Apportionment of the US House of Representatives in 2020 under Alternative Immigration-Based Scenarios

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Introduction

ON APRIL 1, 2020, the United States Census Bureau will conduct the country's 24th decennial census. The primary purpose of the decennial census is to provide population counts for the states that are then used in the apportioning of the House of Representatives. The requirement for a decennial census was written in 1787 into Article I, Section 2 of the US Constitution: "Representatives and direct taxes shall be apportioned among the several states which may be included within this Union according to their respective numbers … The actual enumeration shall be made within three years after the first meeting of the Congress of the United States, and within every subsequent term of ten years in such manner as they shall by law direct."

Although Article I, Section 2 requires that apportionment be based on the size of a state's population, the Constitution specifies neither the method for apportioning the House, nor the persons to be included in the apportionment population. The absence of constitutional guidelines has resulted in contentious debates over the years with respect to both the apportionment method and the definition of the apportionment population. Altering either the method or the definition has the potential of shifting seats from one state to another, thereby increasing or decreasing a state's political influence. In addition, the number of a state's seats in the House determines the size of its delegation to the Electoral College, further increasing the political import of the apportionment process. These high political stakes have produced legal challenges from states that could be "winners" under alternate approaches, including debates about the apportionment method, and whether to include in the apportionment population non-citizens, undocumented[1] immigrants, and certain groups of citizens living overseas (e.g., *United States Department of Commerce v. Montana* 1992; *Ridge v. Verity* 1989; *FAIR v. Klutznick* 1980).

In the 2020 apportionment, some of these same debates are likely to arise as states seek to increase their political clout through challenges to the 2020 Census count and the apportionment process. Most probable,

however, are potential changes to the inclusion of portions of the immigrant population in the apportionment count—particularly surrounding questions of citizenship and undocumented status. In March 2018, the Commerce Department announced that it would include a citizenship question on the census questionnaire for the first time in 70 years. This change was made in response to a request from the Department of Justice articulated in a memorandum in late 2017. Although framed as a method for the improved enforcement of the Voting Rights Act (Gary 2017), there is potential that the inclusion of this question in the 2020 Census will result in a greater undercount of the undocumented population. The current political climate has produced heightened fears of deportation among immigrants. For states with large immigrant populations, the inclusion of a citizenship question could therefore result in a smaller population count and, consequently, a possible loss in their number of seats in the House. Indeed, states are already marshalling resources to create "Complete Count" campaigns in an attempt to ensure that their residents are counted (Milligan 2018).

The debate over the inclusion of the citizenship question emphasizes that the apportionment process continues to be viewed as fluid, with the potential for modifications that could shape political power for states and for political parties. Although challenges in the past have included the method of apportionment (e.g., *United States Department of Commerce v. Montana* 1992), the Method of Equal Proportions has been used since 1940 and will surely be the method used in the 2020 apportionment (see Appendix for details on the Method of Equal Proportions).

The current definition of the apportionment population is the following: the population residing in each state on census day plus certain individuals living overseas who claim the state as their "state of residence," namely, military personnel and US government employees and their dependents. Most likely, this will be the apportionment population definition that will be used in 2020. However, the continued controversy over the definition—particularly with respect to non-citizens and undocumented immigrants—indicates that the potential for legal challenges and partisan debate will persist for the 2020 apportionment.

In this article, we ask how the 2020 apportionment of House seats among the 50 states would be altered if the definition of the apportionment population were to change in response to debates surrounding immigration and citizenship. We examine scenarios in which the apportionment population is differently defined, and we then apportion the House based on each of these scenarios and compare these results to the apportionment based on state population projections for the year 2020.

Overall, our results provide insight about potential political winners and losers under varying apportionment definitions, and they also reveal the ways that immigration has shaped political power among the states. We show that when the House of Representatives is apportioned based on

these alternative scenarios, there is a varying amount of redistribution of House seats among the states. Under most scenarios, including those most directly related to the addition of a citizenship question on the 2020 Census, the number of seat changes is quite small. For individual states that could be potential political winners, these small changes that remain are quite meaningful. We find, however, that the scenarios related to the citizenship question produce little or no change in the number of seats allocated to Republican or Democratic states. Thus, although a population undercount is a strong possible outcome of adding of a citizenship question to the Census, shifts in political power across parties are much less likely.

Immigration and the apportionment population

Our alternative scenarios adjusting the 2020 apportionment populations of the states deal with various aspects of citizenship and immigration. The fact that the distribution of political power among the states is due in part to the size of their immigrant populations has prompted some to argue that portions of the immigrant population, namely, non-citizens, the foreign-born, or the undocumented should be excluded from the apportionment population. Our scenarios adjust the size of the apportionment populations of the states by excluding, one at a time, each of these immigrant groups.

The congressional apportionment process is intended to ensure political representation in the House that is reflective of the variation in population size across states. Disputes regarding the appropriate composition of the apportionment population are typically grounded in disagreements about the best manner to achieve the goal of fair political representation. If the goal is to ensure an equal voice among voters, or *electoral* equality, then the apportionment population should be limited to citizens eligible to vote. This, however, results in many states having large portions of their population unrepresented, including children, legal non-citizen immigrants, undocumented immigrants, and disenfranchised felons (Cowan 2015; Tienda 2002). If the goal is *representational* equality, then each elected official should represent an equal number of people, regardless of whether those individuals are eligible to vote.

