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14 IN THE UNITED STATES DISTRICT COURT  
15 FOR THE DISTRICT OF ARIZONA

16	Maria M. Gonzalez, et al.,	)	No. CV-06-1268-PHX-ROS(Lead)
		)	No. CV-06-1362-PCT-JAT(Cons.)
17	Plaintiffs,	)	No. CV-06-1575-PHX-EHC(Cons.)
		)	
18	vs.	)	GONZALEZ PLAINTIFFS'
		)	RESPONSE IN OPPOSITION TO
19	State of Arizona, et al,	)	STATE DEFENDANTS' REPLY IN
		)	SUPPORT OF MOTION TO
20	Defendants.	)	STRIKE PORTIONS OF ITCA's
		)	FACTUAL SUBMISSION

21  
22 (Assigned to the  
23 Honorable Roslyn O. Silver)

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**I. INTRODUCTION**

On June 26, 2008 this Court ordered Defendants to file a Reply in support of their Motion to Strike Portions of ITCA’s Factual Submission, *see* Dkt. Entry No. 851 (“Motion to Strike”), and to address “among other things, whether Plaintiffs’ expert reports are unreliable under Fed. R. Evid. 703.” Dkt. Entry No. 876.

Although the Court’s Order directed Defendants to address ITCA’s factual submission, and ITCA’s only expert witness is Tony Sissons, Defendants instead ignored the Court’s directive, claiming that “[t]he Court ordered briefing on whether *Gonzalez* plaintiffs’ expert reports are unreliable under Fed. R. Evid. 703.” *See* Dkt. Entry No. 879, Reply in Support of Motion to Strike Portions of ITCA Plaintiff Factual Submission in Response to Motion for Summary Judgment by Defendant Arizona Secretary of State (“Reply”), at 2 (emphasis added).

Furthermore, Defendants did not argue in their Motion to Strike that Gonzalez Plaintiffs’ expert reports were unreliable. *See* Dkt. Entry No. 851 at 2-3 (arguing only that Gonzalez Plaintiffs’ expert reports are hearsay). Defendants attempt to raise new arguments in their Reply that are not presented in their original Motion to Strike.

For the reasons set out below, Defendants have neither addressed the relevant legal standard governing the admission of expert witness testimony under Fed. R. Evid. 703 nor satisfied that standard with respect to their request to exclude Gonzalez Plaintiffs’ expert witnesses Dr. Louis Lanier and Dr. Rodolfo Espino.

**II. ARGUMENT**

A. Defendants’ Reply Neither Addresses nor Satisfies Their Burden Under Fed. R. Evid. 703

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Fed. R. Evid. 703 provides:

The facts or data in the particular case upon which an expert bases an opinion or inference may be those perceived by or made known to the expert at or before the hearing. If of a type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject, the facts or data need not be admissible in evidence in order for the opinion or inference to be admitted. Facts or data that are otherwise inadmissible shall not be disclosed to the jury by the proponent of the opinion or inference unless the court determines that their probative value in assisting the jury to evaluate the expert's opinion substantially outweighs their prejudicial effect.

Rule 703 directs itself to the question whether otherwise inadmissible evidence, most commonly hearsay evidence, may be admitted at trial if it forms the basis of an expert opinion. “The central purpose of Rule 703 is to promote efficiency by expanding the acceptable bases for expert testimony to include inadmissible evidence such as hearsay.” 29 CHARLES ALAN WRIGHT, VICTOR JAMES GOLD, FEDERAL PRACTICE AND PROCEDURE: EVIDENCE § 6272 (1997).

Rule 703 provides that trial courts may admit otherwise inadmissible evidence if they are “of a type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject[.]” Thus, the Court’s request for briefing on the issue “whether Plaintiffs’ expert reports are unreliable under Fed. R. Evid. 703” focuses on the reliability of the information underlying those expert reports. *See U.S. v. W.R. Grace*, 504 F.3d 745, 761 (9<sup>th</sup> Cir. 2007) (reversing in part and remanding case when district court excluded expert testimony without conducting appropriate Rule 703 inquiry into reliability of evidence relied upon by experts).

