THE ECONOMIC AND SOCIAL OUTCOMES OF REFUGEES IN THE UNITED STATES:
EVIDENCE FROM THE ACS

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ABSTRACT

Using data from the 2010-2014 American Community Survey, we use a procedure suggested by
Capps et al. (2015) to identify refugees from the larger group of immigrants to examine the
outcomes of refugees relocated to the U.S. Among young adults, we show that refugees that
enter the U.S. before age 14 graduate high school and enter college at the same rate as natives.
Refugees that enter as older teenagers have lower attainment with much of the difference
attributable to language barriers and because many in this group are not accompanied by a parent
to the U.S. Among refugees that entered the U.S. at ages 18-45, we follow respondents' outcomes
over a 20-year period in a synthetic cohort. Refugees have much lower levels of education and
poorer language skills than natives and outcomes are initially poor with low employment, high
welfare use and low earnings. Outcomes improve considerably as refugees age. After 6 years in
the country, these refugees work at higher rates than natives but they never attain the earning
levels of U.S.-born respondents. Using the NBER TAXSIM program, we estimate that refugees
pay $21,000 more in taxes than they receive in benefits over their first 20 years in the U.S.

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I. Introduction

The United States Department of State defines a refugee as a person who had fled their homeland and cannot return because they have a well-founded fear of persecution in their home country due to race, religion, nationality, political opinion, or membership in a social group.[1] The United Nations estimates that currently there are 21 million refugees in the world and another 41 million that have been displaced from their homes but are living within their own country.[2] Every year, thousands of refugees are admitted to the United States under the United States Refugee Admission Program.[3] Since 1975, when the current program was started, over 3 million refugees have been resettled in the U.S.[4] It is estimated that fewer than one percent of refugees are actively resettled to a third country and about two-thirds of this group are resettled in the United States.[5]

In recent years, the Syrian refugee crisis has brought renewed attention to the U.S. refugee resettlement program. The civil war in Syria has produced an estimated 4.8 million refugees since 2011, the bulk of whom have fled to the nearby countries of Turkey, Lebanon, Jordan, Iran and Egypt.[6] In response to this crisis, President Obama committed to accepting 110,000 refugees in Fiscal Year 2017, a 57 percent increase over the number accepted in 2015, with the bulk of the new refugees expected to come from Syria.[7] The change in the number and identity of the refugees entering the U.S. has led to concerns on two fronts. First, there is a fear that terrorists from the Islamic State of Iraq and Syria (ISIS) are hidden among the refugees. This sentiment has been

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[1] https://www.uscis.gov/humanitarian/refugees-asylum/refugees
[2] http://www.unhcr.org/en-us/news/latest/2016/6/5763b65a4/global-forced-displacement-hits-record-high.html
[3] http://www.state.gov/j/prm/ra/admissions/
[4] http://www.state.gov/j/prm/ra/
[5] https://www.state.gov/j/prm/ra/
[6] http://data.unhcr.org/syrianrefugees/regional.php
[7] https://www.washingtonpost.com/news/post-politics/wp/2016/09/14/white-house-plans-to-accept-at-least-110000-refugees-in-2017/?utm_term=.900d9965986b

expressed by a number of commentators[8] as well as the current U.S. President, Donald Trump.[9]

Second, there is anxiety over the fiscal costs of the U.S. Refugee Admissions Program. Not only does the Federal government bear the direct costs incurred during resettlement, but, as refugees become eligible for most Federal government transfer programs once resettled, it also bears any indirect costs associated refugee enrollment in these programs. As a result, some have suggested the fiscal cost of resettlement is too high.[10,11,12]

Despite the size of the U.S. refugee resettlement program, there is surprisingly little research about how well refugees do economically and socially in the U.S. after they are resettled. A large literature examines the social and economic outcomes of immigrants to the United States. Works by Borjas (1985 and 1995), Chiswick (1978 and 1991), LaLonde and Topel (1992), Trejo (1997), Card (2005), Antecol and Bedard (2006), and Borjas and Katz (2007) use large, nationally-representative samples and consider a variety of outcomes. The literature on refugees, however, tends to be much smaller. This is due to three major constraints. First, major Federal data sets such as the Current Population Survey, the Census Public Use Micro Samples or the American Community Survey (ACS) do not identify the refugee status of immigrants in the data. Second, the majority of data collected about refugees tends to not include long-term follow-ups and/or is not available to researchers. The U.S. government collects some data on the economic status of refugees in two data sets. The Department of State has cooperative agreements with nine domestic agencies that resettle refugees. Under their contract with the Department of State, resettlement agencies receive a lump sum per refugee to provide three months of service to help the refugees acclimate to life in the U.S.

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[8] http://www.aei.org/publication/how-the-islamic-state-used-syrian-refugee-flows-to-attack-europe/, https://www.washingtonpost.com/world/national-security/how-europes-migrant-crisis-became-an-opportunity-for-isis/2016/04/21/ec8a7231-062d-4185-bb27-cc7295d35415_story.html?utm_term=.8aad9d72ce1e,
[9] http://www.cnn.com/2015/11/16/politics/donald-trump-syrian-refugees/
[10] http://cis.org/High-Cost-of-Resettling-Middle-Eastern-Refugees
[11] https://www.washingtonpost.com/news/the-fix/wp/2015/11/30/heres-how-much-the-united-states-spends-on-refugees/?utm_term=.b1a3e8f683a7
[12] https://www.numbersusa.com/news/additional-syrian-refugees-would-cost-taxpayers-65-billion

As part of the contract, the supporting agencies are required to identify the employment status of refugees 180 days after arrival in the U.S. Therefore, there is data on employment status at 180 days. As part of its annual report to congress about the refugee program, the Department of Health and Human Services conducts the Annual Survey of Refugees (ASR), a survey of roughly 2500 refugees that entered the country over the past eight months to five years. The ASR does contain detailed data about employment and use of Federal income transfer programs but the ASR data is not available for research purposes.[13] Third, the limited amount of data on refugees that includes both long-term outcomes and is available to researchers tends to be from longitudinal surveys where there are small numbers of refugees. For example, the New Immigrant Survey (NIS), a longitudinal survey of 8,573 immigrants to the U.S. that received permanent residency in the U.S. in 2003, has less than 400 refugees in the data set.[14]

Given these constraints, what refugee literature does exists tends to concern very specific populations, uses very small samples, relies on data from a small number of countries with high refugee totals, or focuses on very short-term outcomes. For example, Takeda (2000) looked exclusively at Iraqi refugees that settled in two Southeastern states and his analysis included data from only 105 refugees. Similarly, Chiswick (1993) examined the economic adjustment of specifically Jewish refugees from the Soviet Union to life in the U.S., and Rumbaut's work (1989a and 1989b) focused on outcomes for 500 refugees from Southeast Asia. Potocky-Tripodi (2004) relied on a larger sample in examining the outcomes of 2,400 Asian and Hispanic refugees, but all of these refugees were from just two communities (San Diego and South Florida). Connor (2010) compared outcomes of refuges and other immigrants with data on 394 refugees from the NIS dataset. Finally, Beaman (2012) examined the 180-day employment outcomes for 1,700 male

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[13] https://www.acf.hhs.gov/sites/default/files/orr/arc_15_final_508.pdf
[14] http://nis.princeton.edu/

refugees resettled by one voluntary resettlement agency between 2001 and 2005 and explored the importance of social networks in job placement rates.

The results from the studies listed above suggest that refugees tend to have poor educational levels and language skills upon arrival (Connor, 2010; Potocky-Tripodi, 2004) and economic outcomes such as earnings and poverty rates tend to be worse for refugees than the typical immigrant (Connor, 2010). There is conflicting evidence on the importance of social networks. Beaman (2012) found refugee employment rates are better when they are resettled in areas with larger refugee communities, but results in Potocky-Tripodi (2004) showed little benefit of resettling refugees in areas with a high fraction of other refugees. Beaman (2012) noted that employment outcomes of new refugees tend to be worse if there are higher numbers of more recent refugees.

In this paper, we outline a procedure that identifies groups of individuals in the 2010-2014 ACS that have a high likelihood of being refugees. We rely on data from the Department of State (DOS) on refugee admissions and data from the ACS on total immigration. The Department of State identifies the annual counts of refugees from specific countries. Within the ACS, we can identify the total number of people that migrated from a particular country in a particular year, including both refugees and non-refugee immigrants. In general, we would expect the number of total migrants to be larger than the total number of refugees for a unique country/year pair. However, for some country/year pairs, particularly places and times of political unrest, we would expect the majority of migrants to the U.S. to be refugees. Thus, when we identify country/year pairs where weighted immigrant totals in the ACS are close to refugee totals as reported by the DOS, we can be reasonably confident that the respondents in the ACS are in fact refugees. With this group, we can then use the extensive economic data collected in the ACS to examine the long-term economic outcomes of refugees in this country by constructing synthetic cohorts. This procedure was initially suggested by Capps et al. (2015) in a report for the Migration Policy Institute

and is similar in spirit to how Schoellman (2016) identified that immigrants from Southeast Asia that entered the U.S. in the 1970s were mostly refugees. In a similar vein, (Potocky-Tripodi, 2001) examined outcomes from the 1990 1-Percent Census Public Use Micro Samples for immigrants from the Soviet Union, Eastern Europe, Southeast Asia and Cuba, arguing that a high fraction of immigrants from these countries were refugees. We demonstrate that this procedure identifies the county/year pairs where roughly 33 percent of refugees that entered the country over the 25-year period from 1990-2014 emigrated, and when our sample of refugees is compared to the population of refugees that entered the U.S. over that time, the two look very similar. Our analysis sample includes 19,298 refugees aged 0-65 that entered the country between the ages of 0 and 45. This is the largest sample of refugees analyzed to date.

With this data, we generate a synthetic panel of refugees and ask: What are refugees' economic and social outcomes as they age in the U.S.? Initially, we examine the outcomes of refugees that enter as children. Our results indicate that, at ages 19-24 and 23-28, refugees who enter the U.S. before the age of 14 graduate high school and college, respectively, at the same rates as U.S.-born survey respondents, consistent with Schoellman's 2016 analysis of refugees that arrived in the U.S. from Indochina before the age of six. On the other hand, at ages 19-24 and 23-28, the high school and college completion rates, respectively, for refugees that enter after age 14 decline monotonically by age at entry to the U.S. Supplementary analyses suggest that the poor outcomes for older teens may largely be due to language difficulties and/or the fact that many children in this age range enter the country as unaccompanied minors. However, we also find that refugees who arrived as children of any age have much higher school enrollment rates than U.S.-born respondents of the same age. As a result, observed differences in high school graduation between refugees and natives observed at ages 19-24 disappear when we examine them 10 years later. Likewise, the observed differences in college completion rates between the two groups are halved as the

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respondents age 10 years. Lastly, when we hold educational attainment constant, we show there is no difference in economic outcomes between refugees who arrive as children and U.S.-born survey respondents.

Next, we construct a synthetic cohort of refugees that entered the country between ages 18 to 45 and examine their economic progress over a 20-year period as compared to a similarly-aged group of U.S.-born respondents to the ACS. Adult refugees have substantially lower levels of educational attainment and much weaker English language skills than the comparison sample. Unsurprisingly, they also have much lower earnings and higher welfare use than U.S.-born respondents. However, most economic outcomes such as employment and earnings improve as refugees age in the country, while enrollment in government transfer programs tends to decline considerably over the same period. These results are similar to the trends found in Capps et al. (2015). The improvements in earnings tend to be correlated with noticeable improvements in language skill, but we find this explains only a minor component of the changes. Controlling for age, gender and educational status, refugees eventually have higher labor force participation and employment rates than U.S.-born respondents of similar ages after about 10 years in the country. Controlling for education, refugees never obtain the levels of income of U.S.-born respondents but once we control for these factors and after about 10 years in the U.S., refugees have similar higher levels of welfare and food stamp use than the comparison group.

In the final section of the paper, we use the detailed data about household composition, geographic location and earnings from the ACS and estimate with the NBER TAXSIM model the taxes paid by refugees over a 20-year period. We compare this to the direct costs of resettlement and the fiscal costs of refugees' participation in social safety net programs. Our results suggest that on an annual basis, for the first eight years in the U.S., refugees receive more in benefits than they pay in taxes. After the eighth year, taxes paid tend to be greater than benefits received. Summing

revenues and expenditures over time and properly discounting, we calculate that those that enter the country from ages 18-45 pay on average $21,000 more in taxes to all levels of government than they receive in benefits over a 20 year period.

