

# EXHIBIT B



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## **EXHIBITS**

**Exhibit 1** Curriculum Vitae of Stuart D. Gurrea

**Exhibit 2** Documents and Data Reviewed and Considered

## I. ASSIGNMENT

1. My name is Stuart D. Gurrea. I have been asked by counsel for Defendants to perform a critical assessment of certain quantitative analyses in support of the legal actions brought forward by the State of California, the City of San Jose, and the Black Alliance for Just Immigration (collectively “Plaintiffs”) against Wilbur L. Ross, Jr., U.S. Department of Commerce, Ron Jarmin, and U.S. Census Bureau (collectively, “Defendants”).<sup>1</sup> Plaintiffs’ complaints arise from the reinstatement of a question about citizenship in the 2020 Census questionnaire.
2. Dr. Matthew A. Barreto, Dr. Bernard L. Fraga and Dr. Andrew Reamer among others submitted expert reports in support of Plaintiffs’ action.<sup>2</sup> Dr. Fraga’s assignment was to assess “the impact of the addition of a citizenship question on the 2020 Census population for California, and California’s congressional apportionment [...]”.<sup>3</sup> Dr. Fraga’s analyses rely in part on the results of Dr. Barreto’s survey regarding census participation. Dr. Reamer analyzes “the impact of the inclusion of a question on citizenship status on the 2020 Census questionnaire on the distribution of particular federal domestic assistance funds to certain states, counties and communities.”<sup>4</sup> Dr. Reamer’s analyses rely on population estimates developed by Dr. Fraga.
3. In this report, I assess the reliability of the impact evaluations Dr. Fraga and Dr. Reamer conduct to isolate the effect of the reinstatement of a citizenship question on 2020 Census population estimates, congressional seat apportionment, and distribution of federal funds. Part of my analyses involve assessing Dr. Fraga’s use

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<sup>1</sup> First Amended Complaint for Declaratory and Injunctive Relief, *State of California, County of Los Angeles, City of Los Angeles, City of Fremont, City of Long Beach, City of Oakland, and City of Stockton v. Wilbur L. Ross, Jr., U.S. Department of Commerce, Ron Jarmin and U.S. Census Bureau*, May 4, 2018; and, Complaint for Declaratory and Injunctive Relief, *City of San Jose and Black Alliance for Just Immigration v. Wilbur L. Ross, Jr., U.S. Department of Commerce, Ron Jarmin and U.S. Census Bureau*, April 17, 2018.

<sup>2</sup> Rule 26(A)(2)(B) Expert Report and Declaration of Matthew Barreto, PhD, September 7, 2018 (hereafter Barreto Report”); Rule 26(A)(2)(B) Expert Report and Declaration of Bernard L. Fraga, PhD, September 19, 2018 (hereafter “Fraga Report”); and, Rule 26(A)(2)(B) Expert Report and Declaration of Andrew Reamer, PhD, September 18, 2018 (hereafter “Reamer Report”).

<sup>3</sup> Fraga Report, pp. 2 and 3.

<sup>4</sup> Reamer Report, p. 1.

of the survey data Dr. Barreto developed to measure the impact of the inclusion of a citizenship question.

4. Defendants also asked me to reassess Dr. Fraga's and Dr. Reamer's predictions under an alternative assumption regarding the success rate of the Census Bureau in Non-Response Follow-Up operations ("NRFU").
5. I am being compensated at a rate of \$575 per hour for my work in this matter; I will be compensated at the same rate if I am asked to testify at deposition or trial. My compensation does not depend in any way on the outcome of this matter or my opinions expressed herein.

## II. QUALIFICATIONS

3. I am a Vice President at Economists Incorporated ("EI"), an economics consultancy founded in 1981 that provides applied economic analysis to clients. I have attached as Exhibit 1 to this report my *curriculum vitae*, which lists my academic background, publications, and prior professional experience.
4. I graduated from the University of Seville, Spain, with a Bachelor's degree in Economics; I received a Master's degree in economics from Northwestern University; and, I received my Ph.D. in economics from Northwestern University. My fields of specialization include econometrics – the application of mathematical and statistical models to the analysis of economic data. A significant part of my training as an economist consists of the development and application of quantitative methods to analyze data and measure the impact of an intervention on a population of interest.
5. I joined EI in September 2001 and I have been affiliated with EI ever since. My initial title at EI was Senior Economist, and I have held my current title of Vice President since 2010. In each of these positions, I have applied my experience and expertise in economics and data analysis to address a variety of issues, including the assessment of public policy and private business decisions. I have conducted

analyses across a broad range of industries for businesses, individuals, non-profit organizations, government agencies, and industry associations.

6. During the course of my professional career, I have performed critical assessments of quantitative analyses and specifically impact evaluations at the request of policy makers, business managers, investors, corporate officers, or in the context of litigation. My assessments have involved the application of principles of statistics, econometrics, financial mathematics, and microeconomics, and the use of a variety of quantitative methods, including surveys, regression analysis, forecasting and projections, and simulations. More generally, most of my work as an economist is built on data analysis, including survey data.
7. In the context of litigation, I have conducted economic analyses in an advisory role for both plaintiffs and defendants and I have provided expert trial testimony rooted in the application of quantitative methods. This work typically has entailed a critical review and analysis of data sources and methods, actual analysis, and the development of conclusions based on these analyses.

### **III. SUMMARY OF OPINIONS**

8. Dr. Fraga's estimates of the percentage of population not counted due to reinstatement of a citizenship question in the 2020 Census are overstated because of his unreliable interpretation of survey data. Two of Dr. Fraga's projection scenarios rely on survey responses to determine the reduction in Census self-response rates attributable to the reinstatement of a citizenship question. Dr. Fraga overstates these rates by assuming that unwillingness to reply to certain survey questions implies a reduction in population counts. Also, Dr. Fraga overstates these estimated declines by categorizing survey respondents without any basis.
9. Dr. Fraga defines a total of four scenarios as a basis to estimate the percentage of the projected U.S. population not counted due to reinstatement of a citizenship question in the 2020 Census. These four scenarios understate the effectiveness of the Census in mitigating a decline in self-response rates and result in overstated reductions in

- population counts attributable to the inclusion of a citizenship question. Two scenarios assume that NRFU is entirely ineffective in mitigating undercounts from a citizenship question. A third scenario assumes much of the NRFU effort would be entirely nonexistent or ineffective, and a fourth scenario assumes a NRFU success rate that has no basis. All four scenarios assume the U.S. Census Bureau will not impute information to mitigate net undercount.
10. Dr. Fraga's and Dr. Reamer's evaluations of the impact of the reinstatement of a citizenship question on congressional apportionment and federal funds distribution, respectively, are overstated. Their evaluations are driven by overstated population undercount estimates as quantified in Dr. Fraga's four scenarios.
  11. With a NRFU success rate in 2020 equal to the 2010 Census NRFU success rate (and assuming no additional undercount mitigation through imputation), congressional apportionment in any state (including California) does not change due to reinstatement of a citizenship question. At this same NRFU success rate (and no additional undercount mitigation through imputation), the distribution of federal funds to the State of California is estimated to decline by 0.01 percent before mitigation due to the reinstatement of a citizenship question for each of the three federal programs Dr. Reamer evaluated.
  12. In expressing the opinions contained in this report, I make the following reservations:
    - a. The opinions described below are based on my review of available documents, including Plaintiffs' experts' reports, and various analyses I have performed. I reserve the right to express additional opinions, supplement or amend the opinions in this report, or provide additional reasons for these opinions as additional documents are produced, the transcripts of expert and fact depositions become available, and new facts are introduced during discovery and trial.
    - b. In Exhibit 2, I list the documents and data I relied upon to prepare my expert report. In addition to these documents, I may use other exhibits as a summary or to support my opinions. I also may consider additional exhibits and work



product introduced in connection with the testimony of other experts or witnesses, such as Dr. Fraga's and Dr. Reamer's workpapers, which I did not receive in a timely fashion, or other documents produced in this case, and I reserve the right to revise or amend my opinions accordingly.

#### **IV. DR. REAMER'S AND DR. FRAGA'S IMPACT EVALUATIONS**

13. Dr. Fraga's and Dr. Reamer's assignments are to quantify the impact of the reinstatement of a citizenship question to the 2020 Census questionnaire on population counts, the apportionment of congressional seats, and on the distribution of domestic assistance funds associated with certain federal programs.<sup>5</sup>
  
14. Dr. Fraga's and Dr. Reamer's evaluations of the impact of reinstatement of a citizenship question on congressional seat apportionment and on the distribution of federal funds rely on two key inputs: Dr. Fraga's estimates of the population by state at the time of the 2020 Census enumeration;<sup>6</sup> and estimates of the undercount in the 2020 Census due to the reinstatement of a citizenship question. Dr. Fraga estimates four undercount scenarios. Scenario A is based on estimates of the estimated percent of Census non-response attributable to the reinstatement of a citizenship question in a national survey conducted by Dr. Barreto.<sup>7</sup> Scenario B is the same as Scenario A, but removes from the undercount the share of individuals "who changed their mind and decided to reply to the Census" after a follow-up question.<sup>8</sup> The follow-up question is considered a "proxy for individuals who would be responsive to reasonable follow-up efforts conducted by the Census and thus would be enumerated."<sup>9</sup> Scenario C is based on an estimated 5.8 percent point difference in modeled rates of initial non-response for non-citizen households versus citizen

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<sup>5</sup> Fraga Report, p. 3. Reamer Report, p. 2.

<sup>6</sup> Fraga Report, § 6 and Reamer Report, § 4.

<sup>7</sup> Fraga Report, § 5.1.1.

<sup>8</sup> Fraga Report, § 5.1.2.

<sup>9</sup> Fraga Report, § 5.1.2.

households reported in a Census analysis.<sup>10</sup> Scenario D is the same as Scenario C but reduces the 5.8 percent self-response decline estimate by 86.63 percent. According to Dr. Fraga, he was provided with this percentage, which is purported to be an estimate of the NRFU enumeration success rate based on Census data and analyses.<sup>11</sup> Dr. Reamer relies on Dr. Fraga's scenarios C and D.<sup>12</sup> Table 1 below summarizes these scenarios.

**Table 1**  
**Plaintiffs' Experts' Scenarios**

	Decline in Self-response Rates	NRFU Success Rate
Scenario A	Barreto "drop-off" estimates by ethnicity and nativity	0%
Scenario B	Barreto "drop-off" estimates by ethnicity and nativity	Barreto estimates by ethnicity and nativity
Scenario C	5.8 % for non-citizen households	0%
Scenario D	5.8 % for non-citizen households	86.63%

15. For each of these scenarios, Dr. Fraga calculates the proportion of each demographic group that is subject to his predicted decline in population counts.<sup>13</sup> He uses the results to estimate the population of each state that is not counted due to the reinstatement of a citizenship question.<sup>14</sup>
16. Dr. Fraga also estimates the change in apportionment due to the reinstatement of a citizenship question by comparing apportionment under his baseline 2020 projections to his four alternatives, Scenarios A-D.<sup>15</sup> Dr. Fraga purports to implement the "Method of Equal Proportions" methodology to compute apportionment.<sup>16</sup> He further calculates the probability of losing one or more congressional seats by allowing for variation in the estimated inputs to his apportionment calculations.<sup>17</sup> From his analyses, Dr. Fraga concludes that "the

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<sup>10</sup> Fraga Report, § 5.2.1.

