823	\$494	\$206
Number naturalizing, age 18 or older (thousands)	609	365	152

Notes: All naturalization-eligible people who have earnings (including self-employment) get an increase of 8.9 percent. People with a chance of a new job are those who are naturalization-eligible, 18-64, not a student, not disabled, and not retired. All new jobs are 52 weeks, 40 hours/week, \$22.71 hourly wage. Number of new jobs equals about 2 percent of naturalization-eligible adults. Benefit figures include adults with no earnings. TANF includes state-funded "safety net" benefits.

San Francisco shows a different pattern. There, expenditures in all programs except SSI decrease about \$1 to \$2 million, but SSI increases \$9 million, for a total increase in government benefit expenditures of \$4 million. Even considering the increase in government benefit expenditures, there is still a net fiscal gain of \$86 million.

San Francisco has a larger share than New York City of naturalization-eligible immigrants age 65 and older: 14 and 11 percent, respectively. Immigrants who arrive to the US at an old age may not have time to accumulate the quarters of work necessary to get social security or SSI.¹⁹ Some of these immigrants become eligible for SSI upon becoming a citizen.

TABLE 8

Effects of Naturalization on Government Benefits and Tax Revenues in San Francisco

(\$ in 2012 millions)

	If 100% of those eligible naturalize	If 60% of those eligible naturalize	If 25% of those eligible naturalize
Government benefits	4	2.4	1.0
SSI	9	5.4	2.3
TANF	-1	-0.6	-0.3
CCDF subsidies	-1	-0.6	-0.3
Housing	-2	-1.2	-0.5
SNAP	-1	-0.6	-0.3
LIHEAP	0	0.0	0.0
WIC	0	0.0	0.0
Tax revenues	90	54	23
<i>Federal taxes</i>	73	44	26
Payroll tax	23	14	8
Federal income tax	50	30	18
<i>State income taxes</i>	16	10	6
<i>City income tax</i>	1.09	0.7	0.4
Aggregate changes			
Government benefits	4	2.4	1.4
Tax liabilities	90	54.1	32.4
Net benefits	86	51.7	31.0
Number naturalizing age 18 or older (thousands)	53	32	19

Notes: All naturalization-eligible people who have earnings (including self-employment) get an increase of 8.9 percent. People with a chance of a new job are those who are naturalization-eligible, 18-64, not a student, not disabled, and not retired. All new jobs are 52 weeks, 40 hours/week, \$22.71 hourly wage. Number of new jobs equals about 2 percent of naturalization-eligible adults. TANF includes state-funded "safety net" benefits.

Concluding Remarks

This study estimates the economic effects of naturalization in 21 American cities. We find that if the people eligible to naturalize in those cities become citizens, aggregate earnings could increase by \$5.7 billion. If only 60 percent of all those who are eligible become citizens, earnings could increase by \$3.4 billion. Naturalization of those eligible to become citizens is estimated to lead to over \$2 billion in additional payroll taxes and federal, state, and city income taxes. We find that naturalization could generate 45,000 new homeowners. In addition, a detailed analysis for two cities shows that naturalization may reduce expenditures for government benefits. For instance, our tax and government

benefit analysis for New York reveals that naturalization could increase tax revenues \$789 million and reduce the cost of government benefits \$34 million. In San Francisco, government expenditures could increase \$4 million, but the net fiscal gain is still overwhelmingly positive.

These results add to our knowledge of the impact of naturalization in three ways. First, this is the first study to our knowledge that comprehensively assesses the economic effects of naturalization in a large set of localities. Contrary to previous studies of economic effects of immigration, which focus on earnings and at times on taxes, we present a complete view of effects by assessing a wider range of outcomes and the impacts on government benefits. Thus, our analysis presents a view of the net fiscal impacts of naturalization, indicating that naturalization's earning effects are a powerful antipoverty and economic development intervention and an untapped source of tax revenue for governments. Second, this study suggests that naturalization is unlikely to be a drain on government benefits. Even in San Francisco, a city with a higher share of older adults than several of the other cities, naturalization of those eligible increased government expenditures only \$4 million. Further research is needed to determine whether this outcome would be true in the United States as a whole and for other cities, because states have put in place different eligibility requirements for SNAP, TANF, and other programs. Third, this study shows that the benefits of naturalization on homeownership are substantial.