1 Defendants have not, and cannot, challenge the reliability of the information  
2 relied upon by Drs. Lanier and Espino in their expert reports because Defendants  
3 supplied that material themselves. In order to form their conclusions, Dr. Lanier and  
4 Dr. Espino analyzed the Arizona voter rolls provided to Plaintiffs by State Defendants.  
5 Dr. Lanier further analyzed rejected voter registration forms and uncounted conditional  
6 provisional ballots provided to Plaintiffs by County Defendants.  
7

8 Nowhere in their Reply do Defendants suggest that the information they  
9 provided to Plaintiffs is unreliable or not “of a type reasonably relied upon by experts in  
10 the particular field in forming opinions or inferences upon the subject[.]” Fed. R. Evid.  
11 703. Thus, Defendants cannot assert now that the expert reports should be excluded  
12 under Fed. R. Evid. 703.  
13

14 B. Defendants’ Attempt to Convert Their Reply Into an Untimely Motion  
15 Under Rule 702 is Unsuccessful

16 Instead of following the Court’s Order to focus their Reply on “whether  
17 Plaintiffs’ expert reports are unreliable under Fed. R. Evid. 703,” Dkt. Entry No. 876 at  
18 1, Defendants instead try to argue that two of Gonzalez Plaintiffs’ expert reports should  
19 be excluded under Rule 702. For this reason alone, the Reply should be struck for  
20 failure to comply with the Court’s Order. However, the Reply also lacks merit because  
21 it does not address the relevant legal standards under Fed. R. Evid. 702.  
22

23 Defendants request the Court exclude the reports of Dr. Louis Lanier and Dr.  
24 Rodolfo Espino because “they (1) are not supported by the experts’ own stated data; and  
25  
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1 (2) are not based upon reliable methodology.” *See* Dkt. Entry No. 879 at 2. These are  
2 arguments properly made under Fed. R. Evid. 702 which provides:

3 If scientific, technical, or other specialized knowledge will assist the trier  
4 of fact to understand the evidence or to determine a fact in issue, a witness  
5 qualified as an expert by knowledge, skill, experience, training, or  
6 education, may testify thereto in the form of an opinion or otherwise, if  
7 (1) the testimony is based upon sufficient facts or data, (2) the testimony  
8 is the product of reliable principles and methods, and (3) the witness has  
9 applied the principles and methods reliably to the facts of the case.

10 Defendants do not contend that Dr. Lanier and Dr. Espino lack the necessary  
11 expertise to conduct their studies. Instead, Defendants focus their Rule 702 arguments  
12 on the methodology and factual determinations made by these experts.

13 First, Defendants’ argue that the facts developed by Dr. Lanier and Dr. Espino do  
14 not demonstrate disparate impact on Latino voters and prospective voters. However,  
15 arguments regarding the persuasiveness of evidence developed by expert witnesses  
16 belong at trial and not in a motion to exclude evidence. *See Dukes v. Wal-Mart, Inc.*,  
17 509 F.3d 1168, 1179 (9<sup>th</sup> Cir. 2007) (“Wal-Mart’s contention that the district court was  
18 required to subject Dr. Bielby’s testimony to the *Daubert* test, simply because the  
19 conclusion he reached seemed unpersuasive absent certain corroborating evidence, is  
20 misplaced. *See Daubert*, 490 U .S. at 595 (“The focus, of course, must be solely on  
21 principles and methodology, not on the conclusions that they generate.”)).

22 Furthermore, Defendants’ Reply is certainly not the place to assert that because  
23 Arizona’s population is rising, and thus overall voter registration is rising, Plaintiffs  
24 cannot demonstrate that Prop 200 has had a disparate negative impact on Latinos. *See*  
25 Dkt. Entry No. 879 at 2-3. In light of the fact that Arizona’s population continues to  
26

1 grow and increase the state’s voter registration, it is specious to argue that this growth  
2 precludes any finding that Latinos have experienced a disparate negative impact on their  
3 political participation as a result of Prop 200.

4 C. Defendants’ Motion and Reply do not Address any Expert Analysis of  
5 Rejected Voter Registration Forms or Uncounted Conditional Provisional  
6 Ballots

7 Although Defendants state broadly that “the data disclosed in the reports of Drs.  
8 Lanier and Espino do not support their conclusions of disparate impact,” Dkt. Entry No.  
9 879 at 2, it is important to note at the outset that Defendants do not discuss, or even  
10 acknowledge, the Gonzalez Plaintiffs’ expert analyses of rejected voter registration  
11 forms and uncounted conditional provisional ballots produced by the Counties.