<sup>11</sup> Fraga Report, § 5.2.2.

<sup>12</sup> Reamer Report, § 4.A.

<sup>13</sup> Fraga Report, § 5.3.

<sup>14</sup> Fraga Report, § 5.4.

<sup>15</sup> Fraga Report, § 6.2.

<sup>16</sup> Fraga Report, § 6.1.

<sup>17</sup> Fraga Report, § 6.3.

- addition of a citizenship question to the 2020 Census would lead to a disproportionate reduction in California's population relative to other states.”<sup>18</sup>
17. Dr. Reamer's assignment is to analyze the “impact of a question on citizenship status on the 2020 Census questionnaire on the distribution of particular federal domestic assistance funds to certain states, counties, and communities.”<sup>19</sup> According to Dr. Reamer, as of November 2017, there were 2,249 domestic assistance programs offered by U.S. federal departments and agencies.<sup>20</sup> Out of these, Dr. Reamer identifies 320 federal domestic assistance programs as “census-guided programs”—programs that employ census-derived data to distribute funds.<sup>21</sup> Within these 320 programs, Dr. Reamer notes that “programs with geographic allocation formulas” exhibit the greatest sensitivity of funds distribution to census mismeasurement.<sup>22</sup>
  18. Dr. Reamer does not estimate the impact of the reinstatement of a citizenship question on the geographic distribution of federal domestic assistance across all census-guided domestic assistance programs. Rather, he illustrates the “nature of the fiscal impacts” by assessing the impact on three specific programs among those that are more sensitive to census mismeasurement (programs that use census-derived data in their geographic allocation formulas): Title I Grants to Local Educational Agencies (“LEAs”); Supplemental Nutrition for Women, Infants, and Children (“WIC”); and, Social Services Block Grants (“SSBG”).<sup>23</sup>
  19. To evaluate the impact of the reinstatement of a citizenship question, Dr. Reamer takes Dr. Fraga's undercount estimates purportedly associated with the reinstatement of a citizenship question and estimates the impact of those undercounts on the distribution of funds for certain federal assistance programs. In particular, he relies on Dr. Fraga's Scenarios C and D estimates of the percentage of residents in each

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<sup>18</sup> Fraga Report, § 7.

<sup>19</sup> Reamer Report, p. 2.

<sup>20</sup> Reamer Report, p. 6.

<sup>21</sup> Reamer Report, p.9.

<sup>22</sup> Reamer Report, p. 14. Emphasis in original removed.

<sup>23</sup> Reamer Report, p. 23.

state that would not be counted due to the reinstatement of a citizenship question on the 2020 Census questionnaire as a basis for quantifying the distributional impact of funds from the three federal programs listed above.<sup>24</sup> Dr. Reamer estimates that the impact of an undercount on the distribution of funds to the state of California would range between 0.1 and 0.9 percent of its actual Title I Grants to LEAs, between 0.1 and 0.8 percent of its actual WIC grant, and between 0.1 and 0.9 percent of its actual SSBG grant.<sup>25</sup>

## **V. CAUSAL ATTRIBUTION IS NECESSARY TO CONDUCT A RELIABLE IMPACT EVALUATION**

20. Plaintiffs' experts' analyses involve three impact evaluations associated with the reinstatement of a citizenship question in the 2020 Census. First, Dr. Fraga evaluates the impact on state population counts, including California.<sup>26</sup> Second, Dr. Fraga evaluates the impact on congressional seat apportionment based on population projections reflecting a citizenship question.<sup>27</sup> And third, Dr. Reamer evaluates the impact on the distribution of federal assistance funds, also based on population projections reflecting a citizenship question.<sup>28</sup>

21. Impact evaluation is defined as:

An assessment of how the intervention being evaluated affects outcomes, whether these effects are intended or unintended. The proper analysis of impact requires a counterfactual of what those outcomes would have been in the absence of the intervention.<sup>29</sup>

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<sup>24</sup> Reamer Report, p. 23.

<sup>25</sup> Reamer Report, pp. 26-28. Dr. Reamer's analyses assume all other factors driving the allocation of funds to states such as the size of the federal program or the distribution criteria remain constant. Also, his analyses do not evaluate how changes in state allocations affect individual beneficiaries, whose eligibility is dependent on state level decisions. For example, Dr. Reamer notes that "[s]tate agencies have the option to limit WIC eligibility to U.S. citizens." (Reamer Report, p. 19.)

<sup>26</sup> Fraga Report, Table 3, p. 18.

<sup>27</sup> Fraga Report, Table 4, p. 23.

<sup>28</sup> Reamer Report, pp. 26-29.

<sup>29</sup> "Outline of Principles of Impact Evaluation," OECD, <http://www.oecd.org/dac/evaluation/dcdndep/37671602.pdf>.

22. For example, Dr. Fraga reports in Table 3 of the Fraga Report his estimates of the impact of the reinstatement of a citizenship question on population counts.<sup>30</sup> In this analysis, the intervention is the reinstatement of a citizenship question. The counterfactual is represented by a 2020 baseline scenario defined as projected 2020 Census counts *without* a citizenship question.
23. To isolate the impact of an intervention it is necessary to separate the impact of the intervention from other confounding factors. For example, if the outcomes in the counterfactual differ from the baseline for reasons other than the intervention, then the total impact cannot be attributed to the intervention. Therefore, causal attribution (establishing the causal link between the intervention and the impact) is necessary to produce reliable findings through impact evaluation.
24. Table 3 of the Fraga Report provides estimates of the impact of the reinstatement of a citizenship question under four alternative scenarios. If the differences between the baseline estimates *without* a citizenship question and the estimated counts *with* a citizenship question cannot be attributed solely to the reinstatement of a citizenship question, then these differences do not quantify the impact of the reinstatement of a citizenship question.

**VI. DR. FRAGA'S INTERPRETATION OF SURVEY DATA OVERSTATES THE EXPECTED DECLINE IN CENSUS SELF-RESPONSE RATES DUE TO A CITIZENSHIP QUESTION**

25. Dr. Fraga's Scenarios A and B rely on survey response data to determine the reduction in Census self-response rates attributable to the reinstatement of a citizenship question.<sup>31</sup> Dr. Fraga overstates these declines in self-response rates by interpreting survey data as if item-nonresponse necessarily reduces population

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<sup>30</sup> Fraga Report, Table 3, p. 18.

<sup>31</sup> Survey respondents could indicate that they either will or will not respond to the Census, or they could refuse to answer the survey question ("nonresponse"). Dr. Fraga defines the self-response rate as the number of survey respondents who indicate that they will respond to the Census as a proportion of all surveyed individuals, including those who did not respond to the question.

counts. Also, Dr. Fraga overstates these declines in self-response rates by categorizing survey respondents without any basis.

26. As a preliminary matter, Dr. Fraga uses these survey data without assessing the level and sources of nonresponses and the extent to which they may have affected the survey results. The Federal Judicial Center, National Research Council, Reference Manual on Scientific Evidence states with respect to the use of surveys: “It is incumbent on the expert presenting the survey results to analyze the level of and sources of nonresponse, and to assess how the nonresponse is likely to have affected the results.”<sup>32</sup> This is important because survey results may reflect nonresponse bias, whereby responses only come from a portion of the selected sample with certain characteristics. This bias would render the sample unrepresentative of the population as a whole, rendering the sample unreliable for drawing inferences about the population. For example, if individuals with low incomes systematically do not respond to the survey, then the survey will not be representative of the population as a whole.
27. Dr. Fraga compares projected self-response rates with and without the reinstatement of a citizenship question. To this end, Dr. Fraga’s Scenarios A and B rely on two of Dr. Barreto’s survey questions that purportedly provide self-response data. One is a counterfactual question about participation *without* a citizenship question (“Q1”):

The Census is an official population count that is conducted every 10 years by the federal government. It requires all households to list the name, age, and race or ethnicity of every person living in the home and provide that information to the Census Bureau either online, by mail, or in-person with a census taker. The Census is required to keep this information confidential, and every single household in the country is required to participate.

In March 2020 you will receive an invitation from the U.S. Census to fill out the census form. Do you plan to participate and submit your household information?<sup>33</sup>

The other is a question about participation *with* a citizenship question (“Q2”):

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<sup>32</sup> “Reference Manual on Scientific Evidence,” Federal Judicial Center and National Research Council, Third Edition, p. 383.

<sup>33</sup> Barreto Report, p. 75.

In 2020, the federal government is adding a new question to require you to list whether you, and every person in your household is a U.S. citizen, or not a citizen. With the addition of a citizenship question, will you participate and submit your household information, or not?<sup>34</sup>

The response options to these questions in the survey are “Yes, will participate” or “No, will NOT participate.”<sup>35</sup>

**A. Dr. Fraga Overstates the Expected Decline in Self-Response Rates by Assuming Item-Nonresponse Always Reduces Counts**

28. Dr. Fraga uses Dr. Barreto’s survey results to estimate the Census self-response rates and associated population counts due to the reinstatement of a citizenship question. However, Dr. Barreto’s survey questions do not generate the information necessary to address this question and Dr. Fraga’s interpretation of the data overstates the reduction in self-responses.
29. There are two types of self-response that generate valid counts. One is a self-response that answers all questions and the other is a self-response with “item nonresponse,” in which some but not all questions were answered.<sup>36</sup> For example, with the reinstatement of a citizenship question in the 2020 Census, a self-response that answers every question except a citizenship question will generate a valid count. As Dr. John Abowd – Chief Scientist and Associated Director for Research and Methodology at the United States Census Bureau – explains, “[i]tem nonresponse does not impact the accuracy of the count.”<sup>37</sup>
30. Dr. Fraga, however, treats the response “No” to Q2 and the lack of a response (“Missing”) to the same question as equivalent. Generally, without statistical support item non-response cannot be associated uniquely with one of the allowable responses. Excluding everyone who did not respond to Q2 from the count increases Fraga’s undercount estimates. This assumption results in an overstated estimated

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<sup>34</sup> Barreto Report, p. 75.

<sup>35</sup> Barreto Report, p. 75.

<sup>36</sup> Expert Disclosure of John M. Abowd, September 21, 2018 (“Abowd Disclosure”), p. 9.

<sup>37</sup> Abowd Disclosure, p. 9.

reduction in population counts with the reinstatement of a citizenship question because of an overstated decline in self-response rates in Dr. Barreto's survey.