Tensions will likely arise between electoral and representational equality when large non-enfranchised populations reside unevenly across the country (Cowan 2015). In these cases, representational equality results in those citizens living in states with large non-enfranchised populations having more "voting power" than those living in states with smaller such populations. As noted by Cowan (2015), this situation has occurred over time, including when women were excluded from the franchise and were under-represented in western states.

Today, the unequal distribution of immigrants across the states produces a similar scenario wherein non-enfranchised populations are

concentrated in some states more so than in others. In 2013, over 13 percent of the total population of the US was born in foreign countries, compared to 10 percent in 2000 and less than 5 percent in 1970 (note that some of the foreign-born will likely be non-enfranchised). The foreign-born population in the US has grown from 9.6 million in 1970 to 31.1 million in 2000 to 41.3 million in 2013. It is projected to be as large as 78.2 million by 2065 (Lopez, Passel, and Rohal 2015).

Further, the undocumented immigrant population has grown from 3.5 million in 1990 to a peak of 12.2 million in 2007, more than a tripling in less than three decades. The most recent estimate places the number of un-documented immigrants in the US at 11.3 million in 2014 (Passel and Cohn 2015). Undocumented immigrants are not restricted only to persons who entered the US without documents and without authorization, mostly via the US border with Mexico. As many as 40 percent of the undocumented population now residing in the US are "visa overstayers." These are immigrants who entered the US with legal passports and legal visas but either stayed past their visa expiration dates or otherwise violated the terms of their admission into the US. Most flew into the US legally from Asia, Europe, and other continents and entered at major airports in San Francisco, New York, Los Angeles, Houston, and elsewhere (Poston and Morrison 2017).

In 2012, more than half of the foreign-born population lived in four states: California, Texas, New York, and Florida. Regarding the undocu-mented foreign-born population, in 2012 over 2.5 million, or more than one-fifth of them, lived in California. Texas was next with 1.7 million, and Florida was the third largest with 925 thousand (Poston and Bouvier 2017). Given this uneven distribution of immigrants and undocumented immi-grants across the United States, the principles of voter and representational equality are in tension. This imbalance has spurred challenges to the defi-nition of the apportionment population.

Arguments have been advanced to support the inclusion of all individ-uals residing in a state despite potential conflicts with the principle of voter equality. The Fourteenth Amendment stipulates that all "persons" be in-cluded in the apportionment count, but only citizens are permitted to vote. This distinction provides support for the idea that "the right to representa-tion is more fundamental than the right to exercise the franchise" (Tienda 2002, 592). The lower courts appear to concur (*Garza et al. v. County of Los Angeles* 1990; Goldfarb 1995, 1452), placing a priority on equal representa-tion in adjudicating matters concerning local apportionment (Baumle and Poston 2004; Baumgaertner 2018).

In addition, there are practical considerations for the inclusion of all persons in the apportionment population. Immigrants depend on many public services, such as schools, hospitals, libraries, police, fire protection, and garbage pickup. Excluding this segment of the population from the ap-portionment definition would result in less political power and resources for

communities with large immigrant populations, but continued dependence on public resources (Tienda 2002; Goldfarb 1995). Immigrants not only rely on public resources, they also make contributions through the payment of taxes, military service, and other services to their respective communities (Baumgaertner 2018; Goldfarb 1995; Tienda 2002). Accordingly, their inclusion in the apportionment population should be viewed as important both to ensure a state's access to needed resources, and in recognition of their contributions to the economy and community.

Legal challenges have particularly concentrated on the inclusion of undocumented immigrants in the apportionment population. In 1979, the Federation for American Immigration Reform (FAIR) sued to enjoin the Census Bureau from including undocumented immigrants in the apportionment population for 1980 (*FAIR v. Klutznick* 1980). The plaintiffs argued that the inclusion of undocumented immigrants was unconstitutional due to their concentration in a few states, resulting in an increase in the number of representatives for those select states (see also Woodrow-Lafield 2001). The plaintiffs also asserted an electoral equity argument, contending that the lawful residents in districts with large numbers of undocumented immigrants would possess greater political power than those in districts without undocumented immigrants. The court dismissed the case because the plaintiffs lacked standing as individuals who were personally harmed and thus able to sue, and the case was dismissed on appeal to the Supreme Court for want of jurisdiction (see also Poston et al. 1998, 2). In 1989, FAIR, 40 members of Congress, and the Commonwealth of Pennsylvania again sued regarding the inclusion of undocumented immigrants; this case was also dismissed for lack of standing (*Ridge v. Verity*; Poston, Bouvier, and Dan 1999; Baumle and Poston 2004). In 2011, Louisiana submitted a bid to the Supreme Court to file a complaint regarding the inclusion of undocumented immigrants in the apportionment population; the Court rejected Louisiana's request (*Louisiana v. Bryson* 2012).

Thus, although legal action has been taken to exclude undocumented immigrants from the apportionment population, the Court has yet to reach a verdict on the constitutionality of this kind of exclusion. As a result, the issue of whether to include immigrants, legal or undocumented, in the apportionment population remains contentious (Baumle and Poston 2004; Poston and Bouvier 2017).