In the next section, we review the refugee resettlement process as well as some of the related literature on refugees. In section III, we outline our procedure to identify refugees in the ACS and examine how well our sample mirrors the entire population of refugees in the U.S. In section IV, we outline the assimilation of refugees that enter as children and in section V we consider the results for refugees that enter at ages 18-45. In section VI we estimate the net fiscal costs of this adult refugee group. We make some concluding remarks in section VII.

II. An Overview of the Refugees Resettlement Process in the U.S.

In this section we provide a brief outline of the refugee resettlement process in the U.S. The following description borrows heavily from a variety of sources including Beaman (2012), Capps et al. (2015), and the Refugee Council.[15]

The United States Refugee Admissions Program (USRAP) is one of the largest and oldest resettlement programs in the world. It is administered by three different federal agencies: the Bureau of Population, Refugees and Migration (PRM) at the DOS; the Office of Refugee Resettlement (ORR) at the Department of Health and Human Services (HHS); and the Asylum Division of the U.S. Citizenship and Immigration Service (USCIS) of the Department of Homeland Security (DHS). Potential candidates for resettlement are brought to the attention of the Federal government primarily through referrals from the United Nations High Commissioner for Refugees (UNHCR), but some are brought to the attention of U.S Embassies through non-governmental organizations (NGOs). Candidates for resettlement fall into one of three priority areas. "Priority 1"

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[15] http://www.rcusa.org/resettlement-process/

cases include refugees of any nationality that have evidence of past persecution or a credible fear of persecution. Cases that qualify as "Priority 2" include refugees who belong to certain religious groups from the former Soviet Union, members of certain groups inside Iraq and Cuba, children from Honduras, El Salvador, and Guatemala, as well as ethnic minorities from counties such as the Congo, Burma, Bhutan, Iran and Iraq. Cases are considered "Priority 3" if the refugee is a family member of previously-resettled refugees from a list of 21 countries.

Once a candidate has been identified for possible resettlement, they are instructed to gather documentation to justify their refugee status, such as arrest warrants, affidavits, prison records, etc. If no documentation is available, third-party interviews can be conducted to verify their claims. During this stage, applicants are usually assisted by sponsoring NGOs or the UNHCR. Candidates must also be interviewed by DHS, which has the sole authority to grant refugee status. Applicants are typically not accepted for resettlement if they have certain health-related problems, a history of criminal activity or are considered security risks.

Refugee Support Centers (RSC) run by NGOs and the International Organization for Migration (IOM) provide refugees with travel assistance and orientation materials about life in the U.S. ahead of their arrival. The IOM makes the travel arrangements, but the plane fare is typically paid for by the refugees and financed through interest-free loans that refugees are expected to start paying down about 6 months after arrival. It usually takes 6 to 12 months for the DHS to accept a candidate into the resettlement programs and another 6 to 12 months for the refugee to arrive in the U.S.

After the DHS has referred a candidate for resettlement, they are assigned to one of nine voluntary agencies[16] or VOLAGs that are under contract with the ORR and the DOS to implement

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[16] These agencies are Church World Service, Ethiopian Community Development Council, Episcopal Migration Ministries, HIAS, The International Rescue Committee, Lutheran Immigration and Refugee Service, U.S. Committee for

the refugee resettlement process.   The goal of the resettlement process is assist refugees in becoming economically self-sufficient as soon as possible. The VOLAGs receive roughly $2000 per refugee for resettlement services but many of the organizations supplement these costs with their own resources. During the first 30 days after arrival, the VOLAGs are expected to provide for refugees' basic needs, such as housing, clothing, furniture, English as a second language instruction, medical care, and job training. The VOLAGs also assist eligible families with enrollment into Federal assistance programs such as Temporary Assistance for Needy Families (TANF) or the Supplemental Nutrition Assistance Program (SNAP). About 30 days after arrival, DHS provides individuals with an Employment Authorization Document, allowing them to work legally within the United States. VOLAGs can receive matching grants that provide an additional 120 days of support, so long as the refugee agrees to accept their first job offer.

III. Identifying Refugees in the ACS

The primary dataset used in our analysis is the Public Use Microdata Samples from the American Community Survey (ACS). The ACS replaced the long form of the decennial census, and surveys roughly one percent of the U.S. population each year. The survey is designed to be pooled over a five-year period, allowing the Census to construct moving averages of aggregate economic, social, and demographic information in small geographic areas. The Census Bureau randomly selects addresses to be surveyed, rather than households, in order to have a geographically-representative sample.

Our data comes from the 2014 five-year ACS, which pools the surveys from 2010 through 2014 to provide data on five percent of the U.S. population. We use the IPUMS.org ACS samples (Ruggles et al., 2015). While the ACS is not representative of the U.S. population due to variation in

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Refugees and Immigrants, United States Conference of Catholic Bishops/Migration and Refugee Services, and World Relief.

response and coverage rates among subpopulations, the Census Bureau uses sample weights to account for this issue. A respondent's sample weight in the census is an estimate of how many people in the population the respondent represents.[17]

As discussed in the introduction, a major problem researchers face in attempting to study the long-term outcomes of refugees in the U.S. is the inability to identify them in standard surveys. The ACS does identify immigrants, which has aided the development of an extensive literature on their outcomes, but does not record the reason for immigration. Thus, it is not clear which immigrants are refugees. In order to circumvent this issue, we identified country/year pairings in which the majority of immigrants were refugees, as suggested by Capps et al. (2015).

The ACS contains two variables that we use to identify refugees: the year of migration to the U.S. and country of birth. With these variables and the sample weights, we can obtain an estimate of I_{ct}, the number of immigrants to the U.S. from country c in year t. The Yearbook of Immigration Statistics, compiled by the Department of Homeland Security, contains the number of refugees entering the U.S. from every country for every year between 1990 and 2014.[18] Using this data, we obtain R_{ct}, the number of refugees arriving in the U.S. from country c in year t. We define the refugee concentration ratio for a country/year pairing as $RCR_{ct} = R_{ct} / I_{ct}$. This variable estimates the fraction of immigrants from a country/year pair that are refugees. Figure 1 graphs the number of refugees (vertical axis) versus the number of immigrants (horizontal axis) in a county/year pair from all countries that had at least 1 refugee between 1990 and 2014, but fewer than 20,000 immigrants per year as measured by I_{ct}.[19] Points along the 45 degree line are country/year pairs where the RCR is equal to 1 and hence we are confident the vast majority of immigrants in that country/year pair

[17] http://www.census.gov/programs-surveys/sipp/methodology/weighting.html
[18] https://www.dhs.gov/immigration-statistics/yearbook
[19] We truncated the X axis in this graph for readability of the graph -- countries with the largest immigrant counts had virtually no refugees.

are refugees. A small number of data points fall above the 45° line, which is most likely due to our use of ACS weights. In our analysis below, we limited our attention to country-year pairs which had an RCR greater than 0.7. Immigrants from country/year pairs that fall in this range are likely to be refugees.

Table 1 shows the 137 country-year pairs that have an $RCR_{ct} > 0.7$ and are included in our sample. This sample includes 22,350 individual survey respondents. With an average person-weight of 26.29, the observations in our dataset represent around 588,000 refugees. The U.S. admitted around 1.80 million refugees between 1990 and 2014, so our sample represents approximately 33 percent of the total refugees that entered the U.S. during the past 25 years.

The sample of refugees in our analysis come from select country/year combinations: those in which almost all people entering the U.S. are doing so as refugees. These countries are more likely to be in the midst of a civil war, have an unstable political regime, or otherwise be in a state of unrest. The sample of refugees in our analysis may oversample from countries with the worst violence and human rights abuse. While it is not possible to directly test if our sample is representative of the refugee population at whole, we have some baseline demographics for which we can check if our sample of refugees is similar to the general population of refugees. The Office of Refugee Resettlement (ORR) and the Department of Homeland Security publish the age, gender, country of origin, and state of resettlement for the entire refugee population at their time of arrival.[20] Figure 2a shows the age distribution of refugees identified in our sample as compared to the age distribution of all refugees entering the U.S. over the same period. Figure 2b shows the continent of origin of refugees used in this analysis compared to the continent of origin of all refugees entering the U.S. between 1990 and 2014. Figure 2c shows the gender breakdown of refugees in our sample versus all refugees in the U.S. Finally, Figure 2d shows the state the refugees in our analysis were

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[20] https://www.acf.hhs.gov/orr/resource/annual-orr-reports-to-congress

resettled in versus the original state of residence for all U.S. refugees. In this final graph, we include the 45 degree line and point along this line mean the counts on the two axis are the same. Gender, age, and state of residence in our dataset were representative of the total population of refugees, with some small exceptions. The demographic with the most significant difference is the continent of origin. Europe is underrepresented and Africa and Asia are overrepresented in our sample.

IV. Outcomes of Refugees Resettled as Children and Young Adults

We initially consider the economic outcomes of refugees resettled before the age of 20. We will examine two sets of outcomes: educational attainment and labor market outcome measures. For each outcome we will consider a separate subset of data from our ACS sample outlined above.

Students in the U.S. normally complete high school by age 18 so to measure high school graduation rates we will examine a sample of refugees that entered the U.S. before 17 but were at least 19 years of age when they were surveyed in the 2010-2014 ACS. Similarly, U.S. students routinely complete college by age 22, so we measure college graduation rates by examining a sample of refugees that entered the U.S. before age 20 but who were at least 23 years of age when they responded to the ACS. We compare these sub-samples of refugees to similarly-aged groups of U.S. born residents as a frame of reference.

We constructed our sub-samples for the high school completion analysis to be balanced along two dimensions: age at entry to the U.S. (4-16) and age at the time the survey was completed (19-24). By fixing an age range that we observe people and taking data over a five-year range in the ACS, there are fewer observations in the younger ages so we deleted people that arrived ages 0-3. For example, someone that arrived at age 0 and was age 24 could have only been observed in the 2014 ACS. Someone that arrived as age 1 and is 24 could only be observed in the 2013 or 2014 ACS, etc. For each age of entry 4-16, we could have observed the person at five different ages and at in

five difference ACS samples. The results in Schoellman (2016) indicate that the education outcomes for refugees that arrive 0-6 are similar to outcomes for natives so our results should not differ much by excluding the youngest ages at arrival. Similarly, the college graduation analysis includes respondents aged 23 to 28 at the time of the survey, who arrived between the ages of 8 and 19. In these two sample, there are 1,366 and 1,432 refugees in our data sets, respectively.

In Table 2, we report some simple descriptive statistics (means and standard deviations) for two samples. Both contain respondents aged 19-24 from the 2010-2014 ACS. The first column presents statistics for 19- to 24-year old refugee respondents to the 2010-2014 ACS that entered the U.S. between the ages of 4 and 16; the second presents the same results for U.S.-born respondents in the same age group. The average ages are similar across the two groups, but a higher fraction of refugee respondents are female. The ACS asks respondents aged 5 and above to self-report their English language ability. The possible responses are "Does not speak English," "Speaks English but not well," "Speaks English well," "Speaks English very well," or "Only speaks English." We combine the last three groups and define these as "Speaks English well or above." Note that there is not much difference in this fraction between refugees and natives.

Overall, high school graduate rates are only two percentage points lower for refugees than U.S.-born respondents. There is, however, tremendous heterogeneity in this number based on the age when the refugee migrated to the U.S. In Figure 3a, we report with the solid line the high school graduation rate for refugees aged 19 to 24 that entered the country between the ages of 4 and 16 in our ACS sample. The straight dotted line is the high school graduation rate for U.S.-born respondents to the ACS aged 19-24. Notice that for refugees that entered the U.S. by age 13, there is little difference in the high school graduation rate between refugees and U.S. born respondents. After age 13, graduation rates drop off sharply. We discuss a possible explanation for this drop-off later in this paper.