These results demonstrate that the ultimate extent of the economic benefits of naturalization depends on how many people take advantage of the opportunity to naturalize. This finding raises the issue of the availability and effectiveness of naturalization-promoting programs and resources. Several cities have launched naturalization-promotion programs to assist eligible immigrants through the process. In 2014, three such cities—Chicago, Los Angeles, and New York, with support from the Center for Popular Democracy, the National Partnership for New Americans, and Citi Community Development—launched Cities for Citizenship, a major national initiative aimed at increasing citizenship among eligible US permanent residents and encouraging cities across the country to invest in citizenship programs. Although our study has found evidence of naturalization's benefits, and many more cities are now actively involved in promoting naturalization to their residents, a lack of knowledge about what works best in promoting naturalization remains. Some programs focus on English language and civic learning because naturalization generally requires that applicants pass an interview and a US history or civics exam, both of which are typically in English. Other programs have focused on financial assistance, helping immigrants with the payment of the \$680 application fee. One-third of naturalization-eligible individuals have incomes below 150 percent of FPL, suggesting that the fee could be deterring some from naturalizing and that applicants could benefit from financial empowerment services, which are integrated into some citizenship programs, and from more outreach regarding

waivers. Other programs have focused on increasing awareness of the benefits of naturalization, educating immigrants about their eligibility, and reducing misinformation about citizenship requirements. More evidence is needed on what programs are effective, on what populations they work best for, and what conditions could make these programs work better.

The effectiveness of naturalization programs also affects how quickly the economic gains of naturalization materialize. Our economic impact analysis estimates that naturalization produces an increase in earnings of 8.9 percent. The materialization of these aggregate effects is a function of how quickly and to what scale naturalization can be increased among those eligible to naturalize. A goal of naturalizing 60 percent of the eligible in three years, for instance, would mean that the benefits of naturalization evaluated at 60 percent will be rolled out in a period of three years. The more effective programs are at increasing the number of naturalized citizens, the more quickly the benefits of naturalization will be felt by individuals and the cities in which they live.

Knowledge of the characteristics of the local population is fundamental in designing effective naturalization-promoting programs. Characteristics such as the country of origin, English-language proficiency, educational achievement, and income levels of the local population provide guidance about what programs could be more effective, what populations to target, and what naturalization-rate goals are appropriate.

Appendix A. Detailed Methodology

Assignment of immigration status: To know the number of people eligible to naturalize, we have to know the immigration status of the foreign-born people in the ACS. The eligible to naturalize are part of the immigrant population with legal permanent residence status, but the only information in the ACS pertaining to immigration status is whether or not the foreign-born person is a naturalized citizen. Whether the non-naturalized are lawful permanent residents, refugees, nonimmigrants with temporary residence status, or unauthorized is not known. To determine whether an immigrant is eligible to naturalize, we first impute immigration status. Then, of those whose imputed status is legal permanent resident, we identify those who are eligible to naturalize based on years of residence in the United States, marriage to a US citizen, age (whether under age 18 or not), and military service.

The procedure starts by determining the definitely legal population among the noncitizens. This population is composed of immigrants whose occupations and sources of income suggest they are legally residing in the United States. For instance, a foreign-born person who receives Social Security or who is a policeman is almost certain to be a legal resident. We also identify people from refugee countries based on the country of birth and year of arrival, based on information on annual refugee admissions from Department of State memos and data on annual refugee admissions from the Department of Homeland Security. Temporary status immigrants are identified by occupation, country of birth, and student status. After these assignments have been made, immigrants in the residual group are assigned as unauthorized.