12 After Gonzalez Plaintiffs received the final unredacted voter registration forms  
13 from the County Defendants in November and December 2007, they produced expert  
14 analysis of these forms demonstrating that Latinos have experienced a disparate  
15 negative impact as a result of Prop 200’s voter registration provisions.<sup>1</sup> This analysis  
16 was completely separate from the analysis conducted by Dr. Lanier for his January 4,  
17 2008 report and is not addressed by Defendants in their Reply. *See, e.g., id.* at 2-6  
18 (criticizing Dr. Lanier’s January 4, 2008 report and not addressing the analyses of Dr.  
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23 <sup>1</sup> Gonzalez Plaintiffs requested rejected voter registration forms as early as July  
24 10, 2006 in their First Request for Production of Documents to Maricopa County. The  
25 counties collectively refused to produce unredacted rejected voter registration forms for  
26 over one year until the Court ordered them to do so on August 30, 2007. *See* 8/30/07  
Hr’g Tr. at 25:20 – 26:24 (ordering County Defendants to produce unredacted rejected  
voter registration forms).

1 Lanier conducted after receiving rejected voter registration forms and uncounted  
2 conditional provisional ballots).

3 In order to perform his analysis of rejected voter registration forms, Dr. Lanier  
4 first had to receive the unredacted registration forms, the last of which were served on  
5 Gonzalez Plaintiffs in late November 2007 and early December 2007. He then needed  
6 to transfer the information from those 38,000 forms into a database that would allow  
7 him to examine information in the aggregate, including determining the number of  
8 forms submitted by Spanish surnamed applicants and how many applicants  
9 subsequently re-applied successfully. Dr. Lanier's analysis of these forms was  
10 embodied in a report timely served on Defendants on March 28, 2008.<sup>2</sup>

11  
12 In his study, Dr. Lanier analyzed 31,015 properly completed voter registration  
13 forms that were rejected by County Defendants because they did not satisfy Prop 200's  
14 proof of citizenship requirements. Dr. Lanier compared the individuals who submitted  
15 these rejected forms to the voter registration applicants who successfully registered in  
16 the same time period. Dr. Lanier found, and Defendants do not challenge, that Latinos  
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20 <sup>2</sup> One week before the Court's deadline, Plaintiffs served Defendants with Dr.  
21 Lanier's report analyzing the first batch of rejected voter registration forms data-entered  
22 into his database. On the March 28, 2008 deadline, Plaintiffs served Defendants with a  
23 report reflecting Dr. Lanier's analysis of the 31,015 forms data-entered to that date.  
24 Finally, on April 25, Plaintiffs served Defendants with a slight update to Dr. Lanier's  
25 earlier findings on rejected voter registration forms as a result of the addition of  
26 approximately 535 forms to the 31,015 previously analyzed. The addition of these 535  
forms did not change Dr. Lanier's analysis or conclusions but simply brought his report  
in line with the total number of rejected voter registration forms that had finally been  
data-entered.

1 were *more* likely than non-Latinos to be rejected for voter registration because of Prop  
2 200's registration requirements. *See* Gonzalez Plaintiffs' Corrected SJ Exs. 572, 573.

3  
4 Dr. Lanier further examined the group of people who were rejected for voter  
5 registration because of Prop 200 and then made a second application and were  
6 successful in registering. Among this group, Dr. Lanier found, and Defendants do not  
7 challenge, that Latinos were *less* likely than non-Latinos to make a second and  
8 successful voter registration application. *Id.*

9  
10 Dr. Lanier concluded that because Latinos were more likely to be rejected for  
11 voter registration on Prop 200 grounds, and less likely to register successfully after  
12 being rejected, Latinos experienced a disparate negative impact on voter registration  
13 because of Prop 200's registration requirements. Defendants neither address nor contest  
14 Dr. Lanier's conclusions and the analysis underlying these conclusions.

