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Abstract

Standard estimates based on the main household survey used to shed light on labor markets –the Current Population Survey (CPS)– suggest that after a significant drop during the pandemic, recent rapid growth has brought the foreign-born population back to, or above, levels predicted by the pre-pandemic trend. However, we document that the weighting factors used to make the CPS nationally representative have recently displayed some unusual movements and conclude that standard estimates of the foreign-born population may currently be too high. We also show that recent labor market indicators are inconsistent with increased foreign-born induced slack.

1 Labor markets and the pandemic rebound

Between 2010 and 2019 the growth of CPS estimates of foreign-born population was steady, averaging 0.75 million per year. Estimates of the immigrant population began to decline in 2019, however, and slid further with the pandemic. This led to a 2 million shortfall in the working-age foreign-born population relative to its trend by the end of 2021 (Peri and Zaiour (2022)).[1] However, in recent months the CPS[2] shows a surge in immigration. Following

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[1]Recent analysis and commentary focuses on links between immigration and the post pandemic labor market. For example, Duzhak (2023) investigates the link between the V/U ratio (vacancies relative to unemployment) and net international migration. GoldmanSachs (2023) research notes that, “The foreign-born labor force has made a disproportionate contribution to reducing the jobs-worker gap. This has been driven by two factors: above-trend immigration growth and greater foreign-born labor force participation.” Krugman (2023) concurs in “How Immigrants are Saving the Economy.”

[2]We access the CPS at www.ipums.org; see Flood et al. (2022).

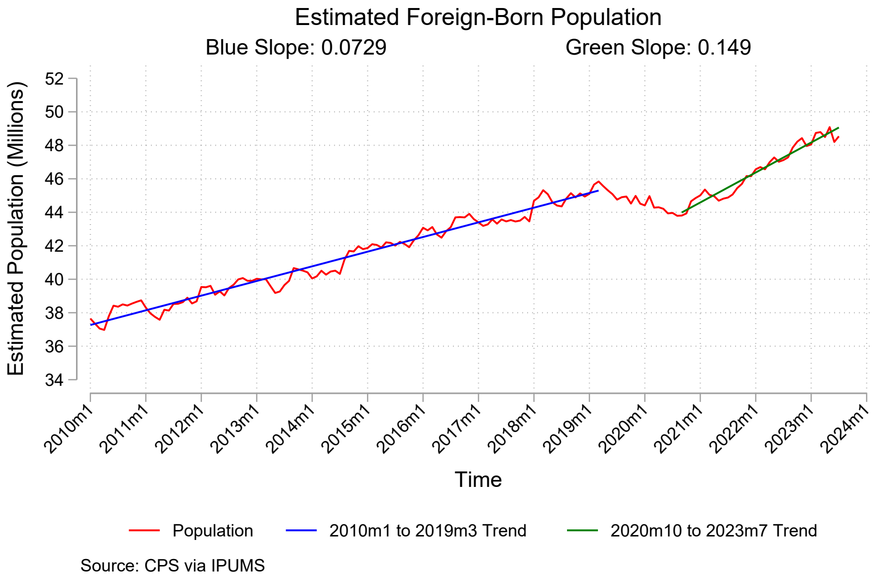


Figure 1: CPS estimated foreign-born population, with trends.

the 2019-September 2021 fall, the foreign-born population began growing at 1.5 million per year, twice the pre-2019 trend's rate (see Figure 1).[3] The remarkable growth in the foreign-born population of the last two years has been enough to put the aggregate foreign-born population number back where it would have been had the pre-2019 growth trend continued until today.

2 Sampling and weights in the CPS

Challenges in collecting surveys have increased in recent years (Meyer et al. (2015)). They have been exacerbated by the pandemic (TheEconomist (2023)). Rothbaum and Bee (2021), in their paper titled "Coronavirus infects surveys, too: Survey nonresponse bias and the coronavirus pandemic", point out that the CPS suffered from considerably more non-response during the pandemic, and that this has important implications for sampling weights.[4] Here we explore the CPS sample and weights with a focus on estimating the foreign-born population.[5]

The CPS is a nationally representative monthly survey of the U.S. population based on a rotating panel of approximately 60 thousand households (and a response rate of around eighty five percent); each spends four months in the sample, eight months out, and four

[3] We define "foreign born" based on citizenship status rather than on country of birth. The foreign born are non-citizens or naturalized citizens, and exclude those born abroad to American parents. Including those born abroad of American parents in the "foreign born" group, the changes are very similar, but the levels are higher.

[4] Rothbaum and Bee (2021) focus on the ASEC sample and propose alternative weights to account for the special nature of non-response during the pandemic. Using these alternative weights, they estimate a smaller 2020 foreign-born population than using the standard CPS weights. Mira and Bollinger (2021) estimate foreign-born population ranges that take into account the added uncertainty from item non-response in the CPS.

[5] We accessed the data from www.ipums.org, and the weight referred to is the final basic weight *wtfinl*.

months in again. Under the sampling frame used by the Census Bureau, every respondent in the survey is assigned a weight, corresponding to the number of U.S. residents the individual represents.[6] The average CPS respondent in July 2019, for example, represented 2765 people. Summing the weights of all survey respondents, one obtains the Census Bureau's estimate of the U.S. (non-institutionalized) population.

Designing the weights is complicated and a thorough description is beyond the scope of this publication.[7] Briefly, the CPS creates weights to hit demographic population numbers within states. Importantly, neither birthplace nor citizenship are among the traits targeted in the design of the weights. Therefore, unexpected changes in the response rate –for example, between the foreign born and the native born during the pandemic– have the potential to lead to changes in the population counts of these groups.