Debates over the addition of the citizenship question to the 2020 decennial census have also produced several legal challenges—for example, in a federal lawsuit filed in July 2018 in New York, 20 states, 13 cities, and the United States Conference of Mayors sued the Department of Commerce (responsible for the Census). The court dismissed the claim based on the Enumeration Clause, but is allowing the case to proceed on two bases: that the addition of the citizenship question violated administrative procedures and is arbitrary and capricious, and that the question itself is

unconstitutional because it is motivated by discriminatory animus (*New York et al. v. US Department of Commerce* 2018). In addition to legal challenges, former Census Bureau Directors and the current Census Chief Scientist John Abowd have raised concerns regarding the lack of testing of the citizenship question and its potential for a dampening effect on census participation by undocumented immigrants (American Statistical Society 2018; Thompson 2018).

Assuming the citizenship question remains on the 2020 decennial census, experts are uncertain about how it will affect the degree of response to the census questionnaire by undocumented immigrants (American Statistical Society 2018; Badger 2018; Brown et al. 2018). Drawing on 2016 American Community Survey data, Badger (2018) projected that if 15 percent of non-citizens elected not to participate, then it would likely result in a loss of a seat for California and New York with Colorado and Montana gaining a seat; but this analysis did not account for the population changes that will occur among the states between 2016 and 2020. Although the exact effects are uncertain, it is likely that states and cities containing large immigrant populations—particularly, large undocumented immigrant populations—could lose political power as a result of the inclusion of the citizenship question.

At the Census Bureau, Brown et al. (2018) examined the potential costs and benefits of a citizenship question on the census by evaluating the quality of the data for self-reported citizenship questions. They compared responses to citizenship questions on various Census Bureau surveys and administrative records on citizenship from the Social Security Administration. They found that nonresponse rates to citizenship questions were highest for Hispanics, non-citizens, and nonrelatives, and that the nonresponse rate increased by 1.8 percentage points between 2013 and 2016. Relatedly, in a 2017 Census Bureau pretest, immigration status-related fears resulted in some participants providing inaccurate household information or attempting to terminate interviews (Meyers 2017). These findings indicate an increased sensitivity to citizenship questions for these groups.

Brown et al. (2018) also attempted to estimate the nonresponse rate for the census that could be attributed to the citizenship question by comparing response rates for the same households to the 2010 Census (which did not have a citizenship question) to the 2010 American Community Survey (which did have a citizenship question). They found that the response rate of citizens was lower for the ACS by about 14 percentage points, but was lower for non-citizens by about 19 percentage points. This finding supports the hypothesis that the presence of a citizenship question could result in less participation in the census by non-citizens. Coupled with the finding that nonresponse has increased for non-citizens and Hispanics in recent years, nonresponse rates could be higher in the 2020 Census if it includes a citizenship question.

Further, the inclusion of the question could lay the groundwork for yet another legal challenge to exclude all non-citizens from the apportionment definition. Indeed, many have argued that this is the true impetus for including the question (Badger 2018). Accordingly, the addition of the citizenship question in 2020 has the potential to shape the apportionment definition in multiple ways.

The 2020 apportionment: Baseline scenario

Before examining how our various immigration-based scenarios could shape apportionment, we first project the 2020 apportionment populations of each of the 50 states, applying the current definition of the apportionment population. Namely, the apportionment population of a state is defined as the resident population plus the "overseas population" from that state, that is, those US government employees and members of the military and their dependents serving overseas, who claim the state as their "state of record."

We produced the 2020 apportionment populations by first developing projections for 2020 of the resident populations of the 50 states. We took the estimated resident populations of the states for 2017 as produced by the US Census Bureau and subtracted from these 2017 estimates the 2010 census counts of their resident populations. We annualized these 2010–2017 differences, multiplied them by three, and then added them to the 2017 population estimates, to yield 2020 projected counts of the resident populations of the states. Our assumptions are (1) that the Census Bureau's estimates of the states' 2017 populations are their true counts, and (2) that the states will grow or decline in size between 2017 and 2020 at the same annual rates as their changes between 2010 and 2017.

To determine the projected counts of the 2020 overseas populations of the states, we took the 10-year changes in their 2010–2020 resident populations and applied these percent changes to the size of their 2010 overseas populations. Our assumption here is that the overseas populations of the states will change in size between 2010 and 2020 at the same rates we have projected for their resident populations. We then added our 2020 projections of the resident populations of the states to our 2020 projections of their overseas populations. These are the projected population counts reported for the states in the first data column of Table 1.

We then used these projected 2020 apportionment population numbers to apportion the House in 2020, using the Method of Equal Proportions (see Appendix). In column 2, we report the actual results of the 2010 apportionment, and in column 3 the results of our 2020 apportionment.