15  
16 Similarly, Dr. Lanier analyzed uncounted conditional provisional ballots  
17 produced by County Defendants. Dr. Lanier found, and Defendants do not challenge,  
18 that Latinos cast 10.3 percent of uncounted conditional provisional ballots in the 2006  
19 General Election. Because Latinos comprised only 2.6 percent to 4.2 percent of voters  
20 in that election, Dr. Lanier concluded that the effect of the Prop 200 ID requirement fell  
21 disproportionately on Latino voters. *See* Gonzalez Plaintiffs' Corrected SJ Exs. 573,  
22 574, 576. Dr. Lanier further found, and Defendants do not contest, that Latino rejected  
23 registration applicants and uncounted conditional provisional ballots come from areas of  
24 Arizona where the population: is less likely to speak English well, possesses less  
25

1 schooling, and earns a lower household income than the averages for the state and are  
2 also from areas where the population is more highly Latino in makeup. *See* Gonzalez  
3 Plaintiffs’ Corrected SJ Ex. 574 at 5. Defendants do not mention or challenge these  
4 findings or the analysis underlying these findings in their Reply. *See generally* Dkt.  
5 Entry No. 879.

6  
7 D. Defendants Limit Their Criticism of Dr. Lanier to his Analysis Preceding  
8 the Release of Rejected Voter Registration Forms by the Counties

9 Ignoring Dr. Lanier’s findings that the evidence produced by the County  
10 Defendants demonstrate disparate negative impact of Prop 200 on Latinos, Defendants  
11 instead claim that, with respect to Dr. Lanier’s January 4, 2008 report, which was  
12 written before he had the opportunity to analyze the documents produced by the  
13 counties, “Dr. Jeffrey Zax [] demonstrated that Dr. Lanier’s ‘predictions’ were based on  
14 misspecified regression analyses.” However, Dr. Lanier’s timely filed rebuttal reports  
15 of March 7, 2008 and May 23, 2008 demonstrated that Dr. Zax’s critique and  
16 suggestions as to alternative methods of analysis were irrelevant and could not  
17 accomplish the goal of isolating the effect of Prop 200. *See* Dkt. Entry Nos. 570, 575.

18  
19 In his reports, Dr. Zax, testifying for Defendants, did not criticize the use of  
20 regression analysis by Dr. Lanier and did not claim that regression analysis is not well-  
21 accepted in the field of economics and political science. Instead, Dr. Zax contends that  
22 Dr. Lanier should have used different variables in his regressions.

23  
24 In those two rebuttal reports, Dr. Lanier easily explained that Dr. Zax was  
25 scientifically incorrect in his assertion that since there are eight years in the data used in  
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1 Dr. Lanier's initial report regressions, there must be seven independent variables that  
2 must be used in a regression model of voter registration behavior. *See id.*

3 Dr. Zax produced no scientific basis for his claim that Dr. Lanier's regression  
4 must include seven variables as opposed to the variables used by Dr. Lanier. Dr. Zax  
5 cited no scholarly works, instead simply claiming Dr. Lanier had committed an error.  
6 Dr. Zax performed no regression analysis himself to support his claim that Dr. Lanier's  
7 specifications yielded inaccurate results, admitting in his last declaration that he had  
8 produced "no evidence as to whether [Dr. Lanier's] analyses or conclusions would be  
9 contradicted by regressions which were specified correctly." *See* Dkt. Entry No. 880,  
10 Declaration of Dr. Jeffery Zax, at 3.  
11

12 Finally, Dr. Zax conceded in his deposition that if Dr. Lanier had used the seven  
13 year-specific variables discussed by Dr. Zax, those variables would have removed Dr.  
14 Lanier's ability to produce a coefficient for the effect of Prop 200 on voter registration.  
15 *See* Dep. of Dr. Jeffery Zax, 3/12/08, 68:25 -72:15, attached as Ex. A.  
16

17 Dr. Lanier properly employed a time trend variable in his regression analysis in  
18 order to be able to separate the effects of Prop 200 from normal fluctuations in voter  
19 registration that occur over time. Dr. Zax admitted that using the year-specific dummy  
20 variables he advocated would have eliminated the time trend variable employed by Dr.  
21 Lanier. *See* Ex. A at 68:25-69:14. Dr. Lanier also properly employed a presidential  
22 year variable in his regression analysis in order to be able to separate the effects of Prop  
23 200 from normal fluctuations in voter registration that occur in presidential election  
24 years. Dr. Zax admitted that using the year-specific dummy variables he advocated  
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1 would have eliminated the presidential year variable employed by Dr. Lanier. *See Ex.*  
2 *A at 69:15-19.*