31. Dr. Barreto defines "drop-off" rate as the percentage of survey respondents who can be described as follows:

[a]ny individual who said "yes" to question 1 participation [Q1], but then changed their answer and no longer said "yes" at question 2 [Q2] when describing the 2020 census with a citizenship question is counted as a non-respondent.<sup>38</sup>

Consistent with this definition, Dr. Fraga measures the effect of the reinstatement of a citizenship question on self-response rates by this drop-off rate and generates population estimates in Scenarios A and B.<sup>39</sup>

32. Respondents to Dr. Barreto's survey who say "yes" to Q1 but not to Q2, however, may still provide enough information to generate a valid population count. "No, will NOT participate" responses to Q2 may include respondents that will continue to participate but only fail to submit the citizenship information. As described above, these are item non-responses that still generate valid Census counts. Q2 asks "[w]ith the addition of a citizenship question, will you participate *and* submit your household information, or not?" (Emphasis added.) Household information in Q2 includes a *required* listing of the citizenship status for every person in the household. A respondent that decides to continue to participate but not submit required citizenship information may respond "No, will NOT participate," as that response meets the first condition (will participate) but not the second (submit household information, including the required citizenship question). Such responses do not result in a reduction in self-response rates. As noted above, item non-response (in this case, non-response to a citizenship question) does not imply a reduction in population count. By assuming responses with item non-response always reduce the population count, Dr. Fraga fails to isolate the impact of the reinstatement of a citizenship question on population counts and overestimates the reduction therein.

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<sup>38</sup> Barreto Report, p. 34.

<sup>39</sup> Fraga Report, p. 12. As explained above, Scenario B includes a further adjustment.



**B. Dr. Fraga Overstates the Expected Decline in Self-Response Rates by Categorizing Respondents with No Basis**

33. The response options to Q2 of Dr. Barreto’s survey are “Yes, will participate” or “No, will NOT participate.”<sup>40</sup> Dr. Fraga purports to measure the “specific nonresponse attributable to the addition of a citizenship question” as the “estimates for the percent of respondents (and accompanying uncertainty) who replied ‘No, will NOT participate’ *or refused to respond* to the second question after initially stating ‘Yes, will participate’ to the first question.”<sup>41</sup> (Emphasis added.)
34. Dr. Fraga’s definition of drop-off fails to isolate the effect of the reinstatement of a citizenship question. A number of survey participants that answered “Yes, will participate” to Q1 did not respond to Q2. Dr. Barreto’s survey does not provide any information about these respondents’ willingness to participate in a Census with a citizenship question. Dr. Fraga, nevertheless, assumes that these respondents will not participate in a Census with a citizenship question. There is no basis for this assumption. The “Yes on Q1, no response on Q2” respondents account for 39 percent of the responses counted as drop-off observations. By assuming that none of these respondents – those who refused to answer Q2 – would respond to the Census at all, Dr. Fraga overstates the decline in self-response rates that are his basis for his Scenarios A and B.

**VII. DR. FRAGA’S SCENARIOS OVERSTATE UNDERCOUNTS**

35. The reliability of Plaintiffs’ experts’ analyses is largely determined by the reliability of Dr. Fraga’s Scenario A-D estimates of the undercount in the 2020 Census due to the reinstatement of a citizenship question. Plaintiffs’ undercount scenarios, however, assume limited mitigation of the expected decline in self-response rates from the reinstatement of a citizenship question. To the extent that mitigation of the decline in self-response rates is expected to be greater than that estimated by Dr. Fraga, the resulting projected undercounts in these scenarios will be smaller.

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<sup>40</sup> Barreto Report, p. 75.

<sup>41</sup> Fraga Report, pp. 11 and 12.

**A. The Measurement of Changes in Net Undercounts from the Reinstatement of a Citizenship Question**

36. The net undercount is defined as the difference between the official Census population count and the estimated number of people living in the United States at that time.<sup>42</sup>

$$\text{Net undercount} = \text{Census count} - \text{Population estimate} \quad (\text{Equation 1}).$$

37. Based on this definition, it is possible to estimate the net undercount attributable to the reinstatement of a citizenship question. Designating a Census count that includes a citizenship question with an asterisk (\*), and given the counterfactual Census count without a citizenship question, the change in population undercount as a result of the reinstatement of a citizenship question is:

$$\text{Net undercount}^* - \text{Net undercount} = \text{Census count}^* - \text{Census count} \quad (\text{Equation 2}).$$

Therefore, the projected change in net undercount resulting from the reinstatement of a citizenship question in the 2020 Census is:

$$\text{Projected 2020 Census count}^* - \text{Projected 2020 Census count} \quad (\text{Equation 3}).<sup>43</sup>$$

38. The projected 2020 count (*Projected 2020 Census count*) without a citizenship question can be estimated using historical data. The remaining term to estimate is the projected 2020 count with a citizenship question (*Projected 2020 Census count*\*), which depends on the sensitivity of the Census count to the reinstatement of a citizenship question.
39. Population counts are the combined result of self-responses *and* additional counts via NRFU and whole-person imputation.<sup>44</sup> As Dr. Abowd explains, “in the small percent of housing units for which we are unable to obtain an enumeration, we [the

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<sup>42</sup> <https://www.census.gov/dmd/www/techdoc1.html>.

<sup>43</sup> Consistent with this definition, Dr. Fraga describes undercounts as the “*net* population effect of households not responding to the Census as a result of the citizenship question.” Fraga Report, p. 10.

<sup>44</sup> Efforts to achieve enumeration include in-person interviews, use of administrative records, and interviews with proxy respondents (neighbors or building manager). Abowd Disclosure, pp. 6-13.

U.S. Census Bureau] *impute* the information for these housing units.”<sup>45</sup> (Emphasis added, citations omitted.) In equation form:

$$\text{Census count} = \text{Self-response counts} + \text{NRFU counts} + \text{Imputed counts}$$

(Equation 4).

40. By construction, NRFU and imputation mitigate self-response rates below 100 percent with the goal of ensuring complete enumeration. I refer to these efforts collectively as “mitigation.”<sup>46</sup>
41. To project how many individuals would be enumerated by the 2020 Census with a citizenship question, it is necessary to project “*self-response counts*,” “*NRFU counts*,” and “*imputed counts*.” The U.S. Census “projected that approximately 40 percent of the housing units in the 50 states, the District of Columbia, and Puerto Rico will not initially self-respond to the 2020 Census.”<sup>47</sup>

**B. Dr. Fraga’s Estimates of Changes in Net Undercounts Assume No or Limited Mitigation**

42. Dr. Fraga purports to estimate (using four alternative scenarios) the percentage of population not counted due to a citizenship question in the 2020 Census—the projected 2020 net undercount change defined in Equation 3 above. These estimates assume the Census will be ineffective or not very effective at mitigating an expected decline in self-response rates.
43. For simplicity I assume in this section that all terms refer to 2020 projections, and express Dr. Fraga’s calculation as:

$$2020 \text{ net undercount change} = 2020 \text{ Census count}^* - 2020 \text{ Census count}$$

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<sup>45</sup> See Abowd Disclosure, p. 6.

<sup>46</sup> “The primary purpose of NRFU is to determine the housing unit status of a nonresponding address and to enumerate the households at nonresponding housing units.” U.S. Census Bureau, [https://census.gov/programs-surveys/decennial-census/2020-census/planning-management/memo-series/2020-memo-2018\\_10.html](https://census.gov/programs-surveys/decennial-census/2020-census/planning-management/memo-series/2020-memo-2018_10.html).

<sup>47</sup> “2020 Census Detailed Operation Plan for: 18. Nonresponse Followup Operation (NRFU),” United States Census Bureau, April 18, 2018, p. 2.

44. Dr. Fraga quantifies projected Census counts *without* a citizenship question (2020 Census count) as “state-level 2020 population projections of how many individuals would be enumerated by the 2020 Census if it contains the same content as the 2010 Census.”<sup>48</sup> These estimates are based on data from updates to the decennial census counts.<sup>49</sup>
45. Dr. Fraga quantifies projected Census counts *with* a citizenship question in four alternative scenarios described in Table 1 above with varying degrees of mitigation. If the mitigation of the decline in self-response rates is expected to be greater than the levels assumed in Dr. Fraga’s scenarios, then undercounts in Scenarios A-D are attributable, at least in part, to Dr. Fraga’s assumptions and not the reinstatement of a citizenship question.
46. Scenarios A and C assume that the difference between Census 2020 population counts with and without a citizenship question is equal to the decline in self-response rates. In these scenarios, Dr. Fraga assumes that the Census will not mitigate the self-response decline.<sup>50</sup> That is, NRFU and imputation are assumed to have no effect on reducing the self-response decline. Therefore:

$$\begin{aligned} 2020 \text{ net undercount change} &= 2020 \text{ Census count}^* - 2020 \text{ Census count} \\ &= \text{Self-response counts}^* - \text{Self-response counts} \end{aligned}$$

47. If mitigation is expected to reduce the self-response decline associated with a citizenship question, then these scenarios do not provide a reasonable basis to project Census 2020 population counts. The survey evidence Dr. Fraga relies on, which is the basis for his Scenario B, indicates that NRFU is expected to be successful in reducing the self-response decline even with a citizenship question.<sup>51</sup>

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<sup>48</sup> Fraga Report, p. 8.

<sup>49</sup> Fraga Report, pp. 4 and 5.

<sup>50</sup> These scenarios assume that mitigation does not reduce unit non-response associated with the citizenship question.

<sup>51</sup> Fraga Report, pp. 12 and 13. Dr. Barreto’s survey data indicate that a larger proportion of respondents change from no participation with a citizenship question to participation with a citizenship question after follow-up than respondents that change from no participation without a citizenship question to participation without a citizenship question after follow-up.

This expectation is consistent with the effectiveness of the NRFU operation in the 2010 Census.<sup>52</sup> This evidence indicates that estimates under Scenarios A and C are undercounted for reasons other than the reinstatement of a citizenship question. In particular, these undercounts can be explained by unrealistically low mitigation rates and not the reinstatement of a citizenship question.

48. Dr. Fraga's Scenario B attempts to approximate the mitigating effect of non-response follow-up efforts by the Census by accounting for the results of a follow-up survey question. The follow-up question includes assurances about confidentiality and is asked allowing "some time to pass" since the initial question.<sup>53</sup> Dr. Fraga does not opine on the reliability or extent to which Dr. Barreto's follow-up questions capture the full extent of the Census NRFU operation.<sup>54</sup> Dr. Barreto notes that the inclusion of follow-up questions "mimics an attempt at re-contact in the real world in a condensed telephone interview setting."<sup>55</sup> Dr. Abowd's description of the actual NRFU operation, however, indicates that Dr. Barreto's survey question falls well short of measuring its expected effectiveness. Dr. Abowd explains that "there are numerous housing unit addresses that require the Census Bureau to send an enumerator to conduct an interview in person [...]."<sup>56</sup> Dr. Abowd further explains that if no response can be obtained from a household member after multiple attempts, an enumerator will attempt to gather the necessary information from another person such as a neighbor or property manager.<sup>57</sup> This indicates that Dr. Fraga's survey-based estimate of the NRFU success rate is likely understated and that

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<sup>52</sup> Memorandum from John Abowd and David Brown, September 28, 2018.

<sup>53</sup> Barreto Report, ¶ 92.