3 Modeling CPS weights

To explore the role of the weights in estimating the size of the foreign-born population we estimate a rich linear model of the individual-level weights as a function of age group, sex, and race/Hispanic ethnicity[8] interactions with survey rounds, rotation groups, and states. The data include all respondents between January 2010 and June 2023 (19.8 million observations). The model allows the mean for each age group-sex group-race/Hispanic ethnicity group cell to vary by state (3570 fixed effects), by survey round (11270 fixed effects), and by rotation group (560 fixed effects).[9]

Our model explains 78 percent of the variation in individual sample weights. The remaining 22 percent reflects additional subtleties in how the BLS computes weights. This is because the probability of being sampled into the CPS is not the same for every household, and because households that are sampled differ in the probability with which they comply with the survey request. In the absence of corrections the BLS undertakes, these features

[6] For more details see CensusBureau (2019).

[7] The CPS uses a state-by-state two-stage probability sample design. First, BLS divides the country into primary sampling units (PSUs), each consisting of a metro area or an adjacent group of counties. BLS then groups these PSUs into strata based on demographic and labor force similarity and picks at random a PSU from each strata. The BLS uses the number of unemployed men and women, the number of families with a female head, the number of households with three or more people, and additional industry and wage variables for stratification. In a second stage, the BLS picks at random a set of household units (HUs) from the selected PSU for interview. Each HU is assigned to a rotation group, and rotation groups are interviewed in a staggered fashion as follows: four consecutive interview months, eight consecutive non-interview months, and a final four consecutive interview months. The BLS assigns a base weight to each household and to each individual within a household to make each of the rotation groups nationally representative. This base weight is proportional to the household's probability of selection within its state. The base weight is adjusted in a first step to account for non-response. The adjustment entails redistributing the weights of the non-respondents among respondents from PSU clusters with similar demographic characteristics. In a series of additional steps, the CPS adjusts the weights to more accurately reflect features of the joint distribution of race/Hispanic ethnicity, age, and sex at the state, national, and within rotation group levels.

[8] We assign each respondent to a unique population-group category among the following: non-Hispanic white, non-Hispanic black, non-Hispanic Asian or Pacific Islander, Hispanic, and other non-Hispanic.

[9] The model takes the form $\omega_{it} = \delta_{race_i,age_i,sex_i,state_i} + \gamma_{race_i,age_i,sex_i,rotationgroup_i} + \eta_{race_i,age_i,sex_i} t + \epsilon_{it}$, where ω_{it} is the weight of respondent i in survey round t.

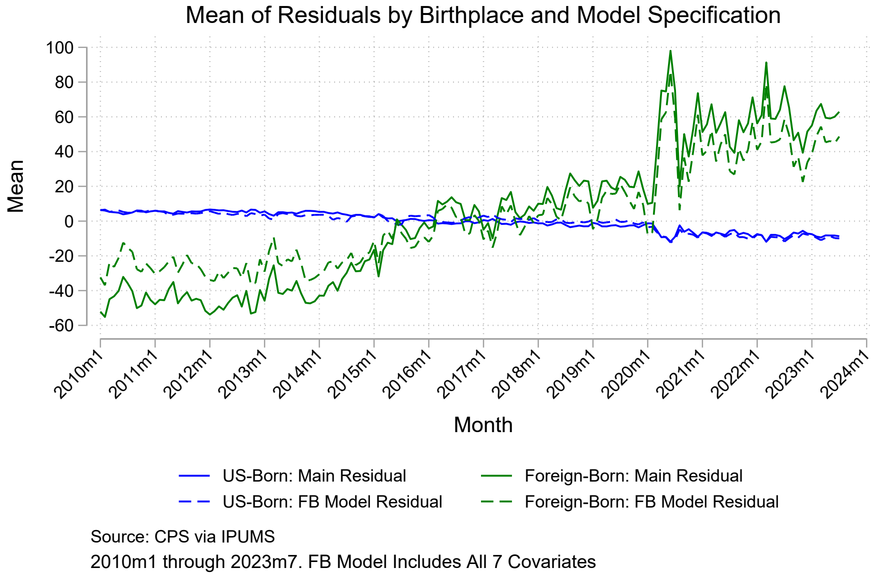


Figure 2: Average residuals from the model for the CPS weights.

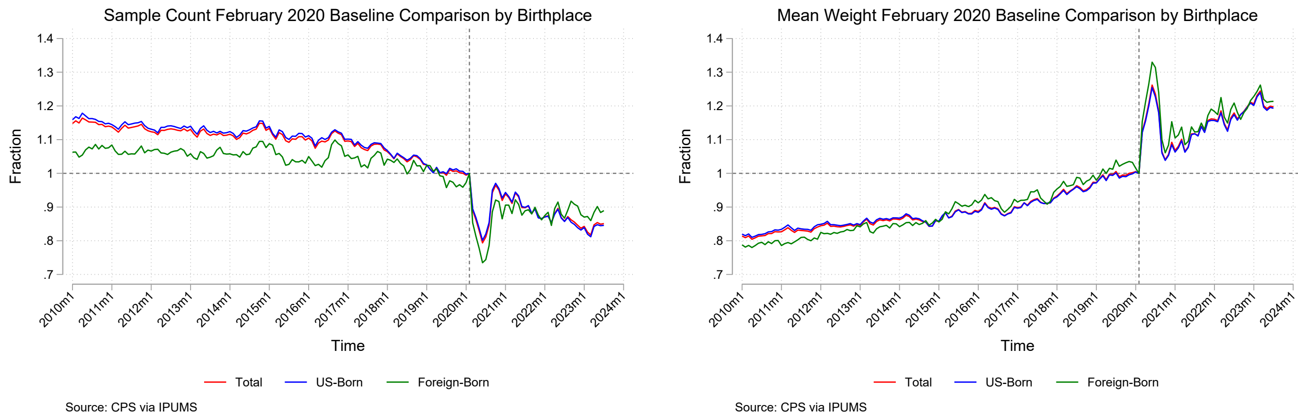
would make the CPS sample un-representative of the U.S. population. More generally, the residuals from our model capture additional information used by the BLS for weight assignment beyond what we can observe in the data. We take a closer look at these residuals, particularly their behavior in relation to foreign-born status, in Figure 2.