The basic graph in Figure 3a presents raw totals. To generate some notion of the precision of the differences, we next run a simple regression. We combine our sample of likely refugees respondents aged 19-24 that arrived between ages 4-16 with the data on all U.S.-born respondents aged 19-24. We regress a dummy for whether the person graduated high school on dummies for sex, age at the time of the survey, and age at entry to the U.S (where the reference group is those respondents born in the U.S.). This regression includes 1,037,840 observations and the sample mean high school graduation rate for U.S.-born respondents is 90.4 percent. We report the coefficients and 95 percent confidence intervals for the age at entry dummy variables in Figure 3b. Note that through entry age 13 there is no statistical difference in the high school graduation rates of refugees and native born respondents. For those refugees that arrived in the U.S. aged 14-16, high school graduation rates decline precipitously, and the differences in graduation rates between this group and native born respondents are statistically significant.

In Table 3, we report the means for the slightly older sample that we will use to examine college attainment and other economic outcomes. In this table, we use data from the ACS for those aged 23-28. In the first column of results we have data for refugees that entered the U.S. at ages 8-19 and the second column for U.S. born residents of a similar age. The average ages and fraction female are very similar across the two groups. The fraction with a college degree is only two percentage points lower for refugees. Labor force participation is the same across the two groups, employment rates are slightly lower for refugees, and refugees make about 8 percent less at these ages than U.S.-born respondents.[21]

In Figure 4a, we report the fraction of refugees with a college degree among those aged 23-28 who entered the U.S. at ages 8-19. The dotted line is the college graduation rate for U.S.-born

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[21] In the remainder of the paper, all dollar values are converted to constant January 2014 dollars.

adults aged 23-38 in the ACS. In Figure 4b, we pool the refugees and U.S.-born from Figure 4a and regress a college graduation dummy on sex and age dummies, as well as dummies for refugees' age at entry. Note that the patterns in these two figures are quite similar to those for high school completion. Among those that entered as refugees aged 8-13, we see little difference in college graduation rates between them and similarly-aged U.S.-born respondents. However, for those that entered at ages 14-19, we observe negative coefficients on the age of entry in Figure 4b, with the differences between graduation rates statistically different from zero for those that entered at ages 17-19.

Why are the results so different for refugees that arrive in the U.S. as older teens? There are two obvious potential explanations. The first is the language barrier: A large fraction of refugees enter the U.S. with poor English language skills. In Figure 5a, we take a sample of our refugees from our ACS sample that entered the U.S. within the last 3 years and graph the fraction that does not speak English or does not speak English well, by age at arrival. There is no obvious trend in the data by age of entry, but 29.7 percent of all refugees that enter as children have significant language difficulties in the first three years after arrival. The means in Tables 2 and 3, however, suggest this difficulty has been mostly overcome by the time refugees are surveyed in the ACS. This might be less of an issue for those that arrive at younger ages as they have more time to make up any language background before they have to graduate high school.

A second potential problem for refugees who arrive as older teens is that many arrive unaccompanied by an adult, a scenario that occurs less often for younger children. Hence older teen refugees are more likely than younger children to be resettled as foster children in the U.S. The lack of a parent in the household may be detrimental to their outcomes. We can verify the more frequent foster status of refugees that arrived as older teens in the ACS. The IPUMS version of the ACS is a rectangular data set where each row is a different person. For each child in the data set,

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IPUMS has added a variable that identifies the line number of their best guess as to who in the household is the biological mother of the child. In Figure 5b, we take the sample of refugees that have arrived in the past three years at ages 0-17 and graph the fraction of refugees where the biological mother cannot be identified in the household. Note that there is a strong upward trend in this figure with age. Only 5 to 10 percent of children ages 0-14 are without a mother in the household. This number increases to 20 to 30 percent for those entering at ages 15-16, and tops 40 percent for those entering at age 17.

We cannot directly test the role of language or the lack of parents because we only have information for respondents at the time of the ACS and not at the time of arrival. The best we can do is make a guess as to the respondent's English ability and parental accompaniment at the time of their arrival. We do this by first restricting the sample to respondents that arrived in the past three years by age of arrival and continent of arrival. We assume that the distribution of unaccompanied minors and poor English language skills of 8 year olds from Africa in the 2010-2014 ACS is similar to that of 19-24 year old ACS refugee respondents that arrived as an 8 year old from Africa, at the time of their own arrival to the U.S. We merge in two variables: the fraction of children in the cohort that do not have a biological mother in the household and the fraction that speak English only, well or very well. We then add these variables to the basic regressions.

In Figure 3c, we report the coefficients and 95 percent confidence intervals for the age of entry dummies for the same regression we ran in Figure 3b with these two additional variables included. Note that the negative coefficients for the older teens are essentially cut in half when we add these variables. In Figure 4c we report the coefficients on age of entry in the college graduation model with these two additional variables. Again, the large negative coefficients for older teens are essentially cut in half by this exercise. Note that the confidence intervals widen considerably on the age of entry dummies in Figures 3c and 4c. This is due to the fact we have very little variation in the

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two variables we have added to the model. This is a very imprecise way to obtain controls for these two covariates but is the best method available given the data constraints. Even with these limited variables, we are able to eliminate half of the difference in graduation rates, suggesting these two explanations should be further explored in future analyses.

The estimates above indicate that for most refugees, educational outcomes are similar to U.S.-born respondents in the ACS. In this section, we consider whether, conditional on education, outcomes are different between refugees and natives. In this case, we use the sample of native-born adults aged 23-28 and add to that a sample, adult refugees of the same age that entered the U.S. at ages 8-19. We examine a series of outcomes such as dummies for labor for participation and whether they are currently employed, labor market earnings and the natural log of earnings for those with positive earnings. These outcomes are regressed on dummies for age and sex as well as a set of dummies for each educational categorical response in the ACS. To capture the role of age at entry for refugees but boost power for individual coefficients, we pool age at entry groups and estimate four dummies for refugees that entered at ages 8-10, 11-13, 14-16, and 17-19, with U.S. born the reference category.

In Figures 6a through 6d, we report the coefficients and 95 percent confidence intervals for the four age at entry dummy variables for regressions where the outcomes are a) a dummy for labor force participation; b) a dummy for whether they are employed; c) labor earnings and; d) the natural log of earnings for those with positive earnings, respectively. In Figure 6a, the three oldest age at entry groups have higher labor force participation rates than natives, with a statistically significant 5 percentage point higher rate of participation for those that entered at 14-16. On the other hand, those that entered at ages 8-10 have a statistically significant lower rate of participation of about the same amount. In Figure 6b, the three oldest age of entry groups have no statistically different employment rates than natives, but again, those that entered aged 8-10 have a statistically significant

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6 percentage point lower employment rate than natives. In Figure 6c, we see that those who entered at ages 8-10 and 17-19 earn about $2,100 less than natives on an annual basis. The result for the 8-10 entry group is statistically significant at the $p=0.1$ level. In Figure 6d, we examine the natural log of earnings for those with positive earnings. We see some difference for refugees that arrived at ages 17-19 but this difference it is not statistically significant.

The interpretation of these results is dramatically changed when we consider Figure 6e, which reports results when the outcome is a dummy variable that identifies whether the person is currently enrolled in school. Refugees in all four arrival age groups are much more likely to be in school at the time of the survey than U.S.-born respondents. The youngest and oldest arrival age groups are a statistically significant 10 and 15 percentage points, respectively, more likely to be in school than their U.S. counterparts. This suggests that the lower labor force participation, employment and earnings we see in the earlier figures may simply capture the fact that these groups are still enrolled in school. This is verified in Figure 6f, where we re-run the regression from Figure 6c, where labor earnings are used as the outcome of interest, and we add as a control a dummy for whether the respondent is currently enrolled in school. The large and marginally statistically significant coefficient on the refugee dummy for those that entered at ages 17-19 disappears, while the coefficient for those that entered at ages 8-10 is cut and half and is no longer marginally significant.

The results in Figure 6e suggest that refugees who enter the U.S. as teens, regardless of age at entry, have higher school enrollment rates than natives. This suggests that the snapshots of high school graduation rates for respondents aged 19-24 at the time of the ACS presented in Figure 3, and college graduation rates for respondents aged 23-28 from Figure 4 might change over time. To consider this possibility, in Figure 7a, we report high school graduation rates for refugee respondents to the ACS that arrived at ages 14-16 from three different age groups: 19-23, 24-28 and 29-33. The

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steep decline in high school graduation rates by age of entry we found in Figure 3a is reflected in the first set of numbers. However, as the refugees age in our synthetic cohort, high school graduation rates rise dramatically. By the time refugees that entered at ages 14-16 are 24-28 years of age, their high school graduation rates are now 92.9, 93.1, and 88.1 percent, respectively, compared to 91.5 percent for the U.S.-born respondents. The high school graduation numbers slip some when we age this group another five years, illustrating the problems inherent in using synthetic cohorts, but still remain at least 10-15 percentage points above graduation rates for the 19-24 cohort.

In Figure 7b, we repeat this exercise for college graduation for teens that entered the U.S. at ages 17-19. We calculate college graduation rates for ACS respondents in three different age groups: 23-27, 38-32 and 33-37. As these refugees age in a synthetic cohort, the college completion rates rise dramatically. Among refugees that entered at ages 17-19, college graduation rates were 21, 13 and 10 percent, respectively, at ages 23-27. Aging this cohort by five years increases these numbers to 28, 21 and 28 percent, respectively. Aging the cohort by five years again, these numbers increase to 31, 39 and 28 percent. These graduation rates are still below the college graduation rates for the U.S.-born respondents, but aging the cohorts by 10 years halves the difference in graduation rates present at earlier ages.

In summary, refugees that arrive to the U.S. as children under the age of 15 do as well as natives on measures of educational attainment. These results are very similar to those found by Schoellman (2016), who performed a similar exercise for refugees that arrived as children aged 0-5 from Indochina. Refugees that arrive as older teens do much poorer on measures of educational attainment but much of this is explained by language barriers and the fact they are more likely to arrive in the U.S. without parents. These poor outcome are also very temporal in that refugees that arrive as children, regardless of their age at arrival, attend school at much higher rates than natives during their 20s. Their high school and college graduation rates increase dramatically through their

early 30s, dissipating much of the early differences in educational outcomes observed between refugees and natives.

V. The Outcomes of Refugees Resettled as Adults

In this section we consider the time-path of economic outcomes of refugees as they age in the United States. The ACS provides data from only one point in time, a snapshot of the refugee's current life. Ideally, we would follow one cohort of refugees over time. Since this is not possible, we construct a synthetic cohort. A refugee who has been in the U.S. for 1 year is thought of as the synthetic cohort's first year in the U.S. A refugee who has been in the U.S. for 2 years represents that cohort's second year in the U.S. A refugee who has lived in the U.S. for 20 years forms a part of that cohort's twentieth year in the U.S. In this way, we can study the path of an average refugee during their time in the U.S. Comparing the outcomes of refugees who have been in the U.S. for 1 year versus those who have been here for 20 years can provide insight into the long term economic adaptation of refugees.

In this case, we examine adults that entered the country as refugees at ages 18-45 and were aged 18-65 at the time of the survey in the 2010-2014 ACS.[22] Given these sample rules, we have people that have been in the country for up to 20 years.[23] In Table 4 we present some simple descriptive statistics (means and standard deviations) for refugees and U.S.-born adults aged 18-65. There are 12,309 refugees in this sample and 8.2 million U.S.-born adult respondents.

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[22] The lower age in the group does not change because in the 2014 ACS there refugees that just entered the country at age 18.

[23] With DHS data on refugee admissions dating back to 1990 and survey data from 2010 to 2014, this analysis could have included refugees who have been in the country for up to 24 years. We ultimately exclude refugees who have been in the country 21 – 24 years, as their samples are increasingly small. While a refugee who has been in the U.S. for 20 years could have been surveyed in any of the 2010 to 2014 ACS, a refugee in the U.S. for 24 years could only be a respondent to the 2014 survey who entered the U.S. in 1990. They could not possibly appear in the 2010 – 2013 surveys, reducing their sample by 80%.