<sup>54</sup> See Abowd Disclosure, pp. 9-16. Dr. Barreto's survey yields inconsistent responses. For example, 15.7 percent of respondents that were willing to participate without a citizenship question but not with a citizenship question, do not confirm their interest in participating without a citizenship question after follow-up with additional confidentiality assurances. See Barreto Report, ¶ 90. Also, among those that would participate without a citizenship question, a larger proportion would not participate with a citizenship question if confidentiality assurances are offered in a follow-up question relative to the proportion that would not participate with a citizenship question that did not offer confidentiality assurances. See Barreto Report, ¶¶ 80 and 82.

<sup>55</sup> Barreto Report, ¶ 92.

<sup>56</sup> Abowd Disclosure, p. 9.

<sup>57</sup> See Abowd Disclosure, pp. 9-13.

his Scenario B undercount is likely overstated for this reason rather than the reinstatement of a citizenship question.

49. In Scenario D, Dr. Fraga assumes a NRFU success rate of 86.63 percent.<sup>58</sup> Dr. Fraga does not offer any basis at all for this assumption or how it relates to the expected success rate of the 2020 Census NRFU operation.
50. Moreover, all of Dr. Fraga's four scenarios project that there will be no mitigation using statistical methods such as imputation or administrative records enumerations. If imputation is expected to reduce undercounts, then all four scenarios are undercounted for reasons other than the reinstatement of a citizenship question.

#### **VIII. DR. FRAGA'S AND DR. REAMER'S EVALUATED IMPACTS ARE OVERSTATED**

51. Dr. Fraga uses his Scenarios A-D undercount estimates to estimate the impact of reinstatement of a citizenship question on congressional apportionment. Dr. Reamer uses Dr. Fraga's Scenarios C and D undercount estimates to estimate the impact of reinstatement of a citizenship question on the distribution of funds from three federal domestic assistance programs. Dr. Fraga's population undercounts in Scenarios A and B are overstated to the extent he overstates the decline in self-response rates derived from survey data. Similarly, Dr. Fraga's Scenarios A-D understate mitigation and therefore overstate net undercounts. As a result, Dr. Fraga's and Dr. Reamer's reliance on overstated estimates of undercounts attributable to a citizenship question result in overstated impacts.
52. "The Census Bureau is prepared to conduct the 2020 Census NRFU operation and believes that those efforts will result in a complete enumeration."<sup>59</sup> This implies that Census expects that it will fully mitigate any decline in self-response rates attributable to a citizenship question through NRFU and imputation. Plaintiffs' experts' scenarios, however, do not fully account for these expectations.

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<sup>58</sup> Fraga Report, § 5.2.

<sup>59</sup> Abowd Disclosure, p. 5.

53. By definition, a full enumeration with the reinstatement of a citizenship question will result in no undercount relative to the 2020 baseline population projections assuming no citizenship question. Therefore, if full enumeration is achieved, the reinstatement of a citizenship question will have no impact on congressional seat apportionment or distribution of federal assistance programs.
54. To demonstrate how Dr. Fraga's assumed low NRFU follow-up success rate contributes to Plaintiffs' experts' results, Defendants asked me to recalculate Plaintiffs' predictions assuming NRFU would have the same success rate as it had in the 2010 Census: 98.58 percent ("Historical NRFU-Rate Scenario").<sup>60</sup> As described above, this hypothetical scenario does not fully account for mitigation because it does not include imputation.
55. The results described below show that with a NRFU success rate equal to that of the 2010 Census, even before accounting for imputation, the reinstatement of a citizenship question will have no impact on congressional seat apportionment and a 0.01 percent effect on the distribution of federal funds through the programs Dr. Reamer evaluated.

#### **A. Impact Evaluation of Congressional Apportionment**

56. Dr. Fraga purports to quantify the impact of the reinstatement of a citizenship question on the 2020 Census on congressional apportionment. The formula for computing congressional apportionment is based on a priority ranking using each state's population counts.<sup>61</sup> As Dr. Fraga explains, the apportionment population includes "resident population as enumerated by the decennial census."<sup>62</sup> To the extent that Dr. Fraga's population estimates understate resident population, his congressional seat apportionment analysis is likely to be incorrect. As in Dr. Fraga's Scenario D, in the "Historical NRFU-Rate Scenario," the reinstatement of a citizenship question has no impact on congressional apportionment.

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<sup>60</sup> Memorandum from John Abowd and David Brown, September 28, 2018.

<sup>61</sup> <https://www.census.gov/population/apportionment/about/computing.html>.

<sup>62</sup> Fraga Report, ¶ 20.

# 1. The apportionment of congressional seats

57. Apportionment to the U.S. House of Representatives is mandated by the Constitution, which provides that each state receive at least one congressional seat. Since 1941 (based on the 1940 Census) the remaining seats have been divided among the states according to the Method of Equal Proportions. Seats are assigned based on “priority values,” calculated as each state’s population divided by a multiplier equal to the geometric mean of the state’s current and next seats.<sup>63</sup> Once priority values are calculated, they are ranked and the 51st through 435th seats are assigned based on ranking. The sum of seats for each state, including the one assigned per state, is the total seats in the House of Representatives apportioned to that state.
58. Dr. Fraga purports to have developed an apportionment formula that calculates multipliers, state priority values, state apportionment and the order of seats apportioned to states. Dr. Fraga asserts that his calculator successfully and exactly replicated apportionment from the 1980, 1990, 2000 and 2010 Censuses, and will thus accurately predict 2020 apportionment.<sup>64</sup> He reports his estimates of 2020 Baseline population by state and the four different Scenarios A-D of undercounting due to a citizenship question on the 2020 Census, as described above.<sup>65</sup> He further reports five apportionment scenarios: one baseline scenario and four undercount scenarios.<sup>66</sup>

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<sup>63</sup> <https://www.census.gov/topics/public-sector/congressional-apportionment/about.html>; <https://www.census.gov/topics/public-sector/congressional-apportionment/about/computing.html>. If ‘n’ is the number of seats a state will have if it gains a seat, the geometric mean of a state’s current and next seats is  $\sqrt{n(n-1)}$ . The priority value for a state’s second seat is its population divided by  $\sqrt{2(2-1)}$  or 1.414, the priority value for its third seat is its population divided by  $\sqrt{3(3-1)}$  or 2.449, etc. Each state’s apportionment population is its total resident population including citizens and noncitizens, plus Armed Forces and federal civilian employees stationed outside the U.S. (and dependents living with them) that can be allocated back to a home state. The District of Columbia is excluded from apportionment population.

<sup>64</sup> Fraga Report, pp. 20-21.

<sup>65</sup> Fraga Report Table 3, p. 18.

<sup>66</sup> Fraga Report Table 4, p. 23.



59. I created a spreadsheet calculator that replicates the 1990, 2000 and 2010 priority values and apportionment published by the Bureau of the Census.<sup>67</sup> The calculator can be used to estimate 2020 apportionment given inputs of each state's estimated apportionment population in 2020. The calculator can further be used to assess the effects of different population estimates on 2020 apportionment. My calculator replicates the apportionment formula described by Dr. Fraga, with one exception. I correct for the illogical methodology employed by Dr. Fraga for calculating the decline in overseas population between 2010 and 2020, and I thus obtain a different Baseline apportionment population. However, the use of a marginally different (higher) Baseline apportionment population is immaterial as it does not change apportionment relative to Dr. Fraga's Baseline.
60. Dr. Fraga relies on Census data indicating that military personnel in FY2010 (293,600) accounted for 28 percent of the total overseas population counted for apportionment (1,042,523). Dr. Fraga also uses Department of Defense estimates indicating that overseas military personnel in FY2018 (198,700) were 67.7 percent of the overseas military personnel in FY2010 (293,600)—32.3 percent lower. To project total overseas population counted for apportionment in 2020, Dr. Fraga assumes the total declines by 18.96 percent ( $67.7\% \times 28\% = 18.96\%$ ) from the FY2010 level.<sup>68</sup> This percentage reduction is mathematically equivalent to subtracting FY2018 military personnel stationed overseas from the FY2010 population ( $1,042,523 - 198,700 = 843,823$ ) to estimate the total 2020 overseas population.<sup>69</sup> This calculation implies the following assumptions: the number of

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<sup>67</sup> <https://www.census.gov/data/tables/1990/dec/1990-apportionment-data.html>, <https://www.census.gov/data/tables/2000/dec/2000-apportionment-data.html> and <https://www.census.gov/data/tables/2010/dec/2010-apportionment-data.html> respectively.

<sup>68</sup> Dr. Fraga's 18.96% calculation is imprecise as well as illogical. The more precise (but still illogical) calculation is  $198,700 / 1,042,523 = 19.06\%$ .

<sup>69</sup> If  $P_{2010}$  is FY2010 overseas population,  $M_{2010}$  is FY2010 overseas military and  $C_{2010}$  is overseas civilian employees, then  $P_{2010} = M_{2010} + C_{2010}$ . Similarly,  $P_{2020}$  is the 2020 overseas population to be estimated and  $M_{2020}$  is 2020 overseas military, proxied by FY2018 overseas military. Dr. Fraga estimates:

$$\begin{aligned}
 P_{2020} &= P_{2010} * \left(1 - \frac{M_{2010}}{P_{2010}} * \frac{M_{2020}}{M_{2010}}\right) \\
 &= P_{2010} * \left(1 - \frac{M_{2020}}{P_{2010}}\right)
 \end{aligned}$$

non-military federal personnel overseas is expected to remain constant between FY2010 and 2020; and, the military personnel overseas will not be counted. These assumptions do not provide a reasonable basis for estimation of the total overseas population in 2020.

61. If the number of federal civilian employees overseas between 2010 and 2020 declines at a rate equal to that of overseas military personnel between FY2010 and FY2018, the 2020 overseas population will be equal to FY2010 overseas population scaled by the ratio of FY2018 to FY2010 military personnel:  $1,042,523 * (198,700 / 293,600) = 705,549$ . If the number of federal civilian employees overseas remains constant between 2010 and 2020 and only the overseas military population declines, the 2020 overseas population is equal to FY2010 overseas population less the change in military personnel between FY2010 and FY2018:  $1,042,523 - (293,600 - 198,700) = 947,623$ . Dr. Fraga provides no evidence regarding changes in the number of overseas civilian federal employees. I rely on the latter estimate of 2020 federal overseas employees (947,623) for my apportionment calculations except for replication of Professor Fraga's 2020 Baseline, as discussed above.
62. I use my apportionment calculator to estimate 2020 apportionment using Dr. Fraga's 2020 Baseline population estimates. I replicate Dr. Fraga's results with the exception of Florida, to which Professor Fraga apportions 28 seats and I apportion 29 seats. Since the total number of seats generated by my calculator is 435 and the total generated by his formula is 434, there appears to be an error in Dr. Fraga's calculator or table.<sup>70</sup>

## 2. Dr. Fraga's estimates of the change in apportionment of congressional seats are likely overstated

63. As described above, the apportionment calculation is based on the relative size of state populations. Therefore, states that are more likely to experience undercounts

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$$= P_{2010} * \left( \frac{P_{2010} - M_{2020}}{P_{2010}} \right) = P_{2010} - M_{2020}.$$

<sup>70</sup> Two of the other scenarios reported in Table 4 of the Fraga Report (Scenario A and Scenario D) also result in a total of 434 not 435 apportioned seats, confirming that there appears to be an error in his calculations.