The solid lines plot the average residual among the foreign born and the U.S. born. Two remarkable patterns are apparent: first, a general increase over time in the average residual in the weights among the foreign born (green line). Prior to 2015 the average foreign-born weight was much lower than our basic model predicts. After 2017, the opposite is true. Remarkably, the positive mean residuals among the foreign born became much larger after the pandemic shock of early 2020. The sharp jump in the mean residual around February 2020, as we will see below, corresponds to the large loss in respondent sample size[10] that the CPS suffered with the pandemic lockdowns (see IPUMS (2023)). Second, we see a pandemic spike in the mean residual for the foreign born that did not return to its previous level. The pandemic, effectively, led to a structural break in the mean weights for the foreign born.[11] Thus, the CPS is now giving foreign-born individuals with the same demographic characteristics (sex, race, age, location) a much higher weight than it did pre-pandemic.

To try to better understand this change, we estimated a second model that includes a host of additional characteristics as predictors: education level, family size, marital status, industry of employment, occupation, metropolitan area, and county. The dashed line in Figure 2 plots the mean residuals of this expanded model. While including these additional variables explains a considerable fraction of the residual variation in foreign-born weights before 2014,

[10] Throughout we will refer to the respondent sample size simply as the sample size.

[11] The slight negative trend in the mean residual among the U.S. born simply reflects an adding-up constraint; our model, by construction, imposes an overall mean residual of zero.



(a) CPS respondent sample sizes **(b)** CPS mean weights

Figure 3: Average weights and sample sizes in the CPS since 2010, relative to Feb. 2020.

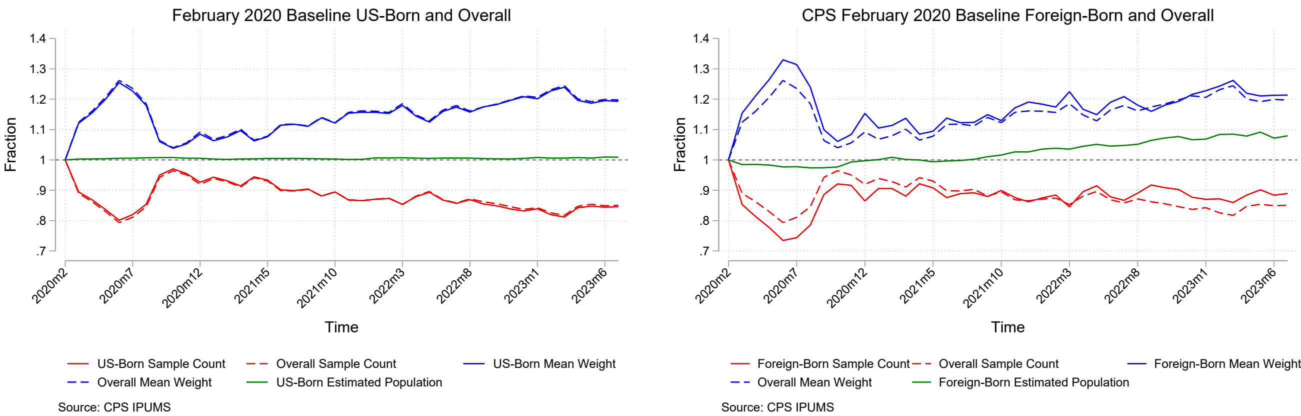
they barely change the mean foreign-born residuals in the post- pandemic period.[12] Based on observable characteristics (both those used and not used in the assignment of CPS weights), we cannot account for the larger weights assigned to the foreign born in the post-pandemic period.

4 Sample size and respondent weights

Because the CPS is a nationally representative survey, individual-level weights are closely related to the survey's number of respondents. In panel (a) of Figure 3 we show the sample sizes[13] for US-born (blue), foreign-born (green), and for the overall population (red) since 2010, relative to the sample sizes in February 2020, right before March 2020 when the national health emergency was declared. As a result of increased non-response, the overall sample size was 15 percent larger in 2010 than in early 2020. Today, it is 15 percent smaller than it was in early 2020.

Beyond the general downward trend, the pandemic was a major blow to the CPS's number of respondents. In June 2020 the U.S.-born number of respondents was 20 percent smaller than it was in the February 2020 round, while for the foreign-born it was 25 percent smaller. The Census Bureau had to drastically increase the weights to account for such a loss of respondents (see the spike in panel (b)). As a simple adding-up constraint, to make sure the smaller samples still reflect the overall features and size of the U.S. population, the average weight must be growing over time: with a growing population and a shrinking sample size, each survey respondent represents more U.S. residents. Panel (b) of Figure 3 plots the mean weights for U.S. born (blue), foreign born (green), and the overall population (red) since 2010, once again relative to February 2020.

[12]The additional variables appear to start having some explanatory power towards in the most recent months.
[13]In what follows we refer to the number or individuals responding to the survey as the sample size.



(a) U.S. born **(b)** Foreign born

Figure 4: Average weights and sample sizes in the CPS, relative to Feb. 2020.