If our projections are correct, there will be in 2020 (actually in January of 2021) a net change of nine seats in the US House. By comparison,

TABLE 1 Projected population for 2020, number of seats in the US House of Representatives for 2010 and projected for 2020, and six scenarios of change in House seat assignments for 2020

States	2020 Projected population Col-1	Seats 2010 Col-2	Projected seats 2020 Col-3	Change 2020, no foreign-born Col-4	Change 2020, No non-Citizens Col-5	Change 2020, No undocumented Col-6	Change 2020, 50% undocumented excluded Col-7	Change 2020, 25% undocumented excluded Col-8	Change 2020, No undocumented Mexicans Col-9
Alabama	4,938,894	7	6	+1	+1	+1	+1	0	+1
Alaska	763,950	1	1	0	0	0	0	0	0
Arizona	7,305,254	9	10	−1	−1	−1	−1	−1	−1
Arkansas	3,052,475	4	4	0	0	0	0	0	0
California	40,598,245	53	53	−9	−3	−1	−1	0	−2
Colorado	5,872,068	7	8	0	0	0	0	0	0
Connecticut	3,601,265	5	5	0	0	0	0	0	0
Delaware	992,418	1	1	0	0	0	0	0	0
Florida	22,023,216	27	29	−3	−2	−1	0	0	0
Georgia	10,788,441	14	14	+1	0	0	0	0	0
Hawaii	1,462,676	2	2	0	0	0	0	0	0
Idaho	1,787,408	2	2	+1	0	0	0	0	0
Illinois	12,821,048	18	17	0	0	0	0	0	0
Indiana	6,763,195	9	9	+1	0	0	0	0	0
Iowa	3,195,837	4	4	+1	0	0	0	0	0
Kansas	2,949,415	4	4	0	0	0	0	0	0
Kentucky	4,514,712	6	6	+1	0	0	0	0	0
Louisiana	4,770,169	6	6	+1	+1	0	0	0	0
Maine	1,343,845	2	2	0	0	0	0	0	0
Maryland	6,187,868	8	8	0	0	0	0	0	0
Massachusetts	7,005,165	9	9	0	0	0	0	0	0
Michigan	10,023,199	14	13	+1	+1	0	0	0	0

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TABLE 1 (continued)

States	2020 Projected population	Seats 2010	Projected seats 2020	Change 2020, no foreign-born	Change 2020, No non-Citizens	Change 2020, No undocumented	Change 2020, 50% undocumented excluded	Change 2020, 25% undocumented excluded	Change 2020, No undocumented Mexicans
	Col-1	Col-2	Col-3	Col-4	Col-5	Col-6	Col-7	Col-8	Col-9
Minnesota	5,704,757	8	7	+1	+1	+1	+1	0	+1
Mississippi	3,002,222	4	4	0	0	0	0	0	0
Missouri	6,189,459	8	8	+1	0	0	0	0	0
Montana	1,082,057	1	1	+1	+1	+1	+1	+1	+1
Nebraska	1,965,781	3	3	0	0	0	0	0	0
Nevada	3,134,990	4	4	0	0	0	0	0	0
New Hampshire	1,359,041	2	2	0	0	0	0	0	0
New Jersey	9,111,785	12	12	−1	0	0	0	0	0
New Mexico	2,108,213	3	3	0	0	0	0	0	0
New York	20,091,829	27	26	−3	0	0	0	0	0
North Carolina	10,621,642	13	14	+1	0	0	0	0	0
North Dakota	794,659	1	1	0	0	0	0	0	0
Ohio	11,742,765	16	15	+2	+1	+1	0	0	+1
Oklahoma	4,021,531	5	5	+1	0	0	0	0	0
Oregon	4,294,562	5	6	0	0	0	0	0	0
Pennsylvania	12,881,664	18	17	+1	+1	0	0	0	0
Rhode Island	1,065,186	2	1	0	0	0	0	0	0
South Carolina	5,217,828	7	7	0	0	0	0	0	0
South Dakota	899,509	1	1	0	0	0	0	0	0
Tennessee	6,905,001	9	9	+1	0	0	0	0	0
Texas	29,787,435	36	39	−2	−2	−1	−1	0	−1
Utah	3,254,346	4	4	+1	0	0	0	0	0

TABLE 1 (continued)

States	2020 Projected population	Seats 2010	Projected seats 2020	Change 2020, no foreign-born	Change 2020, No non-Citizens	Change 2020, No undocumented	Change 2020, 50% undocumented excluded	Change 2020, 25% undocumented excluded	Change 2020, No undocumented Mexicans
	Col-1	Col-2	Col-3	Col-4	Col-5	Col-6	Col-7	Col-8	Col-9
Vermont	627,292	1	1	0	0	0	0	0	0
Virginia	8,708,019	11	11	0	0	0	0	0	0
Washington	7,728,048	10	10	0	0	0	0	0	0
West Virginia	1,806,501	3	2	+1	+1	0	0	0	0
Wisconsin	5,853,186	8	8	0	0	0	0	0	0
Wyoming	590,802	1	1	0	0	0	0	0	0
TOTAL	333,310,873	435	435	0	0	0	0	0	0

Election Data Services (2017) developed in late December 2017 state-level population projections for 2020 and then used them to apportion the House for 2020. Their 2020 apportionment results are almost the same as our results. The only difference is that they had Montana "maybe" gaining one seat, and California "maybe" losing one seat. If one removes their "maybe" assignments, their shifts and distribution of seats in 2020 are identical with ours.

Between the 1980 and 1990 apportionments, there was a change among the states of 19 seats; eight states gained seats and 13 states lost seats. Between the 1990 and 2000 apportionments, there was a change of 12 seats; eight states gained seats and 10 states lost seats (Mills 2001). Between the 2000 and 2010 apportionments, there was also a change of 12 seats. Our projections for 2020, as just noted, indicate that between the 2010 and 2020 apportionments, there will be a change of nine seats. So, in the last four apportionments, there has been a downward trend in the number of changing House seats. This likely reflects a greater stability in the residential distributions of the state populations.