(and/or larger undercounts) if a citizenship question is reinstated, are more likely to experience a negative change in apportionment.

64. Dr. Fraga's changes in apportionment due to a citizenship question are likely to be overstated because his estimates of the impact of a citizenship question on 2020 Census counts are overstated. States that are impacted by the reinstatement of a citizenship question will experience a reduction in their calculated priority values in the apportionment formula. These states are more likely to have an overstated impact on their congressional apportionment.
65. For example, in Scenarios A and B, Dr. Fraga finds that the reinstatement of a citizenship question would have a disproportionate effect on the enumeration of California's population.<sup>71</sup> In Scenario B, after approximating the estimated effect of NRFU counts from Dr. Barreto's survey, the population undercount due to a citizenship question is -8.48 percent. This undercount results in a three-seat loss in California relative to the 53 congressional seat allocation, which assumes projected 2020 Census counts without reinstatement of a citizenship question (an estimate based on historical census counts).<sup>72</sup> If undercounts are fully mitigated, these losses will not be observed.

### **3. In the Historical NRFU-Rate Scenario there are no changes to congressional seat apportionment**

66. I project population undercounts under the Historical NRFU-Rate Scenario. I report in Table 2, below, 2020 baseline population projections and Historical NRFU-Rate Scenario population projections by state. For the state of California, this implies that, before imputation, the population not counted is equal to 0.024 percent of the baseline projection.
67. Table 3 reports projected population and congressional seat apportionment by state for the 2020 baseline and the Historical NRFU-Rate Scenario. Under the Historical

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<sup>71</sup> Fraga Report, p. 22.

<sup>72</sup> Fraga Report, pp. 22 and 23.

NRFU-Rate Scenario, there are no changes in congressional seat apportionment due to the inclusion of a citizenship question for any state, including California.

**B. Impact Evaluation on the Distribution of Federal Domestic Assistance**

68. Dr. Reamer purports to quantify the impact of the reinstatement of a citizenship question in the 2020 Census on the distribution of federal domestic assistance. The formulas for the three programs Dr. Reamer evaluates depend on population data. The impact evaluation Dr. Reamer conducts depends on comparing assistance distribution based on projected 2020 population counts and state-level undercount estimates from Dr. Fraga's Scenarios C and D, which purportedly result from the reinstatement of a citizenship question. Dr. Reamer's reliance on overstated estimates of undercounts attributable to reinstatement of a citizenship question results in overstated impact evaluations.
69. To illustrate how Dr. Fraga's underestimation of NRFU success contributes to Dr. Reamer's predictions, I replicate the methodology of Dr. Reamer's analysis but assume the levels of undercounts in the Historical NRFU-Rate Scenario.
70. Tables 4, 5 and 6 report fiscal-year 2016 changes in grant amounts in Dr. Reamer's analysis and in the Historical NRFU-Rate Scenario due to the estimated Census undercount by state for Title I LEA Grants, WIC Supplemental Food Grants, and Social Services Block Grants. In the Historical NRFU-Rate Scenario, following the reinstatement of a citizenship question in the 2020 Census and without accounting for imputation, the state of California is expected to lose 0.01 percent of the funds it would be expected to receive without the citizenship question.

I declare under penalty of perjury that the foregoing report is true and correct.

Executed on October 31, 2018.

A handwritten signature in black ink, appearing to read "Stuart Gurrea", is written over a horizontal line.

Stuart D. Gurrea, Ph.D.

**Table 2**  
**Historical NRFU - Rate 2020 Projections**

State	Baseline	Historical NRFU - Rate Scenario	
	Population	Population	Undercount (%)
Alabama	4,909,797	4,909,629	-0.003%
Alaska	742,898	742,858	-0.005%
Arizona	7,302,219	7,301,223	-0.014%
Arkansas	3,041,609	3,041,449	-0.005%
<b>California</b>	<b>40,393,990</b>	<b>40,384,382</b>	<b>-0.024%</b>
Colorado	5,793,650	5,793,076	-0.010%
Connecticut	3,582,310	3,581,942	-0.010%
Delaware	984,226	984,150	-0.008%
Florida	21,668,695	21,665,660	-0.014%
Georgia	10,696,376	10,695,392	-0.009%
Hawaii	1,434,604	1,434,394	-0.015%
Idaho	1,817,286	1,817,173	-0.006%
Illinois	12,710,600	12,709,130	-0.012%
Indiana	6,735,594	6,735,256	-0.005%
Iowa	3,182,422	3,182,268	-0.005%
Kansas	2,932,387	2,932,172	-0.007%
Kentucky	4,491,934	4,491,795	-0.003%
Louisiana	4,722,625	4,722,463	-0.003%
Maine	1,331,859	1,331,823	-0.003%
Maryland	6,136,606	6,135,883	-0.012%
Massachusetts	6,973,938	6,973,132	-0.012%
Michigan	10,041,036	10,040,528	-0.005%
Minnesota	5,672,759	5,672,407	-0.006%
Mississippi	2,981,765	2,981,707	-0.002%
Missouri	6,153,347	6,153,134	-0.003%
Montana	1,067,836	1,067,815	-0.002%
Nebraska	1,951,944	1,951,799	-0.007%
Nevada	3,158,362	3,157,776	-0.019%
New Hampshire	1,358,014	1,357,960	-0.004%
New Jersey	9,073,181	9,071,745	-0.016%
New Mexico	2,093,728	2,093,522	-0.010%
New York	19,917,386	19,914,095	-0.017%
North Carolina	10,515,309	10,514,530	-0.007%
North Dakota	783,517	783,494	-0.003%
Ohio	11,756,941	11,756,582	-0.003%
Oklahoma	4,000,423	4,000,180	-0.006%
Oregon	4,310,660	4,310,260	-0.009%
Pennsylvania	12,804,528	12,803,910	-0.005%
Rhode Island	1,064,874	1,064,759	-0.011%
South Carolina	5,201,635	5,201,402	-0.004%
South Dakota	889,060	889,026	-0.004%
Tennessee	6,826,163	6,825,834	-0.005%
Texas	29,403,076	29,397,798	-0.018%
Utah	3,211,388	3,211,109	-0.009%
Vermont	621,076	621,061	-0.002%
Virginia	8,629,657	8,628,858	-0.009%
Washington	7,617,840	7,616,927	-0.012%
West Virginia	1,781,002	1,780,977	-0.001%
Wisconsin	5,837,508	5,837,238	-0.005%
Wyoming	598,982	598,963	-0.003%

Sources: REAMER\_000051\_Fraga\_NonResponseScenarios 9-17-18 Reamer analysis.xlsx; NRFU Success Rate.docx

Notes: Non-citizen population calculated from Fraga 2020 Baseline Population and Scenario C ("Response Population") as follows:

$$\begin{aligned}
 \text{Response Population} &= \text{Baseline Population} * (1 - (5.8\%) * (\text{Non} - \text{citizen population})) \\
 \text{Non} - \text{citizen population}(\%) &= \frac{\text{Baseline Population} - \text{Response Population}}{\text{Baseline Population}} * \frac{1}{.058} \\
 \text{Non} - \text{citizen population}(\#) &= (\text{Baseline Population} - \text{Response Population}) * \frac{1}{.058}
 \end{aligned}$$

Undercount percentages before imputation.

**Table 3**  
**Historical NRFU - Rate 2020 Apportionment**

State	<i>Baseline</i>		<i>Historical NRFU - Rate Scenario</i>	
	Population	Apportionment	Population	Apportionment
Alabama	4,909,797	6	4,909,629	6
Alaska	742,898	1	742,858	1
Arizona	7,302,219	10	7,301,223	10
Arkansas	3,041,609	4	3,041,449	4
<b>California</b>	40,393,990	53	40,384,382	53
Colorado	5,793,650	8	5,793,076	8
Connecticut	3,582,310	5	3,581,942	5
Delaware	984,226	1	984,150	1
Florida	21,668,695	29	21,665,660	29
Georgia	10,696,376	14	10,695,392	14
Hawaii	1,434,604	2	1,434,394	2
Idaho	1,817,286	2	1,817,173	2
Illinois	12,710,600	17	12,709,130	17
Indiana	6,735,594	9	6,735,256	9
Iowa	3,182,422	4	3,182,268	4
Kansas	2,932,387	4	2,932,172	4
Kentucky	4,491,934	6	4,491,795	6
Louisiana	4,722,625	6	4,722,463	6
Maine	1,331,859	2	1,331,823	2
Maryland	6,136,606	8	6,135,883	8
Massachusetts	6,973,938	9	6,973,132	9
Michigan	10,041,036	13	10,040,528	13
Minnesota	5,672,759	7	5,672,407	7
Mississippi	2,981,765	4	2,981,707	4
Missouri	6,153,347	8	6,153,134	8
Montana	1,067,836	1	1,067,815	1
Nebraska	1,951,944	3	1,951,799	3
Nevada	3,158,362	4	3,157,776	4
New Hampshire	1,358,014	2	1,357,960	2
New Jersey	9,073,181	12	9,071,745	12
New Mexico	2,093,728	3	2,093,522	3
New York	19,917,386	26	19,914,095	26
North Carolina	10,515,309	14	10,514,530	14
North Dakota	783,517	1	783,494	1
Ohio	11,756,941	15	11,756,582	15
Oklahoma	4,000,423	5	4,000,180	5
Oregon	4,310,660	6	4,310,260	6
Pennsylvania	12,804,528	17	12,803,910	17
Rhode Island	1,064,874	1	1,064,759	1
South Carolina	5,201,635	7	5,201,402	7
South Dakota	889,060	1	889,026	1
Tennessee	6,826,163	9	6,825,834	9
Texas	29,403,076	39	29,397,798	39
Utah	3,211,388	4	3,211,109	4
Vermont	621,076	1	621,061	1
Virginia	8,629,657	11	8,628,858	11
Washington	7,617,840	10	7,616,927	10
West Virginia	1,781,002	2	1,780,977	2
Wisconsin	5,837,508	8	5,837,238	8
Wyoming	598,982	1	598,963	1
<b>Total</b>	<b>330,908,620</b>	<b>435</b>	<b>330,870,646</b>	<b>435</b>

Sources: REAMER\_000051\_Fraga\_NonResponseScenarios 9-17-18 Reamer analysis.xlsx; Fraga Report Table 4 and p.21

NRFU Success Rate.docx

[https://www.census.gov/2010census/pdf/2010\\_Census\\_Federally\\_Affiliated\\_Overseas\\_Count\\_Operation\\_Assessment.pdf](https://www.census.gov/2010census/pdf/2010_Census_Federally_Affiliated_Overseas_Count_Operation_Assessment.pdf)

<https://www.census.gov/data/tables/2010/dec/2010-apportionment-data.html>

<https://www.census.gov/topics/public-sector/congressional-apportionment/about/computing.html>