3 Dr. Zax finally admitted he had conducted no analysis to test whether his  
4 criticisms of Dr. Lanier, and his claims that Dr. Lanier should have used different  
5 specifications for his regression, would have yielded different or more accurate results.  
6 *See Ex. A at 72:14-15.* Thus, not only did Dr. Zax claim that Dr. Lanier should have  
7 conducted his regressions so as *not* to produce an estimate of the specific effects of Prop  
8 200 on voter registration, Dr. Zax produced no analysis himself to demonstrate that Dr.  
9 Lanier's estimates were inaccurate in any way.<sup>3</sup>

11 Similarly, Dr. Zax's criticism of Dr. Lanier's test of statistical significance is not  
12 properly the basis of a motion to exclude evidence because it goes to the weight of the  
13 evidence, not its admissibility. Furthermore, Dr. Zax provided no evidence that the test  
14 of statistical significance used by Dr. Lanier was inaccurate because Dr. Zax performed  
15 no test of his own. In deposition, Dr. Zax admitted that he had not devised a test of  
16 statistical significance for the situation involving changes in voter registration following  
17 Prop 200 and might not be able to accomplish such a task. *See Ex. A at 134:22* ("I  
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21 <sup>3</sup> When asked in deposition if his proposed model (with seven, year-specific dummy  
22 variables) could discern the effect of Prop 200, Dr. Zax testified that: his instinct  
23 suggested that it could be done; that he had not attempted to do so; that he had only  
24 conceived of his method for discerning the specific effect of Prop 200 in the preceding  
25 12 minutes of the deposition (although this discernment is the primary objective of the  
26 regression analysis he was critiquing and, presumably, the regression analysis he was  
proposing); that he had not examined his proposed method's properties formally; and  
that there may be subtleties in this problem which he had not recognized. *See Ex. A at*  
*72:3 – 74-19.*

1 personally have not worked through how one would or even if one could account for it  
2 appropriately.”)

3 In his rebuttal reports, Dr. Lanier explained that Dr. Zax’s criticisms of his test  
4 of statistical significance missed a practical point of the regression analysis and that the  
5 binomial test of proportions employed by Dr. Lanier was appropriate to the task at hand.  
6 *See Gonzalez Plaintiffs’ Corrected SJ Exs. 570, 575.* Dr. Zax’s criticism of the use of  
7 the binomial test of proportions, without an alternative suggestion and unaccompanied  
8 by any analysis, falls far short of demonstrating any flaws in Dr. Lanier’s analysis. Dr.  
9 Zax’s repeated complaints that Dr. Lanier has not changed his analysis in response to  
10 Dr. Zax’s criticisms similarly does not demonstrate any deficiencies in Dr. Lanier’s  
11 analysis. *See Dkt. Entry No. 880 at 1-3.*

12 Finally, Defendants’ attempt to minimize the demonstrated effects of Prop 200  
13 on registration does not help their Motion to Strike or Reply. Dr. Zax asserts in his  
14 untimely declaration that the number of voters and voter registration applicants rejected  
15 because of Prop 200 is “negligible” when compared to the state’s voter rolls. *See id.* at  
16 4. It is unclear what scientific analysis Dr. Zax performed to conclude that over 40,000  
17 individuals represent a “negligible” number but in any event the statement does not go  
18 to the question of admissibility of Dr. Lanier’s reports under Fed. R. Evid. 702.

19 Similarly, whether or not the total number of voters registered in Arizona is increasing  
20 over time does nothing to undermine Dr. Lanier’s methodology or conclusion that  
21 Latinos represent a disproportionately high number of those prevented from voting by  
22 Prop 200. *See id.* According to the U.S. Census, Arizona’s voting age population rose  
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1 by more than 447,000 between 2004 and 2008.<sup>4</sup> This increase in population, and the  
2 overall increase in voter registration associated with the growth in Arizona's population,  
3 does not explain away the fact that Prop 200 resulted in the rejection of over 37,000  
4 voter registration applications and 4,000 voters who went to the polls on Election Day.