In Table 4, refugees that arrived in the U.S. as adults are on average slightly younger and just as likely to be female as the U.S-born respondents. Refugees do, however, have much lower educational attainment than U.S.-born respondents. Their high school and college graduation rates are 23.7 and 13.2 percentage points lower, respectively, that the corresponding values for U.S.-born respondents. The fraction of people with a high level of English ability is also lower in the refugee sample. Note that for this sample of refugees who entered the U.S. as adults, English language skills are much lower than for the refugees who entered the U.S. as children. Despite lower levels of human capital, refugees have higher labor force participation and employment rates that U.S.-born respondents. Given their lower human capital, however, it is not surprising that refugees also have lower labor earnings and higher use of welfare and Supplemental Nutritional Assistance Program (SNAP) use than U.S.-born respondents.[24]

The simple difference in outcomes presented in Table 4 between the two groups masks the fact that outcomes change considerably as refugees age in place. The more years refugees spend in the country, the better their economics outcomes are. This is graphically illustrated in Figures 8a-8i. In each of these graphs, we take the cross-sectional data on refugees from the 2010-2014 ACS and place people into bins that measure the number of years since their arrival in the U.S. This is measured on the X axis. On the Y axis we report the mean outcome for each cohort. When appropriate, the gray line is the sample mean for U.S.-born respondents aged 18-65.

In Figure 8a, we show the number of observations for refugees in each cohort by the number of years spent in the U.S. This value ranges from 366 to 788 with an average of 586. Figure 8b show the average age across years spent in the U.S. For each year of arrival cohort, the mean age

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[24] The variables welfare and SNAP use measure whether the respondent is in a household that receives welfare or SNAP. These are not measured at the individual level.

increases by about a year. The average age in the refugee population equals the mean for U.S.-born respondents for the refugee population that has lived in the U.S. for 12-13 years.

In Figures 8c and 8d, we report labor force participation and employment rates, respectively, for the refugees. Both lines are positively sloped in the early years and cross the average value for U.S.-born respondents after 4 years for labor force participation and after 7 years for employment. After a relatively short period of time in the U.S., refugees are working at higher rates than natives of similar age.

In Figure 8e, we report average earnings. The graph is steeply sloped throughout most of the years in the analysis. In no year do these earnings surpass the values for natives. This is not surprising given the much lower educational attainment and English language ability of refugees that arrive in the U.S. as adults.

In Figures 8f and 8g, we report the fraction of respondents that live in households that receive SNAP and public assistance (welfare), respectively. SNAP receipt is in excess of 70 percent in the first year of refugees' residence in the U.S., but this number falls to 20 percent about 12 years after arrival. SNAP use among refugees never falls to that of U.S.-born respondents in this age range (roughly 13 percent).

Part of the pattern for these results could be improvement in language skills. In Figure 8h we graph the fraction of refugees who self-reported poor English language skills. This number is essentially zero percent for U.S.-born respondents. Note that this fraction falls from 50 to 15 percent by the 12th year in the U.S. We investigate this further in a few paragraphs.

Next, we consider how much of the difference in educational and economic outcomes between refugees and U.S.-born respondents is explained by observed characteristics such as education and language. We run a regression with both groups in the sample, controlling for a cubic

in age, sex, and educational levels. We then add a set of dummies for years spent in the U.S. (0-20), where U.S.-born respondents are the reference group.

In Figure 9a, we report the coefficients and the 95 percent confidence intervals on the years since arrival dummies for the equation where employment is the outcome of interest. We only report the numbers for employment – the results for labor force participation are the same in general terms. The numbers in this graph correspond to the numbers in Figure 8d. In that figure, 2-3 years after arrival, refugees are working 10 percentage points less than U.S.-born respondents. Controlling for observed characteristics, in Figure 9a this shrinks to a 0-2 percentage point difference and is statistically insignificant. In Figure 8d, refugees that have spent 17-20 years in the U.S. are 7 percentage points more likely to be working than their U.S.-born counterparts. Controlling for observed characteristics, this increases to about a 10 percentage point difference in Figure 9a, which is statistically significant. Controlling for age, education and gender, the employment rate difference between refugees and U.S.-born residents falls by an average of about 3 percentage points across all 21 coefficients.

In Figure 9b, we control for language ability by adding in controls for the four categories of self-reported English language ability. The slope of the graph does not change at all and the coefficients increase by about 1.4 percentage points on average across all of the 21 coefficients. In general, language ability cannot explain the slope of the results or much of the explained difference between the two groups.

In Figures 9c and 9d, we repeat the same exercise with earnings as the outcome of interest. These numbers correspond to the raw differences observed in Figure 8e. In the first six years after arrival, controlling for age, sex and education explains about 40 percent of the raw difference observed in Figure 8e. As refugees age in place, that fraction drops. For refugees that have spent 16-20 years in the U.S., the addition of controls only explains 20-25 percent of the observed

difference. Adding controls for English language ability shifts the curve up vertically by about $2,000. This means that about 60 percent of the difference between refugees and U.S.-born respondents observed in Figure 8e for the first five (0-4) and last five (16-20) years spent in the U.S. can be explained by differences in language and education.

In Figures 9e and 9e, we repeat this exercise using a dummy for whether the respondent is on welfare as the outcome of interest. After about eight years in the U.S., in most years, there is no statistically significant difference in welfare usage between refugees and U.S.-born respondents once we control for education and language. The exceptions are at 10, 12 and 20 years after arrival, although at 11 and 18 years after arrival the coefficient is of marginal statistical significance. The additional of language controls changes these results very little.

In Figures 9g and 9h we consider outcomes for regressions where the dummy variable for whether a family is enrolled in SNAP is the outcome of interest. The results of these regressions are comparable to the raw results from Figure 8f. Note that the raw difference is reduced by about 20 percent by controlling for education for people new to the country (0-4 years after arrival), but education explains roughly 60 percent of the difference for those who have resided in the country for 16-20 years. By adding controls for language ability, we explain a further 25 percent of the raw difference for the first 5 years in the country and 85 to 100 percent of the difference for those who have spent 16-20 years in the country. For those in the country between 13 and 20 years, the only statistically significant coefficient in Figure 9h is for groups that have resided in the country for 18 years.

Overall, the outcomes of refugees change dramatically as they age in place. Employment and earnings increase with the number of years in the country, while use of support programs declines. After only a few years in the U.S., refugees work at statistically significant higher rates than their U.S.-born counterparts. Refugees always earn less on average than their U.S born counterparts,

but controlling for education and language ability removes about 60 percent of the earnings differences. Controlling for education and language, after about a decade in the country, there is little statistical difference in welfare and SNAP use between refugees and natives.

VI. Measuring the Fiscal Costs and Benefits of Refugees

There has been significant debate of late about the fiscal costs associated with the refugee resettlement program.   These costs include not only the direct costs of resettlement, but, as the numbers in the previous section indicate, there are also indirect costs of resettlement in that refugees are eligible for government transfer programs. A number of groups have estimated these indirect costs and found them to be large. The Heritage Foundation estimated that Obama's proposal to admit 10,000 additional Syrian refugees would cost U.S. taxpayers $6.5 billion during the refugees' lifetimes.[25] These estimates assume that all Syrian refugees are low-skilled workers, would pay taxes and receive assistance at the same level of low-skilled immigrant workers, and would live another 50 years. The Center for Immigration Studies estimated the cost of resettling a family of 4 from the Middle East to be about $258,000 during the first 5 years after resettlement.[26] This estimate, using ORR survey data, assumes refugees contribute nothing whatsoever in taxes and assigns public education costs for refugee children to the parents.

In this section, we consider this question in more detail and ask: What are the fiscal costs of resettling adult refugees? To answer this question we need to focus on a few key facts. First, it is important to consider the temporal nature of this question. There are large upfront costs to resettlement, and refugees start their U.S. residence with high public assistance use, but the results in the previous section indicate that outcomes for refugees change considerably over their life course.

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[25] https://www.numbersusa.com/news/additional-syrian-refugees-would-cost-taxpayers-65-billion
[26] http://cis.org/High-Cost-of-Resettling-Middle-Eastern-Refugees

Employment rates and earnings increase rapidly over time for refugees, despite their educational and language ability deficits when compared to native-born adults. Second, although there are costs to running a refugee resettlement program, there may be benefits as well. These benefits can have many dimensions, but in this context we look specifically at the taxes paid by refuges to all levels of government.

a. Methodology

Refugees' costs to the government come in two main forms: the direct cost of resettlement and the indirect costs through participation in social safety net programs. The direct costs of resettling refugees are generated by the Administration for Children and Families (ACF) and the Bureau of Population, Refugees, and Migration (PRM). The ACF provides medical and social assistance to refugees, asylees, special visa holders, and Cuban and Haitian entrants. They also serve unaccompanied minors, trafficking victims, and victims of torture. Since the budgets for these three groups are separate, those costs were removed when considering the ACF budget. Over the past five years, the ACF has annually served, on average, 120,000 refugees, asylees, special visa holders, and Cuban and Haitian entrants with a budget of around $600 million. The average cost per person receiving services over the past five years is $4,870. Additionally, the Bureau of Population, Refugees, and Migration (PRM) incurs costs while helping to resettle refugees. They operate overseas and bear many of the administrative and relocation costs associated with resettlement. Their budget for refugee resettlement has been around $300 million to serve around 60,000 refugees per year. Their average annual cost per refugee is $5,324. We combine these two totals to estimate a direct cost to the U.S. of $10,194 per refugee. Our derived total estimate is slightly higher than that used by the Institute for Immigration Studies.

There are six social insurance programs that account for the majority of government payments to U.S. citizens: welfare, Supplemental Security Income (SSI), Social Security, food stamps, Medicare, and Medicaid. The ACS reports the dollar amounts of welfare, SSI, and Social Security payments received by a respondent. Food stamps, Medicare, and Medicaid are dummy variables in the ACS, indicating whether or not the respondent is enrolled in the program. We imputed the dollar amount of food stamps received using Food and Nutrition Service guidelines, which are based on family size and income.[27] The Centers for Medicare & Medicaid Services track the per capita cost of Medicare, by state and year.[28] We assumed a respondent who is on Medicare costs the average amount per enrollee in the state they lived in. Finally, the annual Actuarial Report on the Financial Outlook for Medicaid tracks average Medicaid costs of those enrolled in the program.[29] The report breaks down average costs into four types of enrollees: adults, children, the disabled, and the elderly. A respondent on Medicaid was assumed to cost the average of adult enrollees if their SSI spending was 0. If their SSI receipt was greater than 0, we assumed they cost the average amount of a disabled enrollee. In 2014, the Medicaid report broke out costs by newly eligible adults and non-newly eligible adults. Newly eligible adults made up 4.3 out of the 19.3 million adults enrolled in Medicaid in 2014. We assume that refugees followed the enrollment patterns of the general population and cost the weighted average of newly eligible and non-newly eligible adults.

One cost that is excluded from this analysis is the cost of public education for refugee children. The fiscal analysis is limited to refugees entering as adults. Functionally, we can treat refugee children as a separate economic entity. Society spends money on their behalf to educate them during their K-12 years. The previous section suggests that refugees entering as children have

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[27] https://www.fns.usda.gov/snap/how-much-could-i-receive
[28] https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Medicare-Geographic-Variation/GV_PUF.html
[29] https://www.medicaid.gov/medicaid/financing-and-reimbursement/actuarial-report/index.html

educational outcomes similar to those born in the U.S. and have similar employment rates and earnings as well. If we treat children as their own economic entity, then the expected return for paying K-12 education for refugee children should be comparable to the return to educating a U.S. child. If the investment in the education of U.S.-born children results in an economic benefit to society in this calculation, then we would expect that the investment in the education of refugee children to result in a similar benefit.

The next step in this analysis is to examine refugees' tax contributions. We used TAXSIM, a program developed by the National Bureau of Economic Research (NBER), to estimate the tax payments of refugees.[30] TAXSIM considers 22 inputs per person, including year, state of residence, dependents, filing status, income, and payments that could affect deductions. Based on this information, TAXSIM returns an estimate of federal, state, and FICA tax liabilities. In addition to these three taxes, ACS records the amount of property taxes paid by the respondent.

We made several assumptions for TAXSIM. We estimated that 60 percent of money paid on a mortgage was interest. Anyone under the age of 18 was assumed to be a dependent and anyone over the age of 22 was assumed to be independent. For respondents between 18 and 22, if they were attending school, they were classified as a dependent; otherwise they were assumed to be independent. Finally, we assumed that the share of taxes a person is responsible for is the share of income they bring in to the family. For example, consider a couple composed of one refugee and one non-refugee who file their taxes together. If the refugee brings in 70% of the income, and the couple pays $10,000 in taxes, we attributed $7,000 of the taxes paid to the refugee. We count the amount of FICA taxes payed by both the employee and the employer. In this instance, we are not interested in tax incidence but rather taxes collected.

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[30] For more information about the program, please see http://users.nber.org/~taxsim/.