The figure reveals a key pattern: from early 2021 onwards, the CPS sample size trends for U.S. born and foreign born have behaved very differently. By October 2020 the sample size had rebounded to 95 and 92 percent of the February 2020 size, for the U.S.- and foreign-born, respectively. But since then, the U.S.-born sample size has been falling faster than in the pre-pandemic period, and is now only 85 percent of its February 2020 size (blue line in panel(a) of Figure 3). The foreign-born sample, in contrast, has remained relatively steady at around 90 percent of its February 2020 size (green line in panel (a) of Figure 3). In practice, these two different trends have led to a re-composition of the CPS sample: prior to the pandemic, the foreign-born represented, on average, 12 percent of the respondent sample. Today, they are more than 13 percent of it.

While the post-pandemic rebound of the U.S.-born and foreign-born sample sizes has been very different, the evolution of the mean weights for both groups has been very similar, as seen in panel (b) of Figure 3. Because the sample sizes have behaved so differently, while the mean weights have behaved so similarly, the implied mean weight changes in response to sample size changes have also been very different.

In Figure 4 we home in on the joint behavior of sample sizes and mean weights starting in February 2020, right before the lockdown. Panel (a) plots the mean weights (blue), sample size (red), and the U.S. born population (green). Panel (b) plots the same statistics for the foreign-born population. In both panels the dashed lines plot identical numbers for the overall population for reference. We plot all series relative to their February 2020.

The blue lines in panels (a) and (b) show that both the U.S.-born and the foreign-born mean weights behave similarly; they both closely track the variation over time in the overall mean weight. The red lines show, in contrast, the distinct path of the foreign-born sample size. The different path of the foreign-born sample size, together with the relatively similar behavior of the mean weights of both groups over time, implies a steeper path for the foreign-born estimated population (the green line in panel (b)). Between March and December 2020 the foreign-born sample size fell proportionately more than the US-born sample size, while its mean weight did not adjust in the same proportion. Starting in 2021, the U.S.-born sample size kept trending down and its mean weight kept growing. The foreign-born mean weight has followed this U.S.-born mean weight trend, although the foreign-born sample has remained steady over this period. This suggests the CPS foreign-born population estimates may be too low at the beginning of the pandemic, and too high today. An estimate of the foreign-born population that is too low early in the pandemic, and too high later on, will imply an increase in the foreign-born population growth that may not be warranted.

4.1 Weight elasticity-adjusted alternative estimates

The discussion above leads us to consider the following thought experiment: what would the implied foreign-born population be, had the average weights for the foreign-born responded to foreign-born sample size changes in the same way that the U.S.-born weights responded to the changes in the U.S.-born sample size? To do this we compute a "weight elasticity" as the growth rate of the mean weight for a population group divide by the growth rate of the sample size for that group between any survey month and a baseline period (which we choose to be February of 2020). When the elasticity for the foreign born is larger than the elasticity for the U.S. born, for example, a given percentage decrease in the foreign-born sample size translates into a larger percentage growth in the average weight of the foreign born, than the percentage growth in the average weight of the U.S. born in response to the same percent decrease in the U.S.-born sample size.

Consider the sharp fall in the sample size between February and June 2020. As panel (a) of Figure 4 shows, the U.S.-born sample size fell 20 percentage points. In response, the mean weight for this group increased 25 percentage points, for an elasticity of 1.25. Panel (b) illustrates that in the same period, the foreign-born sample size fell by 25 percentage points. The mean weight for this group increased 32 percentage points, for an elasticity of 1.28. If the responsiveness of the mean foreign-born weight had been the same as the one for the U.S.-born, the mean weight would have increased 31.25 percentage points, close to the 32 percentage points that it actually increased. In contrast, consider the end point of our data series. After the sharp pandemic fall and partial recovery of the CPS's sample, in June 2023 the U.S.-born sample was only 85 percent its February 2020 size. Correspondingly, the mean weight for this group was 20 percentage points higher than in February 2020 for an elasticity of 1.33. During the same period, the foreign-born sample shrank 12 percentage points. Its mean weight grew 21 percentage points compared to February 2020, for an elasticity of 1.75. If the responsiveness of the mean foreign-born weight had been the same as the one for the U.S. born, the mean weight would have increased only 16 rather than 21 percentage points, a substantially lower increase.

We use these elasticities month to month to compute an alternative foreign-born population series, under a scenario where the foreign-born weights change in the same proportion to

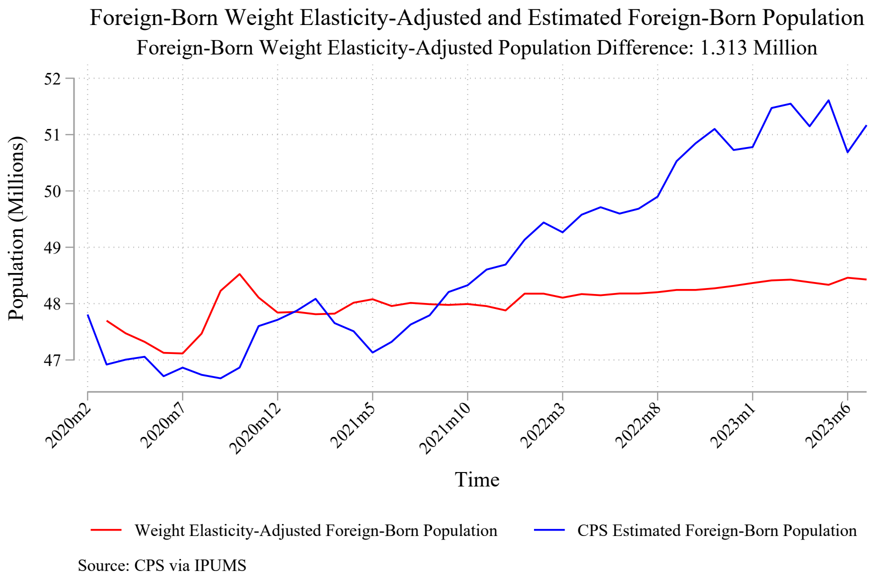


Figure 5: Comparison exercise: weight elasticity-adjusted estimates of the foreign born population.