**Table 4**  
**Change in Allocation of Title I LEA Grants due to**  
**Census Undercount, by State, FY2016 -- Ranked**

<b>State</b>	<b>Dr. Reamer's Scenario C (5.8% undercount non-citizens)</b>	<b>Dr. Reamer's Scenario D (5.8% undercount non-citizens + 86.63% NRFU)</b>	<b>Historical NRFU - Rate Scenario (5.8% undercount non-citizens + 98.58% NRFU)</b>
California	-\$15,278,566	-\$2,028,420	-\$215,226
<b><i>California Grant Loss</i></b>	<b><i>-0.87%</i></b>	<b><i>-0.12%</i></b>	<b><i>-0.01%</i></b>
Texas	-\$6,281,372	-\$833,930	-\$88,484
New York	-\$4,081,573	-\$541,880	-\$57,496
Florida	-\$1,437,825	-\$190,889	-\$20,254
New Jersey	-\$1,058,374	-\$140,512	-\$14,909
Nevada	-\$601,183	-\$79,815	-\$8,469
Arizona	-\$530,756	-\$70,464	-\$7,477
Hawaii	-\$110,966	-\$14,732	-\$1,563
Washington	-\$87,233	-\$11,581	-\$1,229
Maryland	-\$41,825	-\$5,553	-\$589
Illinois	-\$36,997	-\$4,912	-\$521
Massachusetts	-\$13,244	-\$1,758	-\$187

Sources: 1. REAMER\_000051\_Fraga\_NonResponseScenarios 9-17-18 Reamer analysis.xlsx

2. NRFU Success Rate.docx

3. REAMER\_000049\_Title I 09-17-18.xlsx

4. <https://www.census.gov/data/datasets/2014/demo/saife/2014-state-and-county.html>



**Table 5**  
**Change in Fair Allocation of WIC Supplemental Food Grants**  
**due to Census Undercount, by State, FY2016 -- Ranked**

<b>State</b>	<b>Dr. Reamer's Scenario C (5.8% undercount non-citizens)</b>	<b>Dr. Reamer's Scenario D (5.8% undercount non-citizens + 86.63% NRFU)</b>	<b>Historical NRFU - Rate Scenario (5.8% undercount non-citizens + 98.58% NRFU)</b>
California	-\$6,411,831	-\$850,759	-\$90,263
<b><i>California Grant Loss</i></b>	<b><i>-0.81%</i></b>	<b><i>-0.11%</i></b>	<b><i>-0.01%</i></b>
Texas	-\$1,348,106	-\$178,875	-\$18,978
New York	-\$1,035,875	-\$137,446	-\$14,583
Florida	-\$295,665	-\$39,231	-\$4,162
New Jersey	-\$266,955	-\$35,421	-\$3,758
Nevada	-\$150,348	-\$19,949	-\$2,117
Arizona	-\$90,639	-\$12,027	-\$1,276
Hawaii	-\$32,187	-\$4,271	-\$453

Sources: 1. REAMER\_000051\_Fraga\_NonResponseScenarios 9-17-18 Reamer analysis.xlsx

2. NRFU Success Rate.docx

3. REAMER\_000050\_WIC 09-17-18.xlsx

4. <https://fns-prod.azureedge.net/sites/default/files/wic/2013%20StateLevel-Estimates-of-Infants-and-Pre-School-Age-Children-at-or%20....pdf>

**Table 6**  
**Change in Allocation of Social Services Block Grants**  
**due to Census Undercount, by State, FY2016 -- Ranked**

<b>State</b>	<b>Dr. Reamer's Scenario C (5.8% undercount non-citizens)</b>	<b>Dr. Reamer's Scenario D (5.8% undercount non-citizens + 86.63% NRFU)</b>	<b>Historical NRFU - Rate Scenario (5.8% undercount non-citizens + 98.58% NRFU)</b>
California	-\$1,683,013	-\$223,450	-\$23,709
<b><i>California Grant Loss</i></b>	<b><i>-0.88%</i></b>	<b><i>-0.12%</i></b>	<b><i>-0.01%</i></b>
Texas	-\$623,855	-\$82,828	-\$8,789
New York	-\$351,201	-\$46,628	-\$4,948
Florida	-\$182,317	-\$24,206	-\$2,568
New Jersey	-\$137,277	-\$18,226	-\$1,934
Nevada	-\$71,482	-\$9,491	-\$1,007
Arizona	-\$52,963	-\$7,032	-\$746
Hawaii	-\$15,904	-\$2,112	-\$224
Washington	-\$14,209	-\$1,887	-\$200
Maryland	-\$7,285	-\$967	-\$103
Illinois	-\$6,266	-\$832	-\$88
Massachusetts	-\$3,351	-\$445	-\$47

Sources: 1. REAMER\_000051\_Fraga\_NonResponseScenarios 9-17-18 Reamer analysis.xlsx  
2. NRFU Success Rate.docx  
3. REAMER\_000053\_Social Service Block Grants 09-17-18.xlsx

## **Exhibit 1**

### **Curriculum Vitae of Stuart D. Gurrea, Ph.D.**

## CURRICULUM VITÆ

**Stuart D. Gurrea**

**Office Address** Economists Incorporated  
101 Mission Street, Suite 1000  
San Francisco, CA 94105  
(415) 975-3225  
gurrea.s@ei.com

**Education** Ph.D., Economics, Northwestern University, July 2001  
Dissertation: *The Economics of International Airline Code Sharing*  
  
M.A., Economics, Northwestern University, June 1996  
  
B.A., Economics, University of Seville, Spain, June 1994

**Fellowships, Honors, and Awards** Fall 2000: Transportation Center Dissertation Fellowship, Northwestern University  
  
1995 – 1997: Northwestern University Graduate Fellowship

**Fields of Concentration** Industrial Organization, Applied Econometrics and Finance

**Professional Experience** 2001 – present: Vice President, Economists Incorporated, San Francisco, CA  
  
1997 – 2000: Research Assistant, Department of Economics and Kellogg Graduate School of Business, Northwestern University, Evanston, IL  
  
1999: Global Markets Research Analyst, Zacks Investment Research, Inc., Chicago, IL  
  
1997: Teaching Assistant, Department of Economics, Northwestern University, Evanston, IL  
  
1994 – 1995: Economic Analyst, Official Chamber of Commerce, Seville, Spain

- Publications** “Has Collusion Hindered Financial Market Reform?” (with Jonathan A. Neuberger), *The Exchange*, Insurance and Financial Services Committee, American Bar Association, Section of Antitrust Law, Spring 2018
- “Financial Markets Reform and Alleged Dealer-Bank Collusion,” *Economists Ink* (with Jonathan A. Neuberger), Winter 2018
- “Chapter 8: Overcharges,” (with Henry McFarland, Kelsey Shannon and Clarissa Yeap) in Proving Antitrust Damages, American Bar Association, Section of Antitrust Law, 3d ed., 2017
- “Goldman Sachs Settles Allegations of Derivatives Benchmark Rate Manipulation,” *Economists Ink* (with Jonathan Neuberger), Spring 2017
- “Different Competitive Effects in Financial Rate-Setting Cases,” *Economists Ink* (with Jonathan Neuberger), Summer 2016
- “Perspectives On Four Years Of The CFPB’s Consumer Complaints Database,” (with Jonathan A. Neuberger), *The Exchange*, Insurance and Financial Services Committee, American Bar Association, Section of Antitrust Law, Spring 2016
- “Foreign Exchange Manipulation and Economic Harm,” *Economists Ink* (with Jonathan Neuberger), Summer 2015
- “Foreign Exchange Manipulation and Economic Harm,” (with Jonathan A. Neuberger), *The Exchange*, Insurance and Financial Services Committee, American Bar Association, Section of Antitrust Law, Spring 2015
- “Rate Manipulation and Antitrust Liability,” *Economists Ink* (with Jonathan Neuberger), Summer 2014
- “Economic Harm and LIBOR Manipulation,” *The Exchange*, Section of Antitrust Law, Insurance and Financial Services Committee, The American Bar Association (with Jonathan Neuberger), Spring 2013
- “The (Mis)Use of Screens in Economic Analysis,” *Economists Ink* (with Jonathan Neuberger), Spring 2012

**Publications** Market Power Handbook: Competition Law & Economic  
**(Continued)** Foundations (2d ed.) American Bar Association, Section of  
 Antitrust Law, (contributor), March 2012

“Economic Harm and the LIBOR Scandal,” *Economists Ink* (with Jonathan Neuberger), Winter 2012

“The Economics of Google’s Acquisition of ITA Software,” *Icarus, The Newsletter of the Communications & Digital Technology Industries Committee* (with Gloria Hurdle), ABA Section of Antitrust Law, Spring 2011

“Remedies in Google’s Acquisition of ITA Software,” *Economists Ink* (with Gloria Hurdle), Spring 2011

“Sensitivity Analysis in Economic Modeling,” *Economists Ink* (with Jonathan A. Neuberger), Winter 2010

“The Two Faces of Credit Default Swaps: Risk Management Versus Speculation,” *Economists Ink* (with Jonathan A. Neuberger), Summer 2010

“The Determinants of Broadband Adoption: The Chinese and Indian Experience,” *Icarus, The Newsletter of the Communications & Digital Technology Industries Committee*, ABA Section of Antitrust Law, Fall 2009

“Comparing China’s New Antimonopoly Law and India’s Amended Competition Act,” *Economists Ink* (with Su Sun), Spring 2009

“China’s New Antimonopoly Law and India’s Amended Competition Act: How New Antitrust Regimes in These Important Emerging Markets May Impact High Tech Companies,” *Icarus, The Computer & Internet Committee Newsletter* (with Su Sun), ABA Section of Antitrust Law, November 2008

“Price Squeezes – Are They Detrimental to Consumer Welfare?” *Communications Industry Committee Newsletter*, American Bar Association, Section of Antitrust Law, Fall 2008

“Imperfect Information, Entry, and the *Merger Guidelines*,” (with Barry C. Harris and Allison M. Ivory) in Issues in Competition Law and Policy, Volume 2, pp. 1589-1611, American Bar Association, Section of Antitrust Law, 2008

- Publications (Continued)** “Imperfect Information, Entry and The Merger Guidelines,” *Economists Ink* (with Barry C. Harris and Allison M. Ivory), Summer 2006
- “International Airline Code Sharing and Entry,” in Darin Lee, ed., Advances in Airline Economics, Chapter 5, Vol. 1, Elsevier, 2006
- “The Antitrust Economics of Intellectual Property,” (with Phil B. Nelson and Robert D. Stoner), in Antitrust and Intellectual Property: A Guide for Practitioners, American Bar Association, Section of Antitrust Law, 2006
- “Using Simulation And Econometric Models to Estimate The Effects of a Trade Restraint,” *Economists Ink* (with Henry B. McFarland and Robert D. Stoner), Spring 2005
- “The Economic Effects of the Filed Rate Doctrine on Wholesale Electricity Markets,” *The Energy Antitrust News*, (with Manny A. Macatangay), Spring 2005
- “EU Guidelines on Competition and Technology Transfer Agreements,” *Economists Ink*, Spring 2004
- “Economic Analysis and Sampling of Populations,” *Economists Ink*, Winter 2004
- “Event Study Methodology in Securities Litigation,” *Economists Ink*, Winter 2004
- “Coordinated Interaction and Clayton §7 Enforcement,” *George Mason Law Review*, Volume 12, number 1, pp. 89-118, Fall 2003, (with Bruce M. Owen)
- “Coordinated Effects and Merger Policy Enforcement,” *Economists Ink*, (with Bruce M. Owen), Fall 2003
- The Economics of Innovation: A Survey, American Bar Association, Section of Antitrust Law, (contributor), July 2002
- “The Intersection of Antitrust and Intellectual Property Law,” *Economists Ink* (with Tessie Su), Spring/Summer 2001
- “Measuring the Competitive Effects of International Airline Code Sharing,” *Economists Ink*, Fall 2001