Comparing the House seat assignments for 2020 with those for 2010 (compare columns 2 and 3, Table 1) our projections show that Texas will gain three seats in 2020, Florida will gain two seats, and Arizona, Colorado, North Carolina, and Oregon will each gain one seat. Nine states will each lose one seat in the 2020 apportionment, namely, Alabama, Illinois, Michigan, Minnesota, New York, Ohio, Pennsylvania, Rhode Island, and West Virginia. The state with the largest number of House seats in 2010 was California with 53 seats; our projections indicate that California will neither gain nor lose seats in 2020. California has had 53 seats since the 2000 apportionment.

We first examine the possible political implications of the 2020 apportionment based on our projected 2020 results. We compare the distributions of House seats in 2000 and in 2010 with the distribution of seats projected for 2020, according to whether the states are Democratic or Republican. We designate the states as Democratic or Republican in 2000 on the basis of the majority vote of the state in the 2000 Bush-Gore election, in 2010 on the basis of the 2008 Obama-McCain election, and in 2020 on the basis of the 2016 Trump-Clinton election.

We show in the first three columns of Table 2 the distribution of House seats for 2000, 2010, and 2020, according to whether the states are Republican or Democratic. After the 2000 apportionment of the House, the distribution was just about even, with Republican states claiming 218 seats and Democratic states claiming 217 seats. After the 2010 apportionment, the Democratic states claimed 298 seats and the Republican states 137 seats. According to our 2020 projections, the 2020 apportionment will result in the Republican states claiming 247 seats and the Democratic states claiming 188 seats. The primary reason for the notable change between the 2010 and

TABLE 2 Apportionment of the US House of Representatives in 2000, 2010, and projected 2020, and various 2020 apportionment scenarios, by political party and region

	APPORTIONMENTS			2020 APPORTIONMENT SCENARIOS					
	Actual 2000	Actual 2010	Projected 2020	Change 2020 No foreign-born	Change 2020 No non-citizens	Change 2020 No undocs	Change 2020 50% undocs excluded	Change 2020 25% undocs excluded	Change 2020 No undoc Mexicans
	(col-1)	(col-2)	(col-3)	(col-4)	(col-5)	(col-6)	(col-7)	(col-8)	(col-9)
Republican	218	137	247	+12	+2	0	0	+1	+1
Democratic	217	298	188	−12	−2	0	0	−1	−1
Southern	154	161	165	+3	−1	−1	0	0	0
Non-southern	281	274	270	−3	+1	+1	0	0	0

projected 2020 apportionments is our reliance on the results of the 2008 and 2016 elections, the former being a Democratic victory and the latter being a Republican victory, to classify a state as Democratic or Republican.

We also show in Table 2 the distribution of House seats for 2000, 2010, and 2020, according to whether the states are located in the South (the census-defined South consists of the 16 states of Alabama, Arkansas, Delaware, Georgia, Florida, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia). Owing to long-standing political differences in the US between Southerners and non-Southerners (Clarke 1981), the political impacts of apportionment may also be gauged by grouping the states according to whether they are in the census-defined South or non-South. The apportionment in 2000 resulted in the assignment of 154 seats in the South and 281 seats in the non-South. The 2010 apportionment had the South receiving 161 seats, with 274 seats going to the non-South. And our projections for 2020 indicate that the 2020 apportionment will result in the South receiving 165 seats—four more than in 2010—with 270 being assigned to non-Southern states. Between 2000 and 2020, the Southern states will have gained 11 seats, increasing their number from 154 in 2000 to 165 in 2020.

The 2020 apportionment: Alternative citizenship and immigration modification scenarios

We now present alternative scenarios for 2020 state seat assignments based on different citizenship and immigration modifications to the projected 2020 apportionment populations of the states. As we move through the scenarios, we will show the number of seats and, therefore, electoral votes, lost or gained by each state as a result of how the apportionment population is defined. We will also show for each scenario how many seats will end up in Republican states and in Democratic states (as defined on the basis of the majority vote of the state in the 2016 Trump-Clinton election) and how many seats will end up in Southern states and in non-Southern states.

The first, and most drastic, scenario removes all foreign-born persons from the apportionment population. This scenario is not presented because, most likely, many of these individuals are now citizens. Rather, it is presented because it provides insight into how immigration has affected and continues to affect the composition of the US House of Representatives, a matter with serious public policy implications and one which deeply informs the current partisan political debate.

The second scenario excludes all non-citizens from the population. This is also a drastic scenario, but one that is likely to continue to be raised

in legal challenges—particularly if the citizenship question is included on the 2020 decennial census.

The third scenario excludes all undocumented immigrants, reflecting a challenge that has been often made to the apportionment definition. We then present two variations on this scenario in an attempt to capture the potential effects of the citizenship question on the apportionment. Namely, we exclude 50 percent and then 25 percent of the undocumented population to determine how a lack of participation in the census by this group could shape the 2020 apportionment. Although the citizenship question could have a chilling effect on all non-citizens, legal or otherwise, the undocumented population is likely to be the group most affected by the addition of this question.

Finally, we present another variation of the undocumented scenario by excluding only undocumented immigrants from Mexico. This is not a likely scenario given the constitutional challenges that would certainly arise, but we include it to provide insight into the effect of undocumented immigration from Mexico—the country of origin most often targeted in debates over undocumented immigration—on apportionment.