Finally, we assumed that refugees paid the same amount in sales taxes as they did in state income tax. Data from the Quarterly Summary of State and Local Tax Revenues, between quarter 1 of 2010 and quarter 4 of 2014, indicates that revenues from state income tax and sales tax have been essentially the same over this period, with only a 2% aggregate difference.[31] This most likely understates the amount of sales tax paid by refugees, as it is a regressive tax. Summing state income, federal income, FICA, sales, and property taxes, we estimated the amount of taxes paid by a refugee.

Combining the estimate of taxes paid with the relocation and social insurance costs, we generate an estimate of the net fiscal costs of refugees to the U.S. government. While the ORR conducts a survey tracking refugees' economic outcomes after up to 5 years in the U.S., no study to date has tracked refugees over a longer period of time.

We also need to adjust for the time value of money. We use a two percent discount rate. The 20th year spent in the U.S. is considered the base year. Year 19 net fiscal costs are multiplied by 1.02, year 18 costs are multiplied by $(1.02)^2$, and so on. Direct resettlement costs are assumed to have been incurred in the first year a refugee enters the U.S. which in the synthetic cohort was 10 years ago, so we multiplied these costs by $(1.02)^{20}$. Summing discounted government costs and tax payments from year 0 through year 20 yields the net fiscal cost to the government of refugees during their first 20 years in the U.S.

In order to analyze only working-age refugees, we limited the dataset to those who entered the U.S. between the ages of 18 and 45. Thus, the upper age limit for a refugee in our analysis is someone who entered the U.S. at age 45, has been in the country for 20 years, and was 65 years old at the time of the ACS.

b. Results for Refugees that Entered as Adults Aged 18-45

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[31] http://www.census.gov/govs/qtax/

In Figure 9, we report the time path of the present value of fiscal costs (transfers to refugees), fiscal benefits (taxes) and the net benefits for our refugee cohort that entered the U.S. from ages 18-45 during their first 20 years in the country. The light gray line represents the social insurance costs while the dotted line represents taxes paid. Values are discounted using the two percent discount rate. Note that social insurance costs decline considerably over time while taxes paid increase. The black line represents the net transfers and the large negative value in the first period includes the relocation costs incurred during the refugees' first year in the U.S. Note that fiscal costs are larger than benefits for the first eight years in the U.S. Starting in year 9, refugees contribute more in taxes than they cost to the government in social insurance costs.

In Table 5, we aggregate these totals over the refugees first twenty years in the U.S. The results indicate that when properly discounted, the U.S. spends on average $15,148 in relocation costs and $92,217 in benefits from social programs over a refugee's first 20 years in the U.S., but refugees pay a total of $128,689 in taxes over this time period. Over their first 20 years in the U.S., refugees that arrived in the U.S. aged 18-45 pay about $21,324 more in taxes than then they take home in benefits.

We made several assumptions in our analysis about the discount rate, the Refugee Concentration Ratio cutoff, and the age range of refugees. Table 6 shows the results of this analysis with different parameters. In row 1 we replicate the results from Table 5 with the key assumptions we made for this analysis (the 0.7 concentration ratio, 2% discount rate and people that arrived aged 18-45). In rows 2 and 3 of the table, we increase and decrease the discount rate, respectively. It is no surprise that as we increase the discount rate, we bring into the present larger up-front costs and hence the average net present value (NPV) of the fiscal benefits of resettling refugees declines. In rows 4 and 5, we break the results up into two different age groups: 18-29 and 30-45. Since more time in the U.S. tends to produce better outcomes, and younger workers have more time to make up

for poor initial conditions, it is also no surprise that we find much large fiscal benefits from resettling younger refugees than older ones. However, we still find a net fiscal benefit of $4,619 of resettling refugees who are 30-45 when they enter the U.S. In rows 6 and 7, we lower and raise the refugee concentration ratio (RCR) cutoffs by 0.1, respectively. The numbers increase slightly when we use a smaller cutoff and they go down when we use a larger cutoff. While the amount of money refugees bring in to the government varies with the parameters chosen, all results are positive, indicating the estimates are not overly sensitive to the parameter selections.

There are some costs that are not included in this analysis. One is the cost that refugees might generate as a result of interaction with the criminal justice system. The average annual cost of incarceration during the period we consider is around $32,000/year.[32] Even a modest fraction of refugees are incarcerated this could generate a large fiscal cost to all levels of government. We do not believe this is an important cost in this case. The ACS is address-based survey, and much like the Census Long Form Public Use Micro Samples, it surveys people in group quarters, including prisons. Upon examination, we find only 0.5 percent of our refugees sample residing in groups quarters such as prisons (compared to 2.34 percent for the U.S.-born population) at the time the survey was taken, suggesting this cost is not a large value.

We also would like to extend this analysis to include a longer term follow-up. This is important because as the refugee population ages into their post-65 years, they become eligible for Medicare and Social Security. The problem we face with our data sample is that past the age of 65, mortality rates start to increase dramatically. A post-65 person that has died has zero Medicare costs, so any accurate estimate of Medicare and Social Security costs must build mortality into the model. With the synthetic cohorts, we only observe people in the analysis that are alive at the time of

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[32] http://archive.vera.org/sites/default/files/resources/downloads/price-of-prisons-updated-version-021914.pdf.

the survey. Without estimates of mortality patterns of refugees, it is difficult to build in expenditures after 65.

VII. Conclusion

The growth of the refugee program under the Obama administration and its subsequent retrenchment under the early stages of the Trump administration have focused attention on the U.S. Refugee Admissions Program. For a variety of reasons, despite the size of the program, we know little about how refugees fare long term in the U.S. In this paper, we develop a way to identify refugees in the ACS 2010-2014 sample. We demonstrate that our sample represents about one-third of refugees resettled to the U.S. over the last 25 years and is broadly consistent with the demographic characteristics of all refugees to the U.S. over that time period.

Looking at how well refugees do after arrival to the U.S., the results differ based on the age of arrival. When refugees arrive as children, they do as well as U.S.-born residents on measures of educational attainment. The exception is that refugees who arrive as older teens, who do substantially worse than their U.S.-born counterparts. This is primarily because of language barriers as well as the fact they are much more likely to arrive as unaccompanied minors and hence enter the foster care program upon arrival. Given the success of younger arrivals, the disparity in results between arrivals of younger and older refugee children suggests that any increased expenditures might be more effective if targeted to older teen arrivals.

Refugees that arrive as adults have much poorer human capital measures than U.S.-born residents of similar ages. For example, they have fewer years of education and much weaker English language skills. Subsequently, early on in their time in the U.S., adult refugees have lower levels of employment and earnings and higher welfare participation than their U.S.-born peers. These outcomes change dramatically over time, with earnings and employment increasingly rapidly and

welfare use declining as refugees age in place. After about six years in the U.S., refugees have higher

labor force participation and employment rates compared to similarly-aged U.S.-born residents.

After about 10 years, they have statistically indistinguishable use of welfare and SNAP. Despite

these successes, they never earn as much on average as similarly-aged natives.

A number of commentators have argued that the refugee program is too expensive given the

direct costs of resettlement and the high costs of participation in social service programs by

refugees. Our results above indicate that the intertemporal dimension of this problem is key in

examining how one views this program. At the start of their U.S. residency, refugees do extract high

costs because of the direct costs of relocation and high welfare use. However, over time these costs

decrease quickly, and our estimates show that over a twenty-year period, refugees pay $21,000 more

in taxes than they receive in benefits.

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Figure 1

Plot of Refugees by Country and Year of Entry from ORR versus
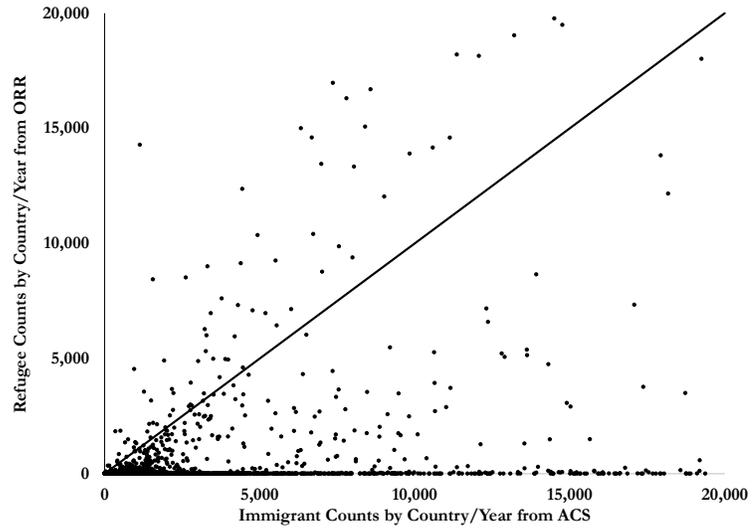Immigrants by Country/Year of Entry from ACS

Figure 2:
Comparison of Refugees Identified in the 2010-2014 ACS that Entered 1990-2014 with Numbers from the Office of Refugee Resettlement over the Same Period
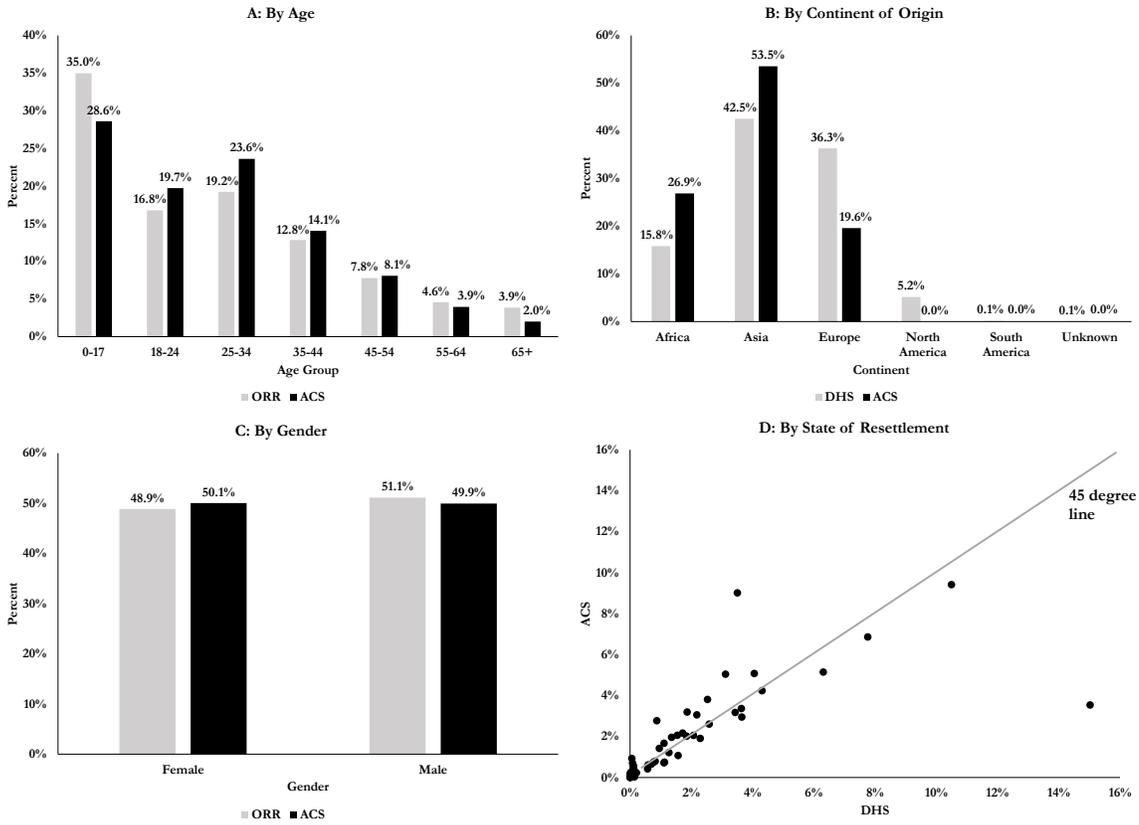

A: By Age

ORR / ACS by Age Group:
- 0-17: 35.0% / 28.6%
- 18-24: 16.8% / 19.7%
- 25-34: 19.2% / 23.6%
- 35-44: 12.8% / 14.1%
- 45-54: 7.8% / 8.1%
- 55-64: 4.6% / 3.9%
- 65+: 3.9% / 2.0%