Adjustment for misreported citizenship: Studies of immigration status imputations have noticed that some immigrants appear to be misreporting their citizenship (Van Hook and Bachmeier 2013). One indication of misreporting is that a share of recently arrived immigrants claim to be naturalized citizens. Imputations by Passel and Cohn (2009) and Warren (2014) adjust for misreported citizenship. Van Hook and Bachmeier (2013) also recommend adjustment. We adjust for misreported citizenship by submitting all immigrants who say they are citizens and have resided in the United States for less than five years to the imputation procedure if they do not appear to meet the citizenship rules for people with less than five years of US residence. Similar to Passel and Clark (1997), we also subject all Mexicans and Central Americans who say they are citizens to the imputation procedure and return them to the naturalized citizenship category if they are not assigned to be unauthorized immigrants.

Calibration of imputations: The assignment of unauthorized status is calibrated to published estimates of the unauthorized population in 2012 in the 15 states that contain the 21 focus cities. Calibration to the unauthorized was necessary because publicly available estimates for 2012 of the legal permanent residents in these 15 states do not exist. We used estimates of the unauthorized population published by the Center for Migration Studies (n.d.), which were developed by Warren (2014) as targets. These targets were

selected because they coincide for the middle year of our data and had information for the 12 states that include the focus cities. In calibrating the estimates, we allowed our unauthorized count to be up to 8 percent lower than the Center for Migration Studies estimates, because the Center for Migration Studies estimates are adjusted for undercount of the unauthorized and ours are not.²⁰ It was important to not overidentify unauthorized immigrants in our data, in order to avoid underidentifying the legal permanent resident category. After a second round of reassignments using probabilities of unauthorized status based on gender, country of origin, age, and education (based on prior Urban Institute estimates), we achieved counts that were within 5 percent of the targets for the 15 states; most of the estimates were within 98 percent of targets.

Identification of the population eligible to naturalize: The main factors determining whether a person is eligible or not to naturalize are immigration status, years the immigrant has been a legal permanent resident, age of the person (whether or not a minor), citizenship status of the spouse and years married, military service, and age and status of the parents for minor children. A person who is a legal permanent resident and who has resided in the United States for at least five years with that status is generally eligible to naturalize. Also eligible are people who entered as refugees and who have resided in the United States for at least one year. Legal permanent residents currently serving in the military or who have served in the military, as well as spouses and children of current or prior service members, are eligible to naturalize without any waiting period. Immigrants who have been married to US citizens for at least three years and have been legal permanent residents for at least that same number of years are also eligible to become citizens. Finally, children of US citizens are generally eligible to naturalize. The ACS does not contain all the information necessary to know with precision whether or not a person is eligible to naturalize, but we can get a close estimate based on age, marital status, years in the United States, spouse's citizenship, and military service.

Estimating the effects of citizenship on economic outcomes: We use a PSM methodology to estimate the impacts of naturalization on earnings, employment, self-employment, homeownership, and government benefits. This methodology has been widely used to assess the impact of an intervention when a random control experiment is not possible (Caliendo and Kopeinig 2005; Peikes, Moreno, and Orzol 2008; Thoemmes and Kim 2011). Naturalization could be seen as an intervention where the treated group is composed of the naturalized citizens and the untreated group comprises the noncitizens who are eligible to naturalize. PSM is particularly well suited to this analysis because the goal is to estimate the effect of naturalization if the non-naturalized were to become citizens. This technique also provides information about the effect of naturalization on those who are naturalized and the average treatment effect, combining both groups. Matching by propensity score attempts to control for factors that relate to selection bias or the possibility that those who become citizens are those who can get the most benefits from it (Anderson 2014; Brastberg, Ragan, and Nasir 2002).

The PSM procedure matches a naturalized citizen to a noncitizen based on a propensity score generated by a model of the decision to naturalize. We use a logit model of naturalization that predicts probability to naturalize or not on the basis of certain covariates. Various techniques exist to conduct the matching. The nearest-neighbor technique matches the citizen with the noncitizen with the closest propensity score. The nearest-neighbor procedure can use more than one comparison observation instead of only one. Kernel density is another matching technique. This technique compares each treatment group observation with all, or many, members of the comparison group, weighted by proximity of propensity score. The kernel matching can be done with a bandwidth in which only observations within a certain propensity score are used. To increase the quality of the matches, we specify that the distance in the propensity score between the naturalized and non-naturalized by eligible be kept within a certain range by specifying a caliper of 0.03. We also specified that the matches be kept within a common support; that is, matches must be inside the common portion of the distribution of the propensity score of both the treated and the nontreated group. In addition we compared the means of the covariates for the treatment and the control group, calculating the mean bias and favoring the matching technique that produces differences below 5 percent.