changes in the sample size as the U.S. born weights did (see Appendix A for the mathematical details). In Figure 5 we plot this alternative foreign-born population for the post-pandemic period (red) and compare it to the CPS estimated foreign-born population (blue). Under this scenario, the estimated early-pandemic fall in the foreign-born population would have been slightly smaller, and its estimated growth after May 2021 would have been considerably slower. The net effect of a smaller fall in the foreign-born population early in the pandemic, and a smaller growth later on would imply a net growth of the foreign-born population in this period of 1.3 million, in sharp contrast with the CPS's 4 million estimate.

Of course, we are not claiming that the responsiveness of the weights for the foreign-born to sample size changes should have mimicked the one for the U.S. born.[14] The exercise is not intended to provide a new estimate of the foreign-born population growth. It is only intended to highlight that the sharply distinct behavior of the foreign-born weights in this period plays an important role in the resulting population estimates from the CPS.

5 Alternative sources

5.1 Bounding exercise

We also implemented a bounding exercise using data from the Department of Homeland Security and a series of assumptions. We use numbers of new immigrant visa holders, of non-immigrant visa holders, of apprehensions at the border, and of new asylum and refugee claimants, to estimate the net change in the foreign born over the 33 months between October

[14] This would only be the case if we believed that U.S.-born and foreign-born populations are growing at the same rate.

Panel A: CPS and Model Foreign-Born Population Change (Thousands)

4-Month Period	Immigrant Visas	Non-Immigrant Visas	Appre-hensions	Inadmissibles	Asylees	Refugees	Deaths	Model Change in FB Pop.	CPS Change in FB Pop.
Oct 2020 - Jan 2021	42	544	38	72	9	4	100	-18	-1
Feb 2021 - May 2021	86	924	212	79	6	4	99	114	1425
Jun 2021 - Sep 2021	171	1328	371	112	6	4	99	285	-542
Oct 2021 - Jan 2022	143	1538	309	119	4	4	99	227	877
Feb 2022 - May 2022	167	2438	398	162	6	6	99	311	1009
Jun 2022 - Sep 2022	207	2851	454	222	6	6	99	384	318
Oct 2022 - Jan 2023	181	3034	505	286	6	6	99	386	1201
Feb 2023 - May 2023	218	3917	371	359	6	6	100	367	519
Jun 2023	52	955	101	111	2	2	34	85	-537
Total	1267	17529	2758	1522	53	42	827	2142	4268

Panel B: Model Parameters

Parameter	Immigrant Visa Stay Rate	Non-Immigrant Visa Stay Rate	Border Apprehension Stay Rate	Inadmissible Stay Rate	Asylum Stay Rate	Refugee Stay Rate	Death Rate
Value	1	0.0121	0.5	0.01	1	1	0.00225

Table 1: Bounding Exercise: Inflows-outflows of foreign born. Sources: DHS, CDC, CPB.

2020 and June 2023. Some of our assumptions may be heroic, but we can bound these as well: we assume 100 percent of those obtaining immigrant visas stay. Based on DHS (2021), we assume 1.2 percent of non-immigrant visa holders stay. "Inadmissibles" are cases of individuals deemed as qualifying for expulsion under Title 42, so we set 1 percent as the fraction of those who stay in the U.S. We assume 100 percent of asylum seekers and refugees stay. We use the overall U.S. death rate of 9 per 1000 to estimate deaths among the foreign born.

Most people who enter the U.S. unlawfully do so after thwarted attempts by border enforcement (Lopez et al. (2021)), so we define the "stay rate" as the fraction of these individuals who successfully cross over into the U.S. We have considerable uncertainty over this parameter, however. Because of this uncertainty, our bounding exercise computes estimated net flows for a range of values for it. We compute the estimated total net flow of foreign born since October 2020 under values for this rate ranging from 10 to 100 percent.[15] In Table 1 we present four-month total numbers for each of these flows from October 2020 onwards for the case of an apprehension stay rate of 50 percent.[16] Under this scenario, the net increase in the foreign born is just above 2.1 million people.

In Figure 6, we then report the estimated total net flow of foreign born since October 2020 under values for the 'stay rate' ranging from 10 to 100 percent. In the limit scenario where the stay rate of the apprehended is only 10 percent, the net foreign-born increase is less than a million. In the opposite case of a 100 percent rate, it rises to 3.5 million. Not even under this extreme scenario can we generate a net flow near the 4 million that we estimate in the Current Population Survey. Even under our most generous assumptions, the DHS numbers are 500 thousand lower than CPS estimates.

5.2 Contrast with the ACS

Other sources of information are consistent with the view that the foreign-born population may be overestimated in the CPS. In Figure 7 we compare the estimates for the number of recent immigrants (within the last year) in the CPS and in the American Community Survey over the last twelve years.[17] In the majority of years the estimates are quite similar, but 2020 and 2021 are the farthest off of the 45-degree line. For 2021, the ACS estimates three

[15] A 10 percent rate would imply that for every 100 unlawful entrants, 10 of them stay in the U.S. A 100 percent rate would imply that all 100 of them stay in the U.S.