B: By Continent of Origin

DHS / ACS by Continent:
- Africa: 15.8% / 26.9%
- Asia: 42.5% / 53.5%
- Europe: 36.3% / 19.6%
- North America: 5.2% / 0.0%
- South America: 0.1% / 0.0%
- Unknown: 0.1% / 0.0%

C: By Gender

ORR / ACS by Gender:
- Female: 48.9% / 50.1%
- Male: 51.1% / 49.9%
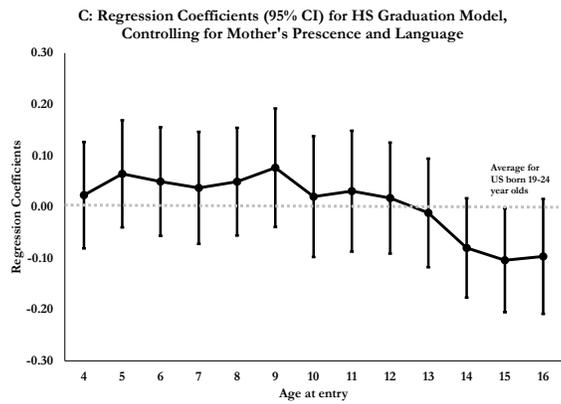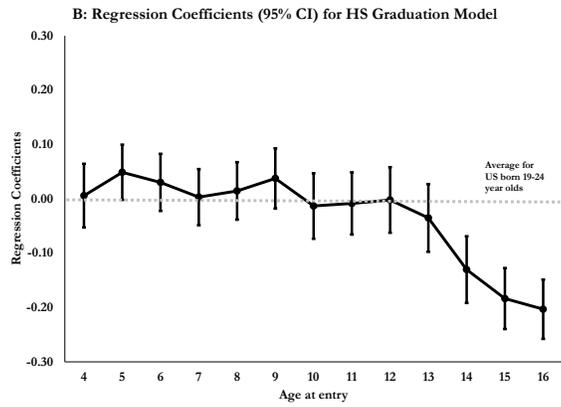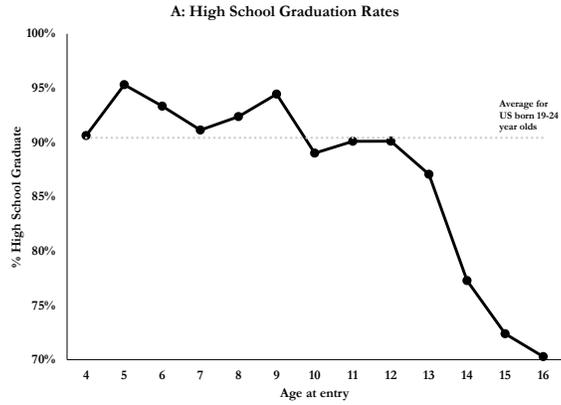
D: By State of Resettlement

45 degree line

Figure 3

High School Graduation Rates for Refugees Aged 19-24 in 2010-2014 ACS

By Age at Entry to the U.S.

A: High School Graduation Rates

B: Regression Coefficients (95% CI) for HS Graduation Model

C: Regression Coefficients (95% CI) for HS Graduation Model, Controlling for Mother's Prescence and Language

Figure 4
High School Graduation Rates for Refugees Aged 23-28 in 2010-2014 ACS
By Age at Entry to the U.S.

A: College Graduation Rates

B: Regression Coefficients (95% CI) for College Graduation Model

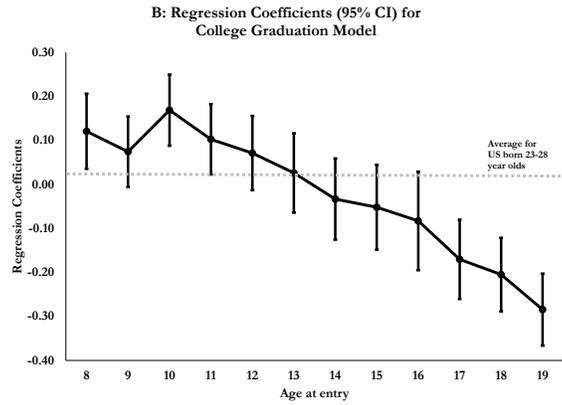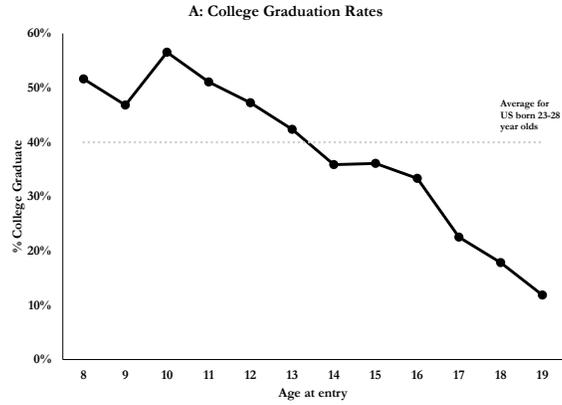**C: Regression Coefficients (95% CI) for College Graduation Model, Controlling for Mother's Prescence and Language**
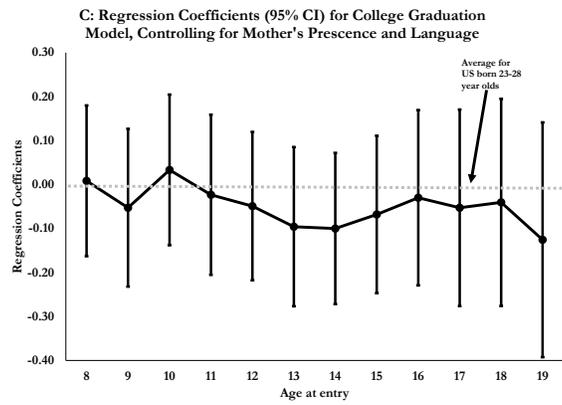
Figure 5

Characteristics of Refugees from 2010-2014 ACS that Arrived within 3 Years of the Survey,
By Age at Entry to the U.S.

**A: Percent of Refugees Entering With Poor English Ability
versus Age at Entry to the US**

**B: Percent of Refugees not Attached to a
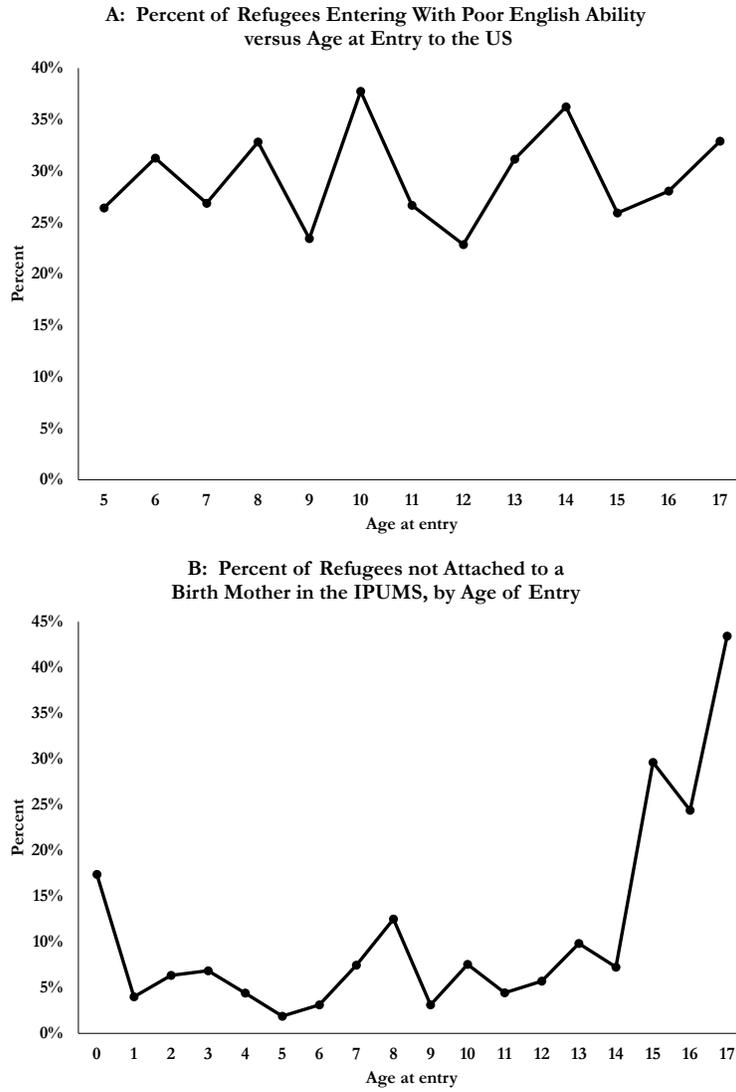Birth Mother in the IPUMS, by Age of Entry**

Figure 6
Impact of Age at Entry to the U.S. on Economic Outcomes (95% Confidence Interval)
For Refugees Aged 23-28, 2010-2014 ACS
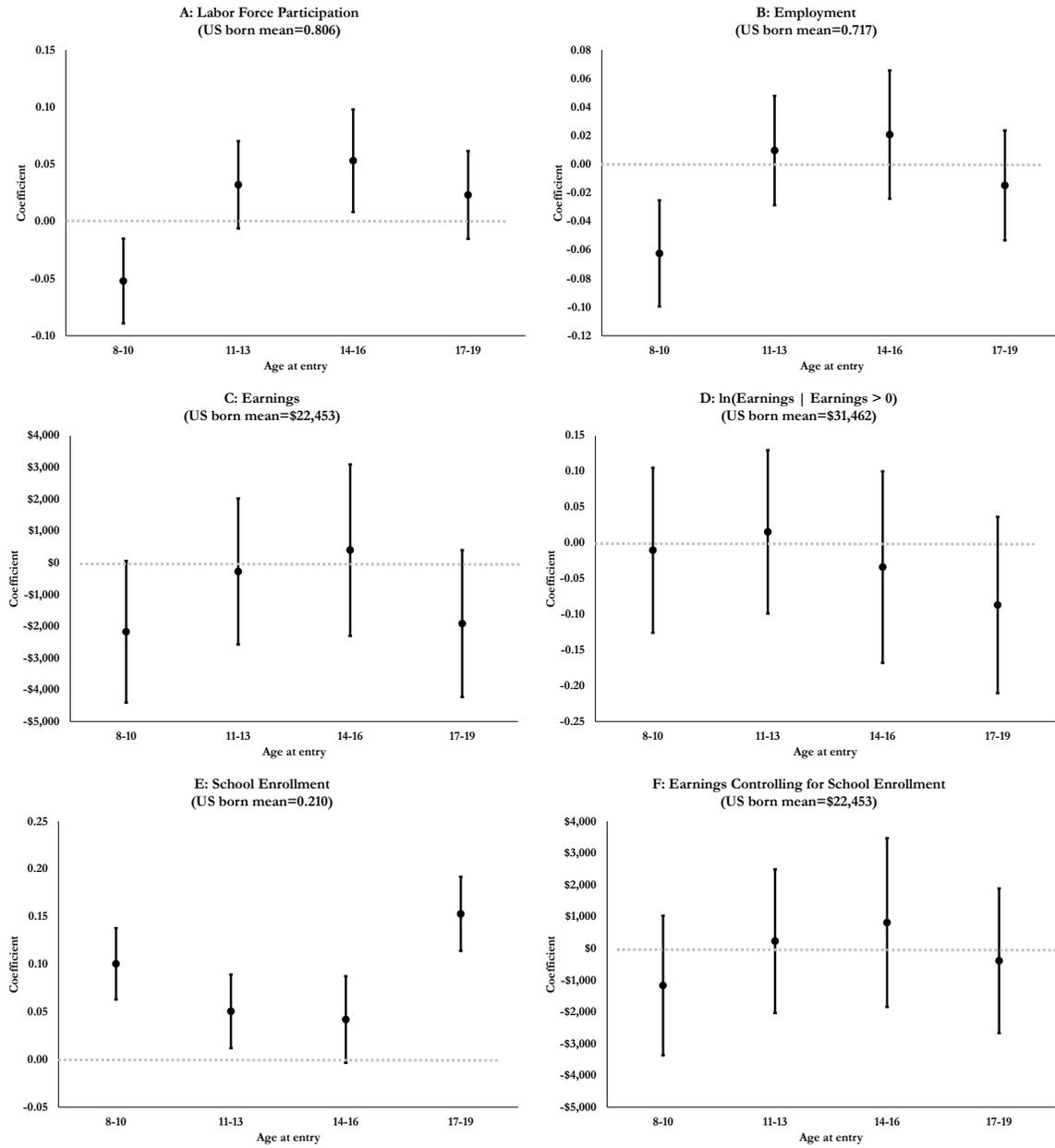
Figure 7