**Presentations**

“Financial Derivatives,” presented at The U.S. Department of Justice, Washington D.C., October 11, 2017

“Financial Innovation, Banking and The Subprime Financial Crisis,” presented at The U.S. Department of Justice, Washington D.C., May 13 and 14, 2010

“Strategic Departure-time Differentiation And Low Cost Carrier Competition,” presented at the panel on airline economics, Annual Meeting of The Southern Economic Association, Charleston, SC, November 18, 2006

Discussant of “An Empirical Investigation into The Causes of Flight Delays” by Nicolas Rupp, and chaired panel on airline economics at The Annual Meeting of The Southern Economic Association, Charleston, SC, November 18, 2006

“Economic Tools in Antitrust Analysis. The Use of Econometric Tools in Antitrust,” presented at the Second Coloquio Foro Competencia, October 21, 2005, Buenos Aires, Argentina

“Low Cost Carrier Competition And Flight Departure-Time Differentiation,” presented at the Third Conference of the Japan Economic Policy Association, Meiji University, Tokyo, Japan, November 13, 2004

“Airline Code Sharing and Entry Deterrence.” Paper delivered at the 7th Conference of Industrial Organization, Universitat Pompeu Fabra, Barcelona, September 2001

“Cooperation Among Competitors: Evidence from Airline Alliances.” Paper delivered at Northwestern University’s Transportation Center, Fall 2000

**Expert Witness  
Deposition and  
Trial Testimony**

*William A. Leonard, Jr. Chapter 7 Trustee for the Estate of Paul Anthony Morabito v. Paul Anthony Morabito et al.* – For Plaintiff, conducted valuation review and offered valuation opinion of spectrum-related lines of business. Filed expert report, United States Bankruptcy Court, District of Nevada, October 2016. Testified at Deposition, May 2017



**Expert Witness  
Deposition and  
Trial Testimony  
(continued)** *Fridman v. Wells Fargo Bank, N.A.* – For defendant, analysis of economic damages related to dispute over mortgage payments and mortgage records. Testified at deposition and trial, Superior Court of the State of California, County of Los Angeles, Central District, April 2015 and July 2015

**Selected  
Consulting  
Matters** *Loreley Financing (Jersey) NO. 28, Limited vs. Merrill Lynch, Pierce, Fenner & Smith Incorporated et al.* – For Plaintiff, analysis of causation and damages in relation to alleged misrepresentations and omissions in the marketing and sale of notes of a collateralized debt obligation

*Loreley Financing (Jersey) NO. 3, Limited et al. vs. Wells Fargo Securities, LLC, et al.* – For Plaintiff, analysis of causation and damages in relation to alleged misrepresentations and omissions in the marketing and sale of notes of collateralized debt obligations

*BNSF Railway Company and Norfolk Southern Railway Company vs. First Energy Generation LLC* – For Defendant, valuation of liquidated damages claim related to dispute over rail transportation agreement

*Wye Oak Technology Inc. v. The Republic of Iraq, et al.* – For Plaintiff, estimation of damages related to breach of contract, including estimation of expected future profits under the contract

*Gloria J. Jackson et al. v. The United States of America* – For Defendants, economic analysis of the determination of the appropriate prejudgment interest rate in class action lawsuit related to alleged takings of residential property

*For U.S. Department of Justice and FDIC* – Economic analysis of trading behavior in spot and options foreign exchange markets in relation to criminal investigation of front running allegations against investment bank

*FirstEnergy Generation, LLC v. BNSF Railway Company and CSX Transportation, Inc.* – For Plaintiff, determination of appropriate discount rate to bring to the present a stream of future liquidated damages payments

*For Intuit/QuickBooks* – analysis of financial disclosures and determination of the consistency of certain financial calculations with The Truth in Lending Act as implemented by the Board of Governors of the Federal Reserve System's Regulation Z

**Selected Consulting Matters (continued)** *For U.S. Department of Justice and U.S. Customs and Border Protection – Construction of database and estimation of value of vehicles imported to the U.S. by foreign car manufacturer in relation to violations of customs regulations and the Clean Air Act*

*Federal Deposit Insurance Corporation v. PricewaterhouseCoopers LLP and Crowe Horwath LLP – For plaintiff, quantification of economic harm in banking fraud case resulting from alleged failure to detect fraud*

*China Development Industrial Bank v. Morgan Stanley & Co. et al. – For plaintiff, economic analysis of mortgage securitization, structured finance, and conflicts of interest in relation to the marketing and sale of a mortgage-backed collateralized debt obligation and alleged misrepresentations*

*Navajo Health Foundation – Sage Memorial Hospital, Inc. v. Silvia Mathews Burwell, et. al. – For defendant, The United States of America, analysis of damages claims related to alleged breach of contract related to the provision of hospital services in Navajo hospital*

*Always at Market, Inc. v. United States – For defendant, conducted analysis of plaintiff's econometric model of new registrations on on-line auction site and responded to damages claims based on this model*

*Entergy Nuclear Vermont Yankee, LLC, v. The United States of America – For defendant, economic assessment of the development of a market and subsequent trading of allocation rights for pickup of spent nuclear fuel*

*Southern California Edison Company v. The United States of America – For defendant, economic assessment of the development of a market and subsequent trading of allocation rights for pickup of spent nuclear fuel*

*Gilberte Jill Kelley, and Scott Kelley, M.D. v. The Federal Bureau of Investigation et al. – For defendant, economic analysis of lost earnings claim related to alleged violation of the Privacy Act and the General Petreaus scandal*

**Selected Consulting Matters (continued)** *The West Virginia Investment Management Board and The West Virginia Consolidated Public Retirement Board v. The Variable Annuity Life Insurance Company* – For defendant, analysis of alleged damages to retirement fund resulting from receiving fragmented distribution of investment funds rather than lump sum payment

*LaDon Powell and Margeret Dennis vs. Ocwen Loan Servicing* – For defendant, economic analysis of late payment fees in response to breach of contract claims related to reinstatement agreement. Filed expert report, United States District Court for the District of Wyoming, May 2015

*In re Goldman Sachs Group, Inc. Securities Litigation* – For plaintiff class, economic analysis of mortgage securitization, structured finance, and conflicts of interest in relation to the creation of four mortgage-backed collateralized debt obligations

*Clear-View Technologies v. John H. Rasnick et al.* – For plaintiff, estimated damages related to interference in funding of startup business. Computation required conducting business valuation

*Matthew Burnett et al. v. Robert Bosch LLC, USA* – For defendant, conducted statistical analysis to assess impact on sparkplug prices of alleged false marketing practices to evaluate the economic basis for class certification

*Valuation of Mitchell Woods Pharmaceuticals LLC* – Conducted economic valuation of early stage pharmaceutical company developing drug to combat various types of cancer

*Starr International Company Inc. v. The United States of America* – For defendants, economic analysis of the determination of the appropriate prejudgment interest rate in class action lawsuit related to alleged takings of AIG stock during the 2008-2009 financial crisis

*For Millicom International Services, LLC.* – Co-authored the study “Assessing the Competitiveness of the Mobile Telephone Industry in Paraguay”

*Scott J. Bloch v. U.S. Office of Personnel Management* – For defendants, economic assessment of lost income and lost reputation monetary claims

**Selected Consulting Matters (continued)** *Weili Dai, Sehat Sutardja, and Sutardja Family Partners v. Goldman Sachs & Co., Bradley Defoor, and Graham Brandt* – For claimants in FINRA arbitration, quantification of economic damages related to margin calls in the midst of the 2007-2008 financial crisis

*The Economic Impact of the SEC's Proposed Rule on Required Pay Ratio Disclosure* – For the Center On Executive Compensation, study of the economic effects of mandatory compensation disclosures pursuant to the Dodd-Frank Wall Street Reform and Consumer Protection Act

*In re Text Messaging Antitrust Litigation* – For plaintiffs, economic analysis of liability and damages related to alleged collusion among wireless SMS text messaging service providers in the U.S.

*Rothschild Capital Partners, LP, et. al., v. Gorfine, Schiller & Gardyn, P.A., et. al.* – For defendants, economic analysis of damages claim related to lost business opportunities

*Meda AB v. 3M Company, 3M Innovative Properties Company, and Riker Laboratories, Inc.* – For plaintiffs, quantification of damages associated with the withholding of material information during the purchase of 3M's European pharmaceutical business

*Securities and Exchange Commission v. Brian H. Stoker* – For plaintiff, analysis of adverse selection in creation of a synthetic collateralized debt obligation squared

*Entergy Gulf States, Inc. and Entergy Louisiana, LLC v. The United States of America* – For defendant, economic analysis of plaintiffs claim for interest on damages

*Portland General Electric Company et al. v. The United States of America* – For defendant, economic assessment of the development of a market and subsequent trading of allocation rights for pickup of spent nuclear fuel

*Sacramento Municipal Utility District. v. The United States of America* – For defendant, economic assessment of the development of a market and subsequent trading of allocation rights for pickup of spent nuclear fuel

- Selected Consulting Matters (continued)**
- Kenneth D. Klaas et al., v. Vestin Mortgage Inc., et al.* – For defendants, economic analysis of contract damages claims in hard money lending industry
- Entergy Corporation and Affiliated Subsidiary Companies vs. Commission of Internal Revenue* – For defendants, analysis of plaintiffs’ evaluation of decommissioning funds transferred as part of the nuclear plant acquisition
- Novartis Pharmaceuticals Corporation v. Mylan Pharmaceuticals Inc. and Mylan Inc.* – For defendants, evaluation of competitive effects of foreclosure of generic fluvastatin drug
- Tyr Sport, Inc. v. Warnaco Swimwear, Inc. United States Swimming, Inc. et al.* – Analysis on behalf of defendants in response to antitrust liability claims
- In re Korean Airlines Co., Ltd. Antitrust Litigation* – For plaintiffs, economic analysis of alleged agreement between Korean Air Lines Co., Ltd. and Asiana Airlines, Inc. to raise prices and the effects of that agreement on purchasers of airline services in class action suit
- Kansas Gas And Electric v. The United States of America* – For defendant, economic assessment of the development of a market and subsequent trading of allocation rights for pick-up of spent nuclear fuel
- Burlington Northern Santa Fe Railway* – Study estimating the cost of capital
- Pacific Gas And Electric Company v. The United States of America* – For defendant, economic assessment of the development of a market and subsequent trading of allocation rights for pick-up of spent nuclear fuel in remanded case
- Yankee Atomic, Connecticut Yankee Atomic Power Company, Maine Yankee Atomic Power Company v. United States* – For defendant, economic assessment of the development of a market and subsequent trading of allocation rights for pick-up of spent nuclear fuel in remanded case
- United States of America v. Ralph Cioffi and Matthew Tannin* – Economic analysis of hedge fund operations