Scenario 1: Exclusion of all foreign-born

In the first scenario, we excluded from the 2020 apportionment populations all persons residing in the US who were born outside the US. Once again, given that some of these individuals will be citizens, this scenario does not present the effects of a likely legal challenge to the apportionment population. But as noted, we include this scenario to convey the overall effects of immigration on the apportionment of seats.

To estimate the number of foreign-born persons residing in each state in 2020, we first took the proportion of the resident population of each state in 2016 comprised of foreign-born persons; we multiplied this proportion by the state's projected 2020 resident population and subtracted the resulting product from the 2020 resident population. We then added in the state's "overseas" population. Our assumption is that the proportions of the states' populations that are foreign-born in 2016 will be the same proportions in 2020. We then used these adjusted 2020 state population numbers to apportion the House. The fourth data column of Table 1 shows the number of House seats assigned to the states based on this scenario.

As has been shown previously for the 2000 apportionment by both Tienda (2002) and Baumle and Poston (2004), omitting all foreign-born from the apportionment populations would result in a drastic and sizable seat change in the 2020 apportionment. There would be a change of 19 seats. California would be the biggest loser, sacrificing nine of its 53 seats.[2] In addition to California's loss of nine seats, this first scenario indicates that

Florida and New York would each lose three seats, Texas would lose two, and New Jersey would lose one.

Ohio would gain two additional seats if all foreign-born were excluded from the 2020 apportionment population, and 17 states would each gain one seat, namely, Alabama, Georgia, Idaho, Indiana, Iowa, Kentucky, Louisiana, Michigan, Minnesota, Missouri, Montana, North Carolina, Oklahoma, Pennsylvania, Tennessee, Utah, and West Virginia.

These shifts provide insight into the politics of the current partisan American immigration debate. We show in the fourth column of Table 2 that if all foreign-born were excluded from the 2020 apportionment population, there would be an increase of 12 seats in Republican states from 247 to 259, with accompanying impact on votes in the Electoral College. The Democratic states would significantly lose seats in the House, as well as electoral votes, if foreign-born persons were excluded from the apportionment population.[3] Although the foreign-born are unlikely to ever be excluded from the apportionment population, states losing seats and, thus, electoral votes due to the foreign-born, could well push for limitations on immigration in the years ahead to reduce the impact of the foreign-born population on future apportionments.

Scenario 2: Exclusion of the non-citizen population

In this scenario, we excluded from the 2020 projected apportionment population all foreign-born persons who were not naturalized citizens. This scenario thus conveyed the effects of a scenario in which an equal voice among voters is ensured. We ascertained the proportion of the resident population of each state in 2016 comprised of citizens; we then multiplied this proportion by the projected 2020 resident population of the state and subtracted this product from the 2020 resident population. We then added into the "citizen-only" resident 2020 population the state's "overseas" population. We used these adjusted 2020 state population numbers to apportion the House via the Method of Equal Proportions. The fifth data column of Table 1 shows the change in the number of House seats assigned to the 50 states according to this scenario. We compare this distribution of House seats with the 2020 apportionment (in column 3) we expect to occur based on our 2020 population projections.

Including only citizens in the apportionment populations (along with the overseas population) would result in a net change of eight seats. California would lose three seats, Texas and Florida would each lose two seats, and Arizona would lose one. The eight states of Alabama, Louisiana, Michigan, Minnesota, Montana, Ohio, Pennsylvania and West Virginia would each gain one seat. We show in the fifth column of Table 2 that Republican states would gain two seats over the number we expect them to be allotted in 2020, and the Southern states would lose one seat.

Scenario 3: Exclusion of all or portions of the undocumented immigrant population

In this third scenario, we excluded all undocumented immigrants from the apportionment population. In such a scenario, states with large undocumented immigrant populations would lose seats. The first task was to estimate the number of undocumented immigrants residing in the states in 2020. To do this, we obtained data from the Pew Research Center on the estimated numbers of undocumented immigrants residing in the 50 states in 2014 (Pew Research Center 2014). We then multiplied the proportions of undocumented immigrants in each state in 2014 by the state's projected 2020 resident population and subtracted the resulting numbers from their 2020 resident populations. We then added in the state's "overseas" population. We are assuming that the proportions of undocumented immigrants in the states in 2014 will be the same proportions in 2020. The sixth data column of Table 1 shows the number of House seats assigned to the states based on this scenario.

Our estimates indicate that excluding undocumented immigrants from the apportionment population results in a net change of four seats: Arizona, California, Florida, and Texas would each lose one seat; Alabama, Minnesota, Montana, and Ohio would each gain one seat. Excluding undocumented immigrants from the 2020 apportionment populations would result in no change in the number of seats assigned to Republican and Democratic states that we have projected to occur in 2020 (Table 2, column 6). Southern states would lose one seat under this scenario. These modest results—minimal or even no effect after state-by-state results are aggregated—suggest that the political debate over the effect of not including undocumented immigrants in the apportionment populations of the states is overheated.

Igitur, so too is the debate over the citizenship question. To capture the potential effects of the citizenship question on apportionment, we have produced two additional scenarios to reflect the change in seats that would result if portions of the undocumented population chose not to participate in the 2020 decennial census. Given that we do not know how many undocumented immigrants would be deterred from participation if a citizenship question is included in the 2020 census, we have assessed potential changes if 50 percent or if 25 percent of the undocumented population chose not to participate.