High School and College Graduation Rates for Refugees from 2010-2014 ACS,
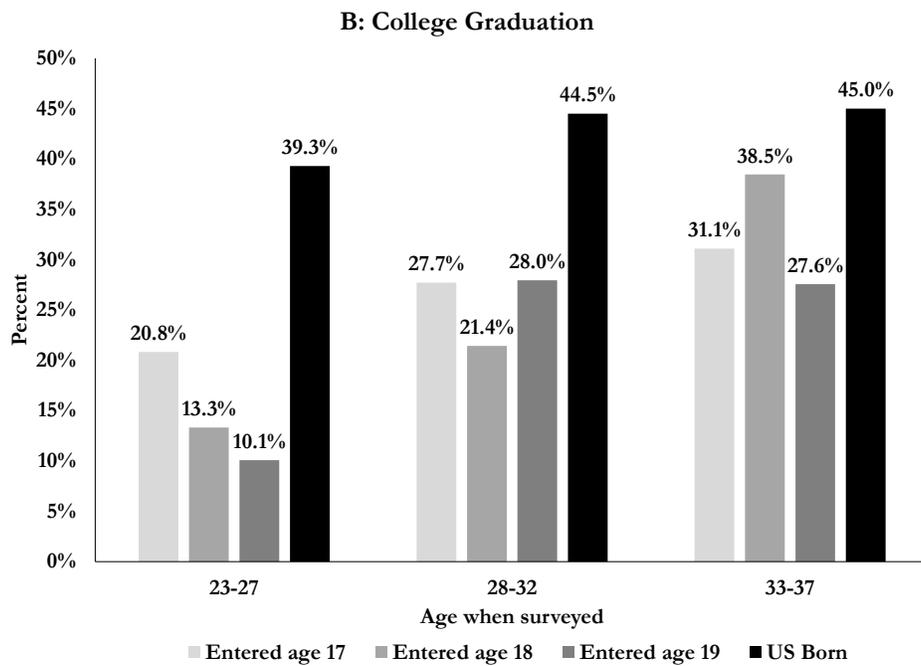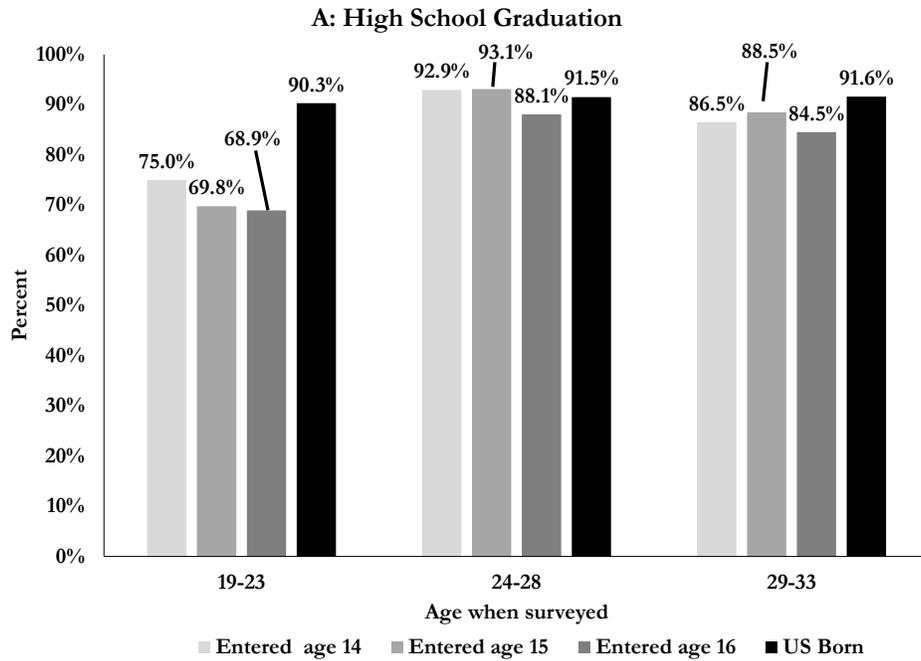By Age of Entry into U.S. and Age at Time of Survey

A: High School Graduation

B: College Graduation

Figure 8
Outcomes of Refugees that Entered the U.S. at Ages 18-45 as a Function of Years in the U.S., Compared to U.S. Born Adults, 18-65
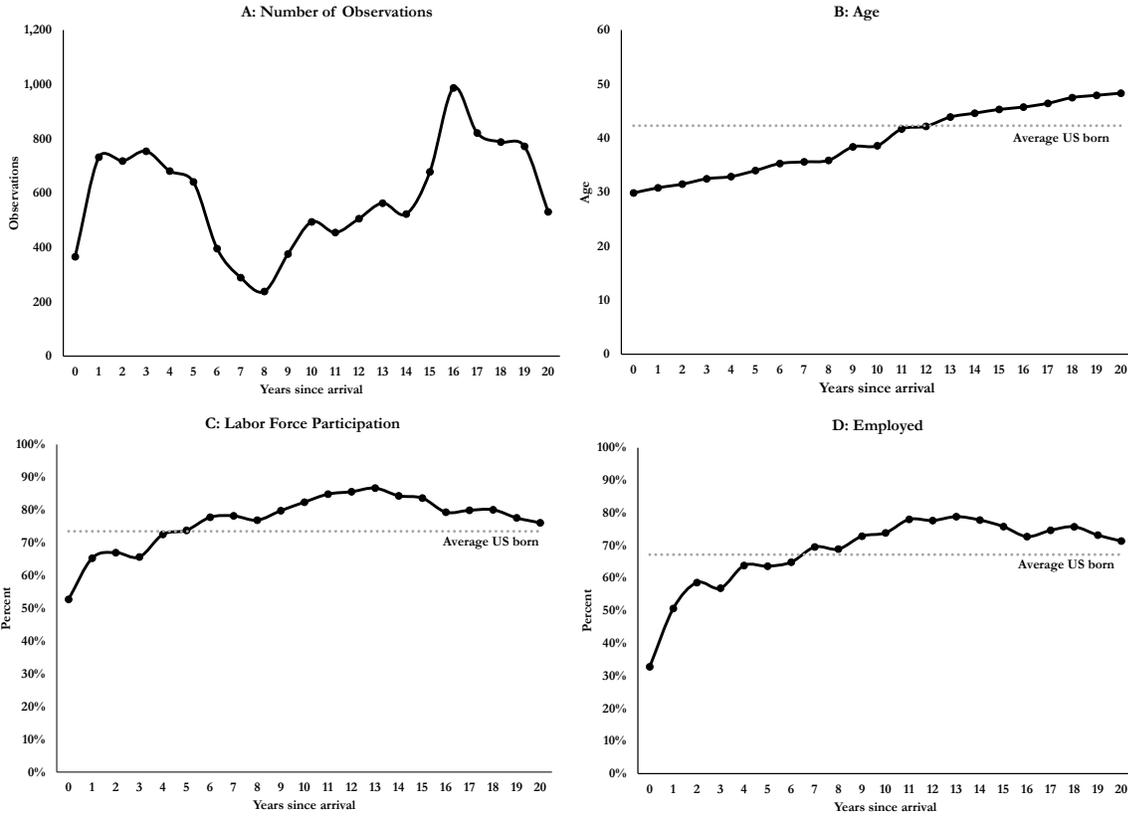
Figure 8 (Continued)
Outcomes of Refugees that Entered the U.S. at Ages 18-45 as a Function of Years in the U.S.,
Compared to U.S. Born Adults, Aged 18-65