5 E. Defendants' Criticisms of Dr. Espino's Reports Misapprehend the Nature of his  
6 Analysis

7 Dr. Espino examined actual voter registration applications that were accepted by  
8 the counties in Arizona 941 days before and 941 days after the implementation of Prop  
9 200. This analysis did not involve using regression analysis to estimate a number, trend  
10 or effect. Dr. Espino examined real numbers of people joining the voter rolls  
11 throughout the state and did not estimate that number.  
12

13 Dr. Espino found that in the wake of Prop 200, approximately 18 less Latinos  
14 were registered in Arizona each week and 133 less non-Latinos per week were  
15 registered when compared to the period before Prop 200. Because Latinos comprise a  
16 smaller proportion of Arizona's eligible voter population, Dr. Espino noted that these  
17 declines represent a greater negative effect on Latinos than non-Latinos, although both  
18 groups were affected by Prop 200. *See* Gonzalez Plaintiffs' Corrected SJ Ex. 565 at 5-  
19 6.  
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21  
22 <sup>4</sup> The U.S. Census reports that Arizona's adult population rose from 4,092, 291 to  
23 4,668,889 between 2004 and 2007. *See* American Community Survey, U.S. Census, found at  
24 [http://factfinder.census.gov/servlet/ADPTable?\\_bm=y&-geo\\_id=04000US04&-qr\\_name=ACS\\_2004\\_EST\\_G00\\_DP1&-ds\\_name=&-lang=en&-redoLog=false](http://factfinder.census.gov/servlet/ADPTable?_bm=y&-geo_id=04000US04&-qr_name=ACS_2004_EST_G00_DP1&-ds_name=&-lang=en&-redoLog=false), attached as  
25 Ex. C, and <http://www.census.gov/popest/states/asrh/tables/SC-EST2007-01.csv>, attached as  
26 Ex. D.

1 Dr. Espino also looked at voter registrations in individual counties and observed  
2 that in certain counties, such as Greenlee and Yuma, Latino voter registrations dropped  
3 significantly as a proportion of all registrations following implementation of Prop 200.  
4 *See id.* Dr. Espino found that in Greenlee County, Latinos comprised 25.76 of the  
5 voters registered in the 31 months preceding Prop 200 but only 18.58 percent of the  
6 voters registered in the 31 months following Prop 200. Similarly, Dr. Espino found that  
7 in Yuma County, Latinos comprised 37.18 percent of the voters registered prior to  
8 January 1, 2005 but only 31.67 percent of the voters registered in the period following  
9 Prop 200. *See Gonzalez Plaintiffs' Corrected SJ Ex. 565 at 6.*

11 Defendants' expert Dr. Zax does not contest these findings. Instead, Dr. Zax  
12 directs his arguments to the weight of the evidence found by Dr. Espino. As explained  
13 above, arguments regarding the weight of evidence are for trial, not a pre-trial motion to  
14 strike evidence under Rule 702.

16 For example, Dr. Zax argues in his February 15, 2008 report that Dr. Espino  
17 should exclude all voter registration data from his analysis that appears in the *year and*  
18 *a half* before implementation of Prop 200 and the *year and a half* following  
19 implementation of Prop 200. *See Expert Report of Dr. Jeffery Zax, 2/15/2008, attached*  
20 *as Ex. B.* Dr. Zax provides no scholarly support for his contention that Dr. Espino  
21 should delete important data from his analysis. Furthermore, his suggested deletions  
22 render an analysis of the effects of Prop 200 impossible.

24 In addition, Dr. Zax argues that Dr. Espino should have performed regression  
25 analysis on the numbers of people registering to vote in the period before and after Prop  
26

1 200. Dr. Espino correctly explained that such analysis is unnecessary when all the  
2 numbers are known to the expert and there is no need to estimate the number of voter  
3 registrations that were successful after Prop 200.

4 Both of Dr. Zax's criticisms (that Dr. Espino should have deleted data and that he  
5 should have performed regressions) are based on a fundamental misunderstanding of  
6 Dr. Espino's analysis. Dr. Espino analyzed whether Latino registrations declined *as a*  
7 *percent* of total registrations in the wake of Prop 200. Because Dr. Espino focused his  
8 analysis on Latino registrations within the context of all registrations, he did not need to  
9 delete data to control for similar time periods. As explained by Dr. Espino:  
10

11 We can expect normal cyclical ups and downs to the total number of  
12 voters registered in a jurisdiction - usually an upswing in the early  
13 part of an election year and then a down surge following the election  
14 date. However, if all individuals, irrespective of race, are being  
15 registered at the same proportion, then we should see a constant line  
across in time. Clearly, that is not the case [with] the percentage of  
Hispanic voters in each of the 62 months examined here.