[16] We exclude emigration numbers for the foreign born for which we do not have estimates. Naturally, this will only make our estimated numbers higher than they otherwise would be.

[17] The ACS has a much larger sample size, but is released annually. As of this writing, the 2022 data have not been released. In order to define "recent" immigrant across years and data sources as consistently as possible, we consider those who have come within the last year. In the ACS, this can be defined directly since respondents can report that they came within the last year. In the CPS, respondents report in which window of years they arrived. The size of this window is not consistent across years. Therefore, we calculate the number of recent immigrants in a given year as the difference in the number of people who say they arrived in the most recent window between January and December. As a caveat, the way we measure recent immigrants in the CPS is based on a completed year of responses whereas the ACS is collected over the course of the year. In periods of rapid immigration, one might expect the CPS numbers to be higher than the ACS numbers just for this reason.

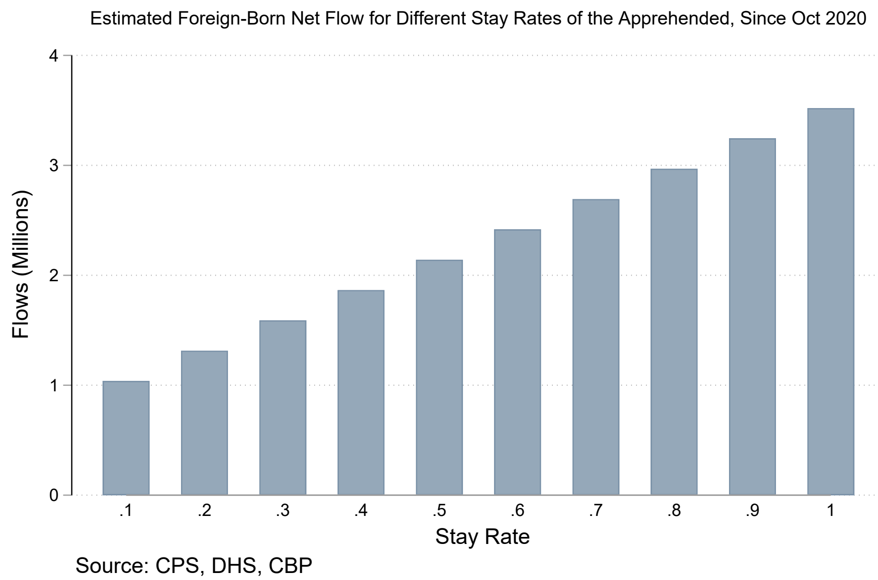


Figure 6: Inflow-outflow bounding exercise: range of net foreign born increase since Oct. 2020 for various rates of stay of the unlawfully present apprehended.

quarters of a million new immigrants, while the CPS reports 1.5 million.

5.3 Evidence from labor markets

Evidence from the labor markets is complementary to the foregoing evidence of an overcount of recent immigrants. Labor markets continue to be very tight, and particularly so in industries where the labor force was immigrant intensive prior to the pandemic. Here we explore the evidence from labor force participation rates and cross-industry employment patterns.

5.3.1 Labor market tightness

The rapid increase in CPS working-age foreign-born population during the post pandemic period, together with the considerably higher participation rate of this group, would suggest, all else equal, that industries with the largest shares of foreign-born employment should be experiencing less acute labor market tightness. We explore this in two ways. First, we rely on Davis et al. (2012), who propose an industry-level measure of labor market tightness, that they call recruiting intensity."[18] We estimate recruiting intensities for broad categories of industries (the 2-digit NAICS[19] level), before (2017-18) and after (Jun 2022-June 2023) the pandemic and compare them to the average pre-pandemic industry-level foreign-born employment shares. Panel (a) of Figure 8 presents this exercise as a scatter plot, where we

[18] Recruiting intensity is the product of an industry-level fill rate elasticity estimated in Davis et al. (2012), and the log of hires in the industry.

[19] North American Industry Classification System.

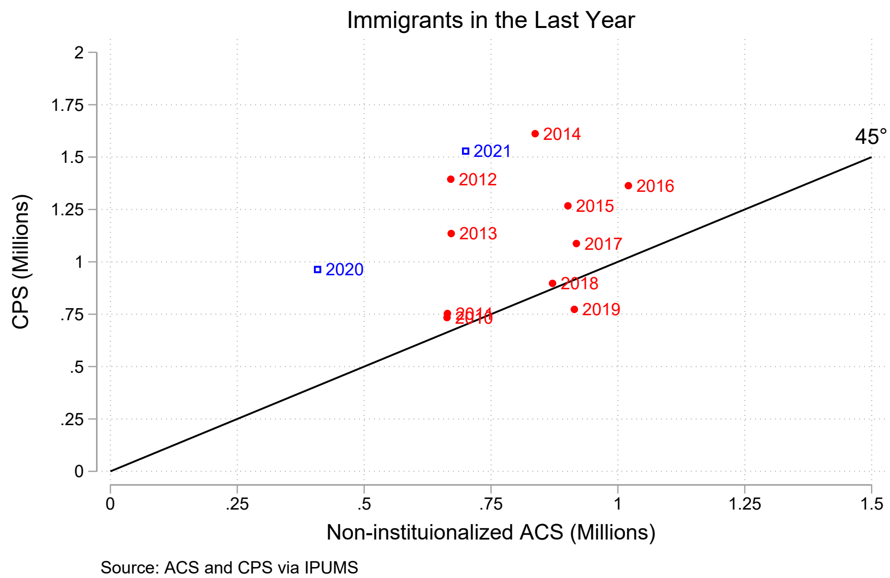


Figure 7: CPS vs. ACS estimated recent (within the last year) immigrant population.

plot the post to pre-pandemic growth rate in the recruiting intensity against the foreign-born employment share. Across the board, changes in the recruiting intensities have been quantitatively minor. Moreover, there is no significant differential change in labor market tightness in the most foreign-born intensive industries.