Our results indicate that if 50 percent of the undocumented immigrant population does not respond, there would be a net change of three seats compared to our projected 2020 apportionment, with Arizona, California, and Texas each losing a seat and Alabama, Minnesota, and Montana each gaining one. If 25 percent of the undocumented population does not respond, there would be a net change of one seat, with Arizona losing a

seat to Montana (see columns 7 and 8 of Table 1). Although three seats change in the 50 percent scenario, there is no change in the distribution of seats to Republican and Democratic states because two Republican seats and one Democratic seat are exchanged for two Republican seats and one Democratic seat located in different states. If 25 percent did not respond, there is only one seat change, but Republican states would gain one seat and lose another, resulting in no net change. There would be no change in the distribution of House seats to Southern and non-Southern states if either 50 percent or 25 percent of undocumented immigrants did not respond to the 2020 decennial census (see columns 7 and 8 of Table 2).

We present a final scenario to address a misconception. Public opinion polls indicate that most Americans believe that virtually all the undocumented immigration to the US is from Mexico. And more Americans are likely to say that the impact of Latin American immigrants on US society, especially of immigrants from Mexico, is far more negative than positive (Lopez, Passel, and Rohal 2015). Also, they believe that virtually all the undocumented immigrants from Mexico are persons who entered the US without documents; very few are visa overstayers. Since so many Americans believe the immigration problems of the US could be solved if the US were to keep undocumented Mexicans out of the US, we developed a scenario in which the House would be apportioned in 2020 with the apportionment populations excluding undocumented Mexican immigrants.

We used the same data and method in identifying the numbers of undocumented Mexican immigrants residing in the 50 states as in the scenario in which we excluded all undocumented immigrants from the 2020 apportionment populations. The ninth data column of Table 1 shows the number of House seats assigned to the states based on a scenario that excludes undocumented immigrants from Mexico.

Our calculations indicate that if the 2020 apportionment populations excluded undocumented immigrants from Mexico, there would be a net change of four seats. Arizona and Texas would each lose one seat, and California would lose two seats; Alabama, Minnesota, Montana, and Ohio would each gain one seat. Excluding undocumented immigrants from Mexico from the 2020 apportionment populations would result in no change in the number of seats assigned to Republican and Democratic states, and no change in the number of seats assigned to Southern and non-Southern states, compared to those we have projected to occur in 2020 (Table 2, column 9).

Conclusion

Our immigration-based scenarios provide insights into the ways that immigration, past and present, has shaped the apportionment of seats in the US House of Representatives. On the more extreme end, scenario 1 excludes

all foreign-born individuals from states' apportionment populations, resulting in a shift of 19 seats. Given that this scenario does not take citizenship into consideration, it serves primarily to convey the ways in which immigration patterns and policies have contributed toward the distribution of seats within the House. States that trend Democratic have been clear beneficiaries, which goes a long way towards explaining the current partisan immigration debate.

Scenario 2 reveals the implications of a focus on representational equality, rather than electoral equality. If only citizens are included in the apportionment population, there would be a resulting change of eight seats; Republican states would gain seats under this scenario. Although there is a legal argument to be made regarding a focus on citizens to achieve electoral equality, this argument has been rejected in prior legal challenges in favor of representational equality. Nonetheless, the inclusion of a citizenship question on the census could lay groundwork for new legal challenges seeking to limit the apportionment population definition only to citizens.

Even absent a ruling to exclude all non-citizens, the presence of the citizenship question on the 2020 decennial census could change the 2020 apportionment by deterring participation in the census by undocumented immigrants. We examined a scenario that reflects the upper bound of this effect, in the unlikely event that all undocumented immigrants decline to participate, while our additional scenarios examined the potential effects if smaller proportions of the undocumented population chose not to participate. In the scenario where all undocumented were excluded, there was a change in four seats, and a change in three seats if 50 percent chose not to participate. If 25 percent of the undocumented are deterred from participation, only one seat changed in the apportionment.

States with the potential to gain from the deterrent effects of a citizenship question have adequate incentive to support such a question; those with the potential to lose have adequate incentive to challenge it in court. In all of our immigration-based scenarios, California was the state most affected. This is not surprising given the large size of the state's immigrant population and the large size of the total population of the state. However, the impact under the varying scenarios could also well incite action by any of those less populous states affected by the exclusion of portions of the immigrant population. Alabama, Minnesota, Montana, and Ohio all gained seats under these immigration-based scenarios. These states, or others, could take legal action to exclude some portion of the immigrant population from the apportionment base to gain a seat or to reduce the political influence of California (Baumle and Poston 2004).

But although individual states might gain or lose political power as a result of the citizenship question, the most notable and timely conclusion of this analysis is that there would likely be no change in the number of seats allocated to states classified, according to our approach, as Republican

or Democratic based on the 2016 election results. In the scenario simply excluding undocumented immigrants, there was no change in party apportionment. And, in both the scenarios of a 50 percent and a 25 percent reduction resulting from the citizenship question, the overall number of seats for each party did not shift despite some seat reallocation. Thus, although the addition of this question has been framed as a partisan battle for political power, it is unlikely to have much, if any, effect on the overall seat count for either political party.