E: Labor Earnings

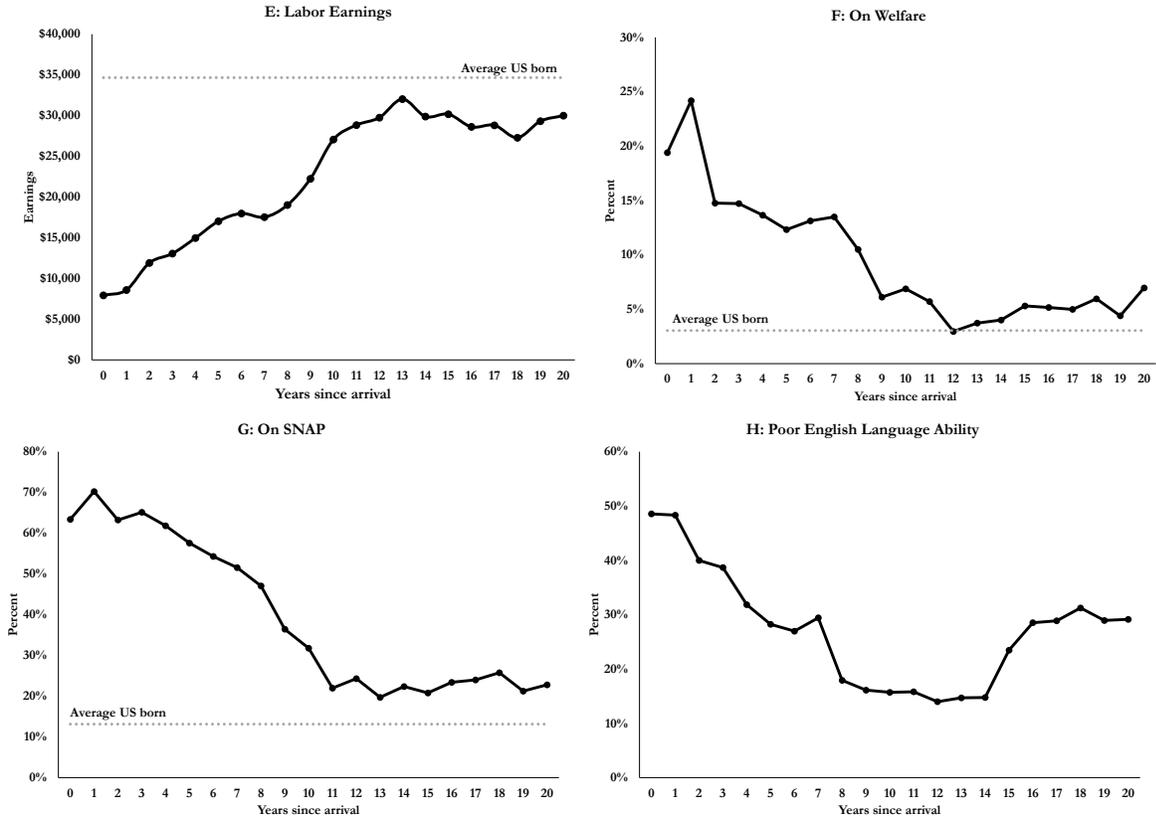F: On Welfare

G: On SNAP

H: Poor English Language Ability

Figure 9
Impact of Years since Arrival for Refugees that Entered the U.S. at Ages 18-45
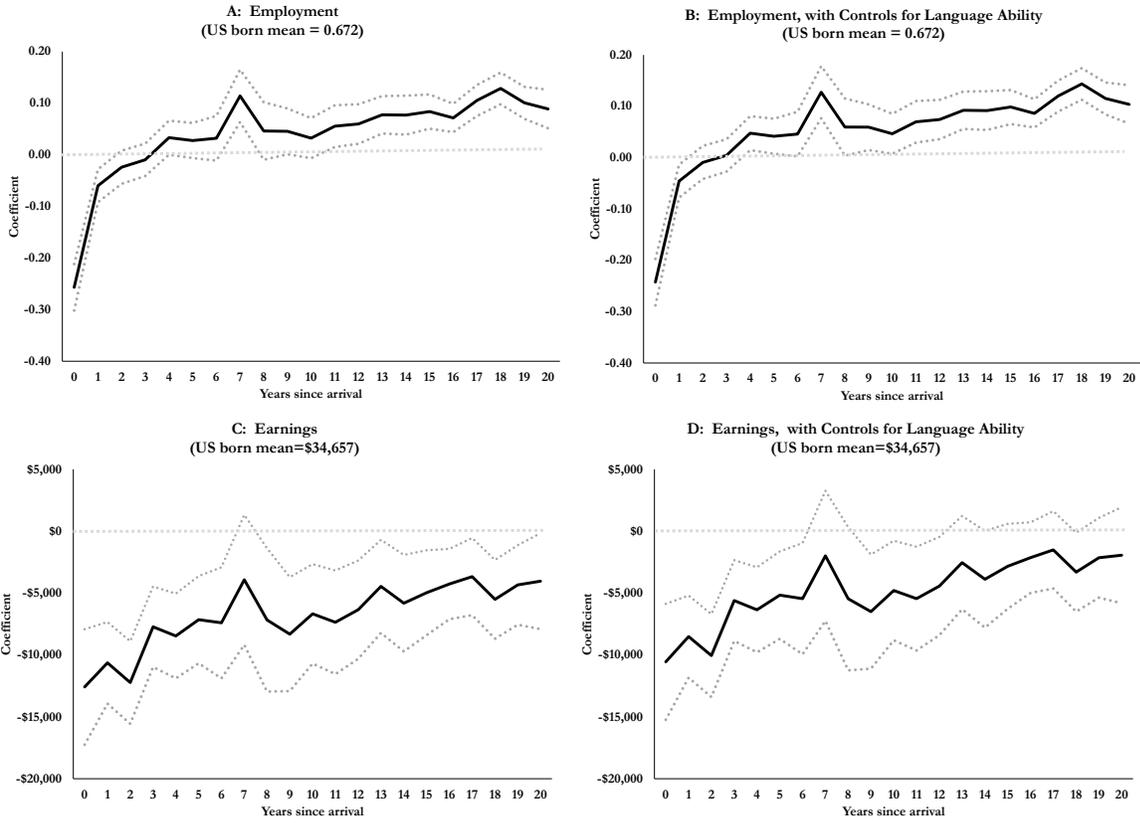Compared to U.S. Born Adults, Aged 18-65

Figure 9 (Continued)
Impact of Years since Arrival for Refugees that Entered the U.S. at Ages 18-45
Compared to U.S. Born Adults, Aged 18-65

E: On Welfare
(US born mean = .131)

F: On Welfare with Language Ability Controls
(US born mean = .131)

G: On SNAP
(US born mean = .131)

H: On SNAP with Language Ability Controls
(US born mean = .131)
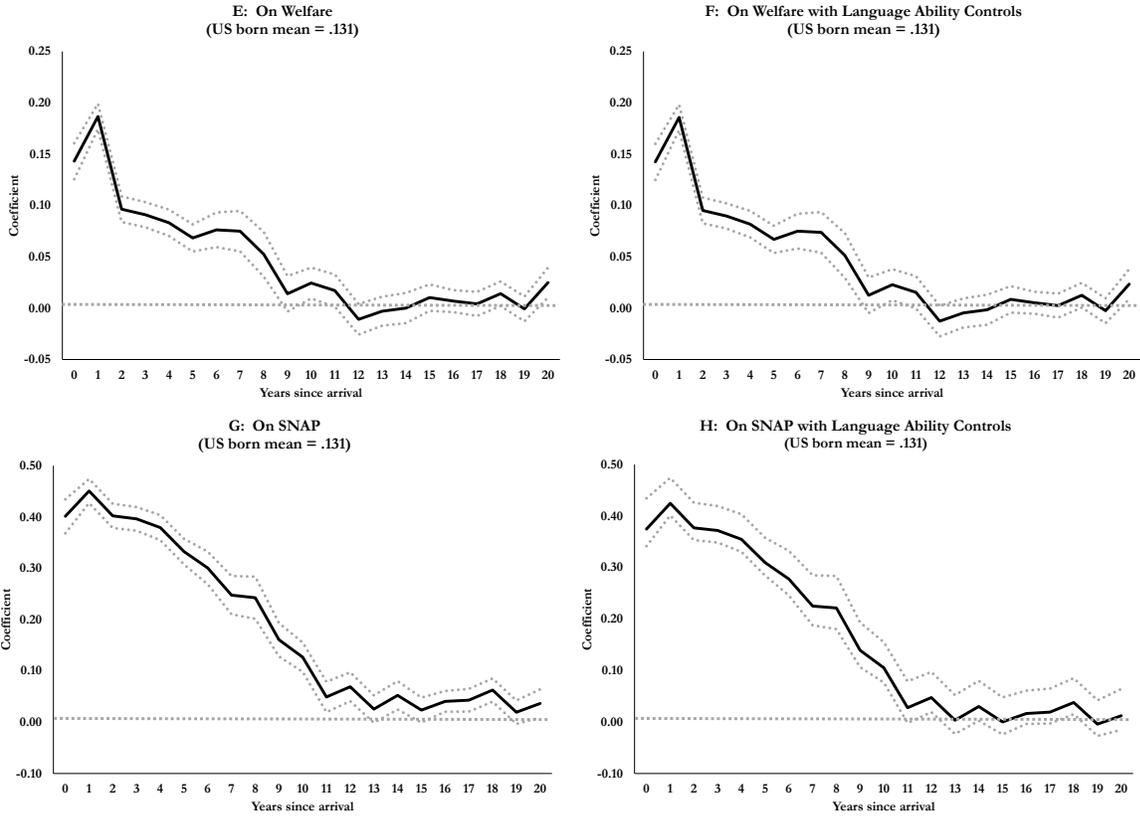
Figure 10

Estimated New Fiscal Costs of Refugees Aged 18-45 at Arrival by the Years Since Arrival

Net Costs per Year

Legend: Social insurance costs · · · · Tax revenues ── Net annual costs

X-axis: Years since arrival
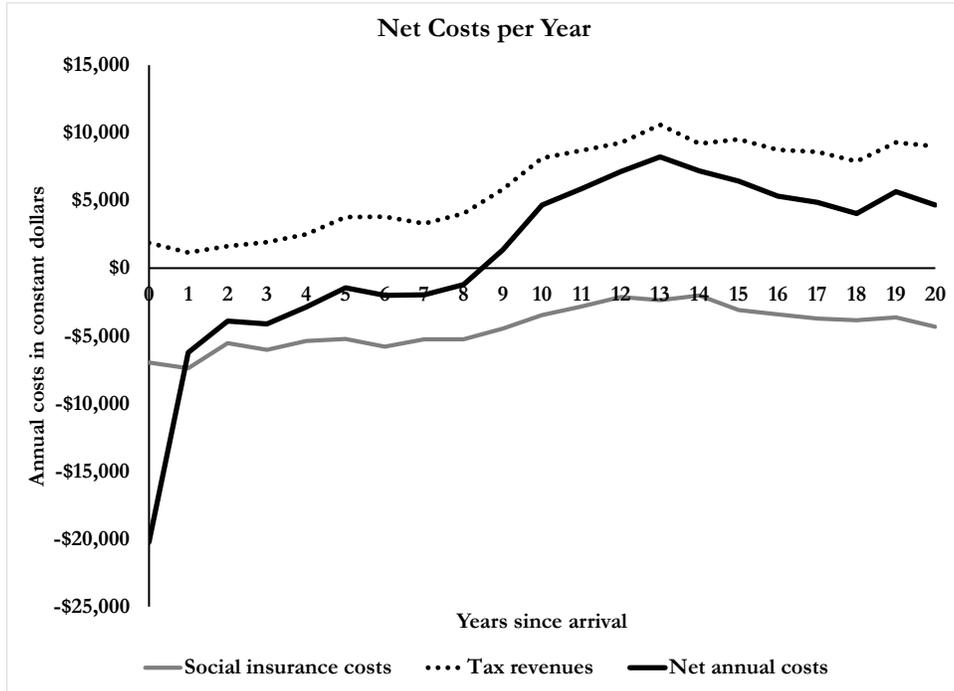Y-axis: Annual costs in constant dollars

Table 1
Refugees Represented in 2010-2014 ACS with
Refugee Concentration Ratio ≥0.7

COUNTRY (YEARS)
AFGHANISTAN (1991-92, 2001-03)
ALBANIA (1991)
AZERBAIJAN (2003-04)
BHUTAN (2008-14)
BOSNIA (1993-02)
BURMA (2007-14)
CAMBODIA (1990)
CROATIA (2000-01)
CZECHOSLOVAKIA (1990-91)
ERITREA (2007, 2009-10, 2013-14)
ESTONIA (2004)
ETHIOPIA (1990-93)
IRAQ (1992-95, 2001, 2008-11, 2013-14)
LAOS (1990-97, 2004-05)
LIBERIA (1993, 1999, 2001, 2004-06)
LIBYA (1991)
MOLDAVIA (2001, 2004)
SERBIA (1999, 2002-03)
SIERRA LEONE (2001, 2003-04)
SOMALIA (1992-98, 2000-01, 2003-14)
SUDAN (1994-95, 1998-06, 2012-14)
TOGO (1995, 2000)
VIETNAM (1994-95)
DEM. REP. OF THE CONGO (1993-94, 2000, 2004-14)

Table 2
Descriptive Statistics, 2010-2014 ACS

Variable	Means (Standard deviations)	
	Refugees, aged 4-16 at arrival, aged 19-24 at time of the survey	U.S.-born adults aged 19-24 at time of the survey
Age	21.6 (1.7)	21.3 (1.7)
% female	50.5 (50.0)	48.8 (50.0)
% with a high school degree	87.5 (33.1)	90.4 (29.4)
% with ≥ good English language skills	96.7(17.9)	99.6(6.3)
Sample size	1,366	1,036,474

Standard deviation in parentheses

Table 3
Descriptive Statistics, 2010-2014 ACS

Variable	Means (Standard deviations)	
	Refugees, aged 8-19 at arrival, aged 23-28 at time of the survey	U.S.-born adults aged 23-28 at time of the survey
Age	25.4 (1.7)	25.5 (1.7)
% female	49.7 (50.0)	49.6 (50.0)
% with a high school degree	87.6 (33.0)	91.4 (28.1)
% with a college degree	38.3 (48.6)	40.0 (49.0)
% w/ ≥ good English language skills	93.9(23.9)	99.6(6.0)
% in labor force	80.7 (39.5)	80.6 (39.6)
% employed	69.3 (46.2)	71.7 (45.1)
Labor earnings	$20,664 ($24,052)	$22,546 ($24,955)
Sample size	1,432	914,752

Standard deviation in parentheses

Table 4
Descriptive Statistics, 2010-2014 ACS

Variable	Means (Standard deviations)	
	Refugees, aged 18-45 at arrival, aged 18-65 at time of the survey	U.S.-born adults aged 18-65 at time of the survey
Age	40.1 (10.0)	42.3 (14.1)
% female	50.8 (50.0)	50.7 (50.0)
% with a high school degree	67.1 (47.0)	90.8 (28.9)
% with some college	37.3(48.4)	62.6(48.4)
% with a college degree	23.5(42.4)	36.7(48.2)
% with ≥ good English language skills	62.3(48.5)	99.7(5.3)
% in labor force	76.6 (42.4)	73.5 (44.1)
% employed	68.5 (46.5)	67.2 (46.9)
Labor earnings	$22,862 ($32,326)	$34,657 ($52,245)
% on welfare	9.3 (29.0)	3.0 (17.2)
% on SNAP	38.7 (48.7)	4.8 (33.8)
Sample size	12,309	8,166,161

Standard deviation in parentheses

Table 5
Summary of Fiscal Costs for Adult Refugees Aged 18-45 at the Time of Entry in the 2010-2014
ACS over Their First 20 Years in the U.S.

Relocation costs	Social insurance costs	Taxes Paid	Net Payment
-$15,148	-$92,217	$128,689	$21,324

Table 6
Sensitivity Analysis, Fiscal Costs of Resettling Adult Refugees

Row	Refugee ratio	Age range	Discount rate	# country/year pairs	# of obs. From ACS	Average NPV
1	0.7	18-45	2%	137	12,309	$21,324
2	0.7	18-45	4%	137	12,309	$10,004
3	0.7	18-45	0%	137	12,309	$28,065
4	0.7	18-29	2%	137	6,708	$33,241
5	0.7	30-45	2%	137	5,601	$4,619
6	0.6	18-45	2%	153	14,005	$27,929
7	0.8	18-45	2%	113	8,985	$14,891