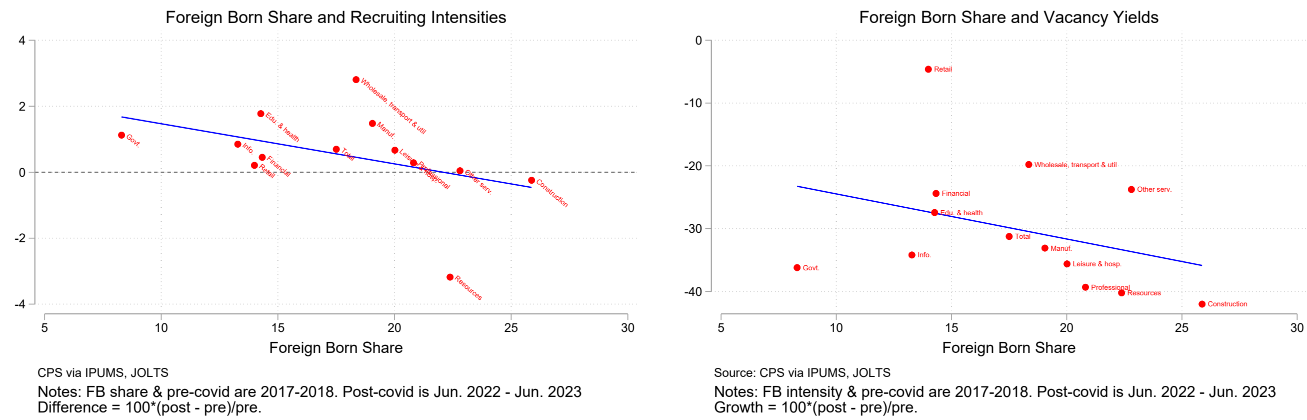
Second, and in the same spirit, we look at the relationship between the industry-level foreign-born employment share and the pre- to post-pandemic growth rate of the vacancy yield.[20] When this measure falls, it indicates that the labor market is tighter. As we illustrate in panel (b) of Figure 8, unsurprisingly the post-pandemic period (Jun 2022-June 2023) has seen considerably lower vacancy yields across all industries. Perhaps surprisingly, compared to the pre-pandemic period (2017-18), the most foreign born intensive industries have experienced larger percentage falls in their vacancy yields. The post-pandemic labor market tightness has grown to be more pronounced in the sectors that have historically been most reliant on foreign-born workers.

5.3.2 Participation

An alternative possibility is that CPS-based estimates are accurate, but labor market participation rates of the new immigrants are low. For example, recent immigrants may be disproportionately non-working age. CPS estimates contradict this possibility. Of the 4 million foreign-born increase since October of 2020 according to the CPS, 2.6 million are prime aged (25-64), and 3 million are older than 16 (see Figure 9).[21]

A second possibility is that, despite a large increase in the immigrant population, and a

[20] The vacancy yield is defined as the ratio of hires to vacancies in the previous month.
[21] We compute these as the net increases in each foreign-born age group between July 2023 and October 2020.



(a) Change in recruiting intensity

(b) Change in vacancy yields

Figure 8: Foreign-born employment share vs. before-to-after-the-pandemic changes in measures of industry-level labor market tightness. We compute intensities following Davis et al. (2012).

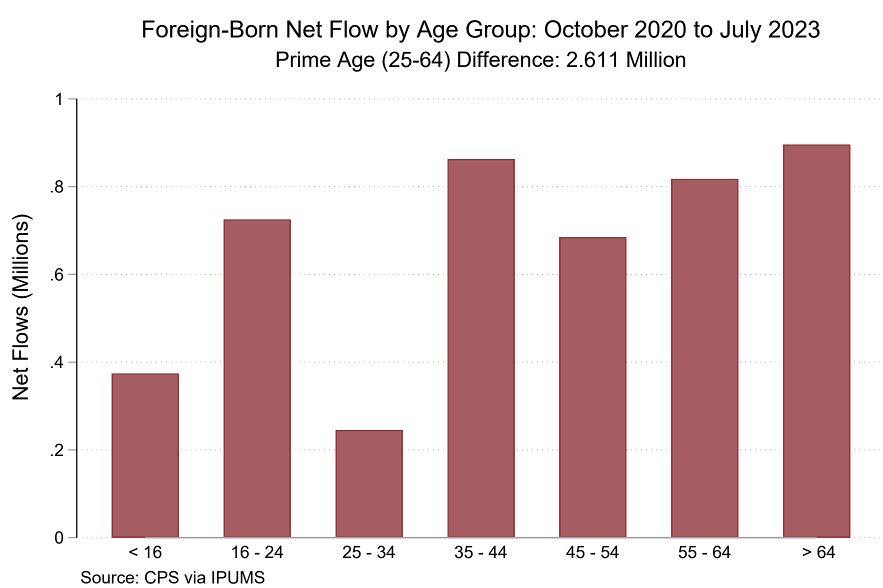


Figure 9: CPS estimated foreign-born population, by age cohorts.