After the naturalized and the appropriate nonnaturalized matches are determined, the impact of naturalization is obtained by comparing the outcome variables of the naturalized and the matched nonnaturalized but eligible people.

Appendix B. Naturalized and Eligible to Naturalize Population Sample Sizes

TABLE B.1

Sample Sizes from American Community Survey 2011–13

21 Focus Cities, Naturalized and Eligible to Naturalize, Age 18 and older

Atlanta, GA	436
Baltimore, MD	729
Boston, MA	2,952
Chattanooga, TN	114
Chicago, IL	7,558
Dallas, TX	3,779
Houston, TX	7,930
Jersey City, NJ	1,565
Los Angeles, CA	27,972
Miami, FL	4,219
Milwaukee, WI	503
Nashville, TN	873
New York, NY	55,496
Philadelphia, PA	2,230
Pittsburgh, PA	282
Reading, PA	190
San Francisco, CA	6,029
San Jose, CA	9,472
Seattle, WA	1,840
Washington, DC	1,399
All 21 cities	136,728

Note: Figures for Atlanta, Chattanooga, Dallas, Houston, Reading, and San Jose are estimates based on PUMAs because these cities are not identified in the Public Use Microdata Samples of ACS.

Appendix C. Logit Model of Naturalization Used in PSM

TABLE C.1

Logit Model of Naturalization

Persons with earnings only

	Coefficient	Standard error	z	P> z
Female	0.239	0.017	14.36	0
Age at arrival	0.008	0.001	10.08	0
Years in the United States	0.090	0.001	93.73	0
Education 0–11 years	-0.712	0.023	-30.49	0
Two years or more of college	0.345	0.019	18.08	0
Asian	0.355	0.021	16.56	0
Latino	-1.421	0.022	-65.43	0
Foreign-born in the city	0.000	0.000	22.68	0
Undocumented immigrant in the household	0.103	0.031	3.32	0.001
Constant	-1.478	0.039	-37.66	0

Notes: These results are intended to illustrate the logit models of naturalization using the PMS estimations. This model refers only to the earnings results and includes only persons with earnings. The population included in each PMS outcome varies, and the logit results vary.

Appendix D. PSM Estimates of the Effects of Naturalization on Economic Outcomes

TABLE D.1

PSM Estimates of the Effects of Naturalization on Economic Outcomes

	Difference nearest neighbor	Difference nearest neighbor-3	Kernel	Difference using kernel with bandwidth
Annual earnings (raw log difference naturalized-naturalized eligible = .37)				
On the eligible to naturalize	0.089	0.089	0.105	0.082
On the naturalized	0.142	0.136	0.137	0.134
On the average person	0.124	0.12	0.126	0.116
Annual wages (raw log difference naturalized-naturalized eligible = .35)				
On the eligible to naturalize	0.062	0.068	0.084	0.06
On the naturalized	0.114	0.101	0.12	0.098
On the average person	0.096	0.116	0.108	0.116
Self-employment (raw difference naturalized-naturalized eligible = -.01)				
On the eligible to naturalize	-0.024	-0.023	-0.024	-0.025
On the naturalized	-0.026	-0.028	-0.025	-0.027
On the average person	-0.025	-0.026	-0.025	-0.026
Employed during the year (raw difference naturalized-naturalized eligible = .04)				
On the eligible to naturalize	0.026	0.026	0.027	0.022
On the naturalized	0.049	0.045	0.04	0.042
On the average person	0.04	0.038	0.035	0.035
Home ownership (raw difference naturalized-naturalized eligible = .20)				
On the eligible to naturalize	0.063	0.062	0.074	0.064
On the naturalized	0.115	0.121	0.126	0.118
On the average person	0.101	0.105	0.112	0.104
Participation in SNAP, SSI, Medicaid or cash assistance (raw difference naturalized-naturalized eligible = -.09)				
On the eligible to naturalize	0.012	0.011	0.006	0.015
On the naturalized	0	-0.002	-0.006	-0.002
On the average person	0.004	0.002	0.002	0.003

Notes: Annual wages and earnings are measured in log form. Persons without wages/earnings are excluded from the wage/earnings estimations. All estimates are statistically significant at least at the .05 level. Standard errors for the eligible to naturalize were estimated through bootstrapping.