Notes

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1 For economy, when we say "undocumented" we include unauthorized immigrants as well as those who have entered the country legally and overstayed.

2 More than nine seats in California are actually attributable to the state's immigrant population because children born in the United States to immigrants are by definition not foreign-born and hence would not be excluded from the apportionment population in this scenario. Their presence in California, though, owes to the presence of their foreign-born parents (Baumle and Poston 2004).

3 North-South changes would be less significant: if all foreign-born were excluded from the 2020 apportionment population, the number of Southern seats would increase from 165 to 168.

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Appendix: The Method of Equal Proportions

The major objective in apportioning the US House of Representatives is to assign equitably the 435 seats to the 50 states (the District of Columbia is not included in the apportionment and thus does not receive representation

in the House). There are several constraints: (1) the total number of House seats must equal 435; (2) partial seats cannot be assigned to states, nor can representatives be given fractional votes; (3) representatives may not be shared by two or more states; and (4) every state must be assigned at least one seat in the House (Baumle and Poston 2004).

The first 50 seats are automatically assigned, one per state. The Method of Equal Proportions is then used to assign the remaining 385 seats. This method identifies which states should receive second seats, which states should receive third seats, and so forth. Although, as noted, the Constitution does not dictate how the apportionment should be carried out, the underlying assumption is "one man, one vote." That is, no one person should have more of a voice than another person. Representatives should be assigned to states in proportion to their populations. But as Balinski and Young (1982, p. 1) have argued, the notion of proportionality is not enough by itself to "solve the problem of apportionment" because it does not address what is to be done with fractions (also see Anderson [1988, pp. 150–151]).

The Method of Equal Proportions is the method used by the Congress to solve the problem of remainders. It was proposed in 1911 by Joseph A. Hill, a US Census Bureau statistician, and supported by Professor Edward V. Huntington of Harvard University (Huntington 1920). It was first used in 1940, has been used ever since, and will undoubtedly be used again in 2020.

Equal Proportions is a divisor method that first develops a target ratio of population to representatives that is based on data for the nation (excluding the District of Columbia). In 2020, we project that the apportionment population of the US will be 333,310,873 (see the last figure in the first data column of Table 1). Hence the target ratio in 2020 is projected to be 766,002.01 (or 333,310,873 divided by 435). This ratio, also called a divisor, is then divided into the apportionment populations of each of the states to obtain quotients. The first few data items in the first column of Table 1 indicate that the 2020 apportionment populations for Alabama and for California are projected to be 4,938,894 and 40,598,245, respectively. Their projected 2020 quotients will thus likely be 6.4476 (or 4,938,894 divided by 766,002.01), and 53.0002 (or 40,598,245 divided by 766,002.01), respectively. "The quotients are rounded up or down to a neighboring whole number according to a rule" that is specific to the apportionment method (Balinski and Young 1982, p. 61).

The Method of Equal Proportions endeavors to ensure that "the difference between the representation of any two states is the smallest possible when measured both by the relative difference in the average population per district, and also by the relative difference in the individual share in a representative" (Schmeckebier 1941, p. 22). The method gives to a state another representative "when its [apportionment] population, divided by the geometric mean of its present assignment of representatives and of its next

higher assignment, is greater than the [apportionment] population of any other state divided by the geometric mean of the assignment to such other state and its next higher assignment" (Schmeckebier 1941, p. 22).

The first step in using the Method of Equal Proportions is to multiply the apportionment population of each state by the following fraction: $\frac{1}{\sqrt{N(N-1)}}$ where N equals the particular seat being claimed, i.e., the second seat or the third seat or the fourth seat, and so on. Multiplying this proportion by the states' apportionment populations provides numbers known as priority values. For instance, the proportion used in determining a state's claim to a second seat is:

$$\frac{1}{\sqrt{2\,(2-1)}} = \frac{1}{\sqrt{2}} = \frac{1}{1.41421356} = 0.70710678$$

The proportion used in determining a state's claim to a third seat is:

$$\frac{1}{\sqrt{3\,(3-1)}} = \frac{1}{\sqrt{6}} = \frac{1}{2.44948974} = 0.40824829$$

The rounding rule for this method is to round a state's quotient either up or down, "depending on whether or not the quotient exceeds the 'geometric mean' of these two choices" (Balinski and Young 1982, p. 62). The geometric mean of two numbers is the square root of their product. Thus, according to the Method of Equal Proportions, if a state had a quotient of 1.39, it would receive one representative because the geometric mean of 1 and 2 is 1.41; however, if a state had a quotient of 1.42, it would receive two representatives (Baumle and Poston 2004).

In the actual apportionment calculations, however, the above rule per se need not be invoked because one instead relies entirely on the proportions developed for the various seats. Thus, once the proportions are developed for determining the priorities for the various seats (we have shown above the proportions for seats 2 and 3), they are multiplied by the apportionment populations of each of the 50 states. That is, the proportion used for determining the states' priorities for a second seat (0.70710678) is successively multiplied by the apportionment populations of each of the 50 states; and then this procedure is repeated using the proportion to determine the states' priorities for a third seat (0.40824829), and so forth. After all of these multiplications have been completed, the resulting priority values are then ranked in order, the largest first, and the smallest last. The 385 House seats are assigned to the states with the 385 highest priority values (Baumle and Poston 2004).