**Selected  
Consulting  
Matters  
(continued)**

*Charles Felton et al., v. Vestin Realty Mortgage II, et al.* – For defendants, economic analysis of contract damages claims in hard money lending industry

*National Fire Insurance Co. of Pittsburgh, PA vs. Puget Plastics Corporation et al.* – Economic analysis of lost profits and diminution in business value

*Consolidated Edison Company of New York And Entergy Nuclear Generation Company v. The United States of America* – For defendant, economic analysis of alleged diminution in proceeds from sale of nuclear assets because of partial breach of contract

*Arizona Public Service Company v. The United States of America* – For defendant, analysis of damages in connection with partial breach of the contract for disposal of spent nuclear fuel between plaintiff and the Department of Energy (“DOE”)

*Deutscher Tennis Bund, et al., v. ATP Tour Inc.* – Analysis of antitrust liability on behalf of ATP in response to claims of monopolization

*Southern California Company v. The United States of America* – For defendant, analysis of damages in connection with partial breach of the contract for disposal of spent nuclear fuel between plaintiff and the Department of Energy (“DOE”)

*Dominion Resources, Inc. v. The United States of America* – For defendant, analysis of damages in connection with partial breach of the contract for disposal of spent nuclear fuel between plaintiff and the Department of Energy (“DOE”)

*MGP Ingredients, Inc. v. Mars, Inc. and S&M NuTec, LLC* – Analysis of damages for defendant in patent infringement and misappropriation of trade secrets suit in the pet food industry

*Dairyland Power Cooperative v. The United States of America* – Economic assessment of the development of a market and subsequent trading of allocation rights for pick-up of spent nuclear fuel



**Selected Consulting Matters (continued)** *Boston Edison Company And Entergy Nuclear Generation Company v. The United States of America* – For defendant, economic analysis of alleged diminution in proceeds from sale of nuclear assets because of partial breach of contract

*Clinton Reilly v. Medianews Group et al.* – Analysis of the effects of the acquisition of several newspapers in the San Francisco Bay Area in response to antitrust suit

*Republica Oriental del Uruguay v. Chemical Overseas Holdings, Inc. et al.* – For plaintiff, calculation of economic injury in the midst of the Argentine financial crisis in fraud suit

*Pacific Gas And Electric Company v. The United States of America* – Economic assessment of the development of a market and subsequent trading of allocation rights for pick-up of spent nuclear fuel

*Northern States Power Company v. The United States of America* – For defendant, analysis of damages in connection with partial breach of the contract for disposal of spent nuclear fuel between plaintiff and the Department of Energy (“DOE”)

*Hawaii Renewable Portfolio Standards* – For The Public Utilities Commission of the state of Hawaii, optimal policy design to implement renewable portfolio standards

*An Economic Analysis of the Competitive Effects of the SBC/AT&T and Verizon/MCI Mergers on the Internet Backbone Market* – Paper submitted before the Infocomm Development Authority of Singapore (IDA) and to the U.S. Federal Communications Commission

*British Telecommunications Analysis* – Analysis of competitive effects in the market for special local access, provision of enterprise telecommunications services and Internet backbone following the proposed mergers between SBC and AT&T, and Verizon and MCI

*Southern Nuclear Operating Company v. The United States of America* – For defendant, analysis of damages in connection with partial breach of the contract for disposal of spent nuclear fuel between plaintiff and the Department of Energy

**Selected Consulting Matters (continued)** *DRAMS* – On behalf of Respondent Hynix Semiconductors, paper submitted before the Japanese Ministry of Finance and Ministry of Economy, Technology and Industry in response to econometric analysis evaluating the price effects of alleged subsidies in the market for DRAMs

*Video Rental Industry Competition Analysis* – Statistical analysis for delineating relevant markets and estimating unilateral effects in relation to the acquisition of Hollywood Entertainment. Analysis in the context of Hart-Scott-Rodino review by the Department of Justice

*Dr. Steven Nadler v. Aspen Valley Hospital, Inc. et al.* – For defendant, analysis of monopolization and exclusionary conduct allegations in emergency professional orthopedic services

*Martin Leach v. Ford Motor Company* – For defendant, economic analysis of the reasonableness of a non-compete clause and event study analysis to evaluate the impact of direct competition from former executives

*Advertising Effectiveness* – Statistical analysis of survey data to determine effectiveness of alternative advertising campaigns in influencing teenager’s attitudes, beliefs and intentions toward smoking and tobacco

*Canadian Lumber International Trade Study* – Study of the effect of the U.S.-Canada Softwood Lumber Agreement (“SLA”), a tariff-rate quota, on the volume and price of Canadian lumber imports. Presented before the U.S. International Trade Commission

*Westways World Travel, et al. v. AMR Corp.* – For defendant, economic analysis of damages claims in class action suit related to American Airlines’ ticketing

*Consumer Product Merger* – Demand estimation using scanner sales data for delineating relevant markets and estimating unilateral effects of the merger

*Barron Aircraft, L.L.C. v. Dassault Falcon Jet Corp.* – For plaintiff, design, implementation and statistical analysis of survey of business-jet aircraft professionals



**Selected Consulting Matters (continued)** *Tobacco Merger* – Demand estimation using scanner sales data for delineating relevant markets and estimating unilateral effects of the merger

*EchoStar Satellite L.L.C. vs. Viacom Inc., et al.* – For defendants, economic analysis of EchoStar’s allegation that Viacom illegally tied the sale of some of its cable programs to its CBS broadcast retransmission rights

*Federal Communications Commission Inquiries into Broadcast Television* – Econometric analyses regarding media ownership rules prepared on behalf of Fox, NBC, and Viacom/CBS for FCC filings

*Daisy L. Holoman et al. v. Pfizer Inc. and Warner Lambert Corporation* – For defendants, quantification of damages in class action suit related to a diabetes prescription medication

*Indiana Michigan Power Company v. The United States of America* – For defendant, analysis of damages in connection with partial breach of the contract for disposal of spent nuclear fuel between plaintiff and the Department of Energy

*Diane L. Walter-Brock v. Ford Motor Company et al.* – For defendants, analysis of the economics of punitive damages in a product liability suit

*Julia Tennin and Patricia Alexander v. Ford Motor Company* – For defendants, analysis of the economics of punitive damages in a product liability suit

For defendant (an internet service provider marketing cell phone service) analyzed plaintiff’s damages claims for compensation in a cell phone service false advertising class action suit

*R. Straman Co. and Newport Convertible Engineering, Inc. v. Volkswagen of America, et al.* – For defendants, analysis concerning antitrust liability and antitrust injury in monopolization claim

*Bureau of Public Enterprises, Federal Republic of Nigeria* – Report and recommendations for competition policy and anti-trust reform in Nigeria

- Selected Consulting Matters (continued)**
- Newhall Land and Farming Co. v. Kerr McGee Operating Corporation, et al.* – For defendant, analysis concerning the economics of punitive damages
  - Thayer/Patricof Education Funding L.L.C. v. Fred Pryor et al.* – For Plaintiff, analysis of damages related to an acquisition in an accounting fraud suit
  - Marzia Spielholz, et al. v. Los Angeles Telephone Company, et al.* – For defendant, analyzed plaintiff's damages claims for compensation in a cell phone service false advertising class action suit
  - Cardiac Institute General Partnership v. Banner Health System et al.* – Competition analysis for defendant in monopolization claim
  - Braintree Laboratories, Inc. v. Schwarz Pharma, Inc.* – For defendant (and counter-claim plaintiff), demand estimation for delineation of relevant antitrust product market and analysis of market power in pharmaceuticals patent infringement and monopolization suit
  - William H. McKee and Paul R. Estrada v. Heller, Ehrman, White & McAuliffe et al.* – For defendants, business valuation of Monsterbook.com in a negligent misrepresentation and fraud suit
  - Exxon Chemical Plant Fire* – For defendant, analysis concerning the economics of punitive damages
  - Karlsson et al. v. Ford Motor Company et al.* – Analysis for defendants of liability in a product liability suit and the economics of punitive damages
  - Michael Meitus, et al. v. Dain Rauscher Wessels, Dain Rauscher Corporation and Dain Rauscher Inc.* – Competitive analysis of the brokerage industry and valuation of acquired investment bank
  - American Institute of CPAs* – Study of the provision of non-audit services by auditors evaluating efficiency effects and impact on audit quality
  - Competition for Video Programming* – Analysis of the effects of exclusive distribution contracts and the FCC's restrictions affecting cable operators

<b>Selected Consulting Matters (continued)</b>	<i>New Skies Satellites Position Paper</i> – Analysis of the adverse competitive impact of Export-Import Bank financing of iPSTAR satellite on the Asian satellite services market
	<i>ID Security Systems Canada v. Checkpoint Systems, Inc.</i> – Analysis for defendant of restraint of trade and tying claims in security tag systems
<b>Professional Societies</b>	<i>American Economic Association</i>
	<i>American Finance Association</i>
	<i>American Bar Association, Antitrust Section</i>

## **Exhibit 2**

### **Documents and Data Relied Upon and Considered**

#### **Depositions, Exhibits, and Other Testimony**

Defendants' Rule 26(A)(2)(C) Expert Disclosure of John M. Abowd, State of New York, et al., v. United States Department of Commerce, et al., No. 18-cv-2921, September 21, 2018.

Rule 26(A)(2)(B) Expert Report and Declaration of Andrew Reamer, PhD, Case No. 3:18-cv-01865 and 5:18-cv-02279 (NDCA), September 18, 2018 and workpapers.

Rule 26(A)(2)(B) Expert Report and Declaration of Bernard L. Fraga, PhD, Case No. 3:18-cv-01865, September 19, 2018.

Rule 26(A)(2)(B) Expert Report and Declaration of Matthew Barreto, PhD, September 7, 2018 and workpapers.

Rule 26(A)(2)(B) Expert Report and Declaration of Andrew Reamer, PhD, Civil Action No. 1:18-cv-2921 and 1:18-cv-05025 (SDNY), September 7, 2018.

Rule 26(A)(2)(B) Expert Report and Declaration of Christopher Warshaw, PhD, Civil Action No. 1:18-cv-2921 and 1:18-cv-05025 (SDNY), September 7, 2018.

Expert Report Errata of Andrew Reamer, PhD, Civil Action No. 1:18-cv-2921 (SDNY), September 18, 2018.

#### **Articles, Books, and Other Sources**

Memorandum from John Abowd and David Brown, September 28, 2018 ("NRFU Success Rate.docx").

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