Notes

1. "Yearbook of Immigration Statistics 2013 Naturalizations," table 20, Department of Homeland Security Office of Immigration Statistics, last modified May 28, 2014, accessed November 25, 2015, <http://www.dhs.gov/publication/yearbook-immigration-statistics-2013-naturalizations>.
2. In April 2015, the White House Task Force on New Americans (2015, 28–30) released an action plan that recommended, among other things, a set of measures to promote naturalization.
3. "Cities for Citizenship," accessed December 7, 2015, <http://www.citiesforcitizenship.org/>.
4. "About," New Americans Campaign, accessed December 7, 2015, <http://newamericanscampaign.org/about>.
5. "National Partnership for New Americans," accessed December 7, 2015, <http://partnershipfornewamericans.org/>.
6. "Become a Citizen," National League of Cities, accessed December 7, 2015, <http://www.nlc.org/Documents/Find%20City%20Solutions/Research%20Innovation/Immigrant%20Integration/newcityzen-brochure.pdf>.
7. For a more detailed explanation of SSI eligibility for immigrants, see "Excerpt from *Guide to Immigrant Eligibility for Federal Programs*, Table 1: Overview of Immigrant Eligibility for Federal Programs," accessed December 7, 2015, http://www.nwyc.com/s3web/1002033/docs/overview_of_immigrant_eligibility.pdf; and "Supplemental Security Income (SSI) for Noncitizens," Social Security Administration, accessed December 7, 2015, <https://www.ssa.gov/pubs/EN-05-11051.pdf>. A person's spouse's and parent's work could count toward the 40 quarters. Asylees and refugees can get SSI for up to 7 years. Pre-PRWORA immigrants who are disabled or who were receiving SSI already in August 1996 are potentially eligible, and veterans and their families are exempted from the restrictions.
8. Noncitizens are allowed in a limited number of government jobs.
9. American Immigration Council, "The Ones They Leave Behind: Deportation of Lawful Permanent Residents Harms U.S. Citizen Children," news release, April 26, 2010, <http://www.immigrationpolicy.org/just-facts/ones-they-leave-behind-deportation-lawful-permanent-residents-harm-us-citizen-children>.
10. Ibid.
11. The original version of TRIM3 is funded and copyrighted by the Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation, and operates on data from the Current Population Survey. The version used for this analysis is an adapted version that operates on ACS data; its development was funded by foundations and by Urban Institute funds.
12. More information about TRIM3 can be found at "Welcome!" Transfer Income Model Version 3, accessed December 7, 2015, <http://trim.urban.org/T3Welcome.php>.
13. Warren and Kerwin (2015) estimate 8.6 million immigrants were eligible to naturalize in 2013 and a naturalization rate of 69 percent.
14. See "USCIS Form I-912: Request for Fee Waiver," US Citizenship and Immigration Services, accessed December 7, 2015, <http://www.uscis.gov/sites/default/files/files/form/i-912.pdf>.
15. The lowest mean bias.
16. Assigning the average earnings of the eligible to naturalize to those that enter the labor market is done for simplification: these new workers may be younger, or their years in the US or their education could be different from those already in the labor market.
17. In this model, the matching technique in column 1 of table D.1 produces the lowest mean bias.
18. The term *tax revenues* is used for easier understanding, but the correct term is *tax liabilities*.
19. Noncitizen spouses and children can get credit for the work quarters of their spouse or parents in the SSI program.
20. "Estimates of the Unauthorized Population for States," Center for Migration Studies, accessed November 25, 2015, <http://data.cmsny.org/>.

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