(a) Overall participation **(b)** Recent immigrant participation

Figure 10: CPS estimated labor force participation rates.

demographic breakdown similar to that of the last decade, there has been a large fall in the post-pandemic labor force participation rate of the foreign born. Panel (a) of Figure 10 shows this not to be the case. Following the sharp fall in participation during 2020, the overall and foreign-born participation rates remained around 2 percentage points below pre-pandemic until mid- 2021. Since then, the participation rates have bounced back. While by September 2022 the overall participation rate had not gone back to pre-pandemic levels, the foreign-born participation rate had. Among the working-age population, the foreign-born participation rate (dashed blue) is currently above its pre-pandemic level.

We can dig deeper into the participation issue by looking at the labor force participation of newly arrived immigrants to the U.S. Panel (b) of Figure 10 plots the participation rate of the newly arrived immigrants relative to that of all the foreign born. Historically, recent immigrants have had lower participation rates than the foreign born as a whole (around 85 percent of the overall rate). Surprisingly, post-pandemic this is no longer the case; the participation rate for recent immigrants has been trending up, and in the last months is about the same as for more established immigrants. The employment to population ratio shows a similar pattern. Labor market tightness, thus, cannot be attributed to a low participation rate of the newly arrived immigrants.[22]

5.3.3 Cross-industry employment composition

The evidence of very tight immigrant-intensive industries and the lack of evidence for a fall in the participation rate of the foreign born are at odds with the remarkable growth in the foreign-born population reported by the CPS in the last two years. An alternative possibility, however, is that these new workers have not been seeking and obtaining jobs in the industries where the foreign born traditionally work.

[22] The CPS asks respondents whether they came to the U.S. in the last three years. We take the difference in responses between December and January of each year to identify the 'new immigrants' that year.

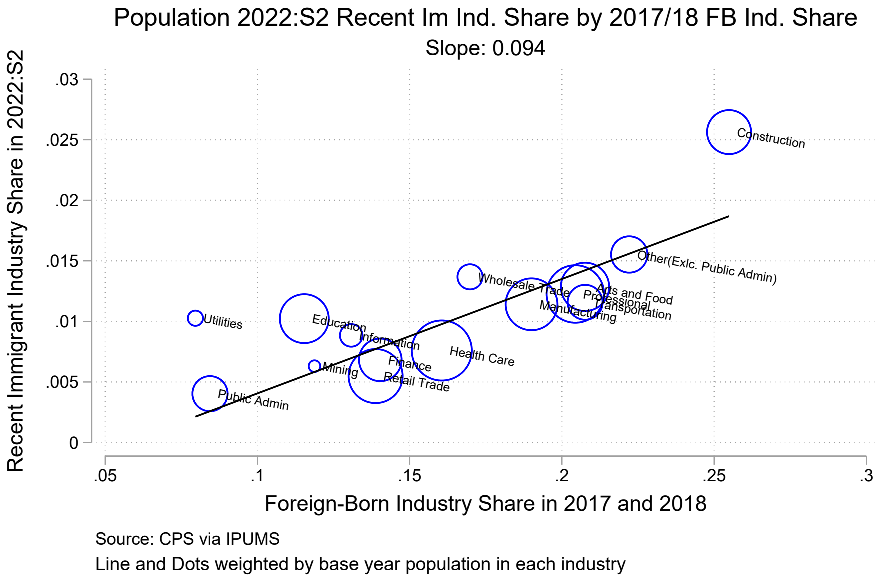


Figure 11: Recent immigrant employment across industries and traditional foreign-born intensity.

To explore this possibility, in Figure 11 we present a scatter plot of the recent immigrant share of employment in the second half of 2022, against the pre-pandemic (2017-18) foreign-born share of employment across our broad industry categories. The industries where recent immigrants are employed follow the earlier patterns of employment for the foreign born. This rules out that the increased tightness in the traditionally foreign-born intensive industries is the result of a recent change in the types of industries to which immigrants flow.

6 Discussion

Routine data collection was one of the many activities that faced extreme challenges during the pandemic. It is well documented that the in-person interviews for sample entrants were suspended for months, as it would not have been safe for interviewers or interviewees to conduct them (see IPUMS (2023)). In-person interviews for new survey entrants did not resume at the same time in all parts of the country. It seems plausible that differences in data collection methods could lead to differences in response rates, and that this, combined with differences in demographics by geography, could lead to unforeseen sample changes. Without a crystal ball, and with the important goal of getting the overall size of the population right, estimates of some sub-populations may be off. As a proper assessment of the state of the supply chain following the pandemic should include the role of foreign-born labor as a salient component of the labor supply (Powell (2022)), it will be important to compare immigration estimates from the most recent ACS and decennial Censuses to better understand how the labor market is evolving in this unprecedented time.

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A Appendix

A.1 Weight elasticities and benchmarking exercise

We define ω_{it} as the CPS weight of individual i in survey round t, $\overline{\omega}_t^j$ as the mean weight of group j in survey round t, and N_t^j as the sample size among group j in survey round t. We also define a time-t 'weight elasticity' as the growth rate of the mean weight for a group relative to the growth rate of the sample size for that group, between time t and a baseline time period (February 2020):

$$\varepsilon_t^j = \left| \frac{(\bar{\omega}_t^j/\bar{\omega}_0^j) - 1}{(N_t^j/N_0^j) - 1} \right|, \quad j = fb, ub.$$

We then define

$$\rho_t \equiv -\varepsilon_t^{ub} \left(\frac{N_t^{fb}}{N_0^{fb}} - 1 \right).$$

as the adjustment factor, to compute benchmarked foreign-born population estimates under the assumption that the foreign-born weights should have moved in the same proportion to changes in the sample size as the U.S. born weights did:

$$\hat{Pop}_t^{fb}|_{counter} = (1 + \rho_t)\bar{\omega}_0^{fb} N_t^{fb}.$$