16 *See Gonzalez Plaintiffs' Corrected SJ Ex. 561 at 2.*

17 Similarly, because Dr. Espino examined the decline in Latino registrations as a  
18 percent of total registrations in the periods before and after Prop 200, he did not need to  
19 perform regressions to examine time trends. His comparison of registrations in the  
20 period of 31 months preceding Prop 200 and the 31 months following Prop 200, and his  
21 conclusion that Latino registrations were proportionally lower following Prop 200, does  
22 not require an analysis within these periods of the relationship between Prop 200 and  
23 individual months.  
24

1           Nevertheless, Dr. Espino rebutted Dr. Zax's arguments by performing regression  
2 analyses on periods before Prop 200 and periods after in his March 7, 2008 rebuttal  
3 report. *See* Gonzalez Plaintiffs' Corrected SJ Ex. 565 at 11-18. These regressions were  
4 correctly specified despite Dr. Zax's later arguments that they were not. In response to  
5 Dr. Zax's contention that Dr. Espino excluded the intercept term for his two regressions,  
6 Dr. Espino explained that in order to provide a measure of equality between the two  
7 time periods, he choose to eliminate the intercept term. Without eliminating the  
8 intercept term, each time period would have a different intercept and, in effect, each  
9 time period would have a different starting point for the average registration rate for  
10 Hispanics and non-Hispanics, thus rendering time periods incomparable. *See* Gonzalez  
11 Plaintiffs' Corrected SJ Ex. 526 at 3-4.

12  
13           Dr. Espino furthermore has demonstrated that Dr. Zax's insistence upon fitting a  
14 single regression line to both time periods (before and after Prop 200) forces the average  
15 rate of Hispanic voter registration before Proposition 200 to influence the slope of the  
16 line in the period following implementation. In examining whether voter registration  
17 rates changed between two time periods, it is necessary to set the line for each time  
18 period separately. *See id.* at 4.

19  
20           Similar to his criticism of Dr. Lanier, Dr. Zax does not support his criticisms of  
21 Dr. Espino with any analysis of the data regarding voter registration, although it was in  
22 possession of State Defendants and certainly available to him. Instead of performing  
23 regression, Dr. Zax simply drew lines on Dr. Espino's charts using his eyes and, at  
24 times, the services of a graphic artist. Dr. Zax then admitted in deposition that the  
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26

1 charts he presented in his February 15 report did not show the results of any statistical  
2 analysis but instead showed his drawing of horizontal lines across voter registration  
3 data, without respect to whether the data itself would have yielded zero slope lines in a  
4 regression analysis. *See* Ex. B; Ex. A at 183:24-187:20. Dr. Zax further admitted that  
5 he had never done such a thing before in his professional career. *Id.* at 185:25-186:5.  
6

7 In the end, Defendants' attempt to exclude Dr. Lanier's and Dr. Espino's  
8 analyses is based on a failure to explore the experts' analyses and conclusions in  
9 deposition (Defendants declined to take the depositions of both Dr. Lanier and Dr.  
10 Espino), a complete lack of evidence rebutting Dr. Lanier's and Dr. Espino's findings  
11 (Dr. Zax performed no analysis of the data in the case), and an untimely expert  
12 declaration that does not undermine the qualifications or scientific methodology of  
13 Gonzalez Plaintiffs' experts.  
14

15 F. Gonzalez Plaintiffs Request the Court Strike the June 27, 2008  
16 Declaration of Dr. Jeffrey Zax as an Untimely Expert Report

17 Finally, Gonzalez Plaintiffs move to strike the untimely declaration of Dr. Zax  
18 submitted on June 27, 2008 in support of Defendants' Reply. *See* Dkt. Entry No. 880.  
19 This report arrives long after the Court's May 9, 2008 deadline for supplementation of  
20 Defendants' expert reports. *See* Dkt. Entry No. 740.

21 Furthermore, the untimely declaration of Dr. Zax contains new, undisclosed  
22 opinions. Dr. Zax's declaration contains numerous criticisms of Gonzalez Plaintiffs'  
23 final expert reports, submitted on May 22, 2008 in compliance with the Court's Final  
24 Scheduling Order. *See* Dkt. Entry No. 880 at ¶¶10, 11, 13, 14, 15, 16, 17, and 20. The  
25 Court did not provide for any additional information from experts following the final  
26

1 supplementation deadline of June 4, 2008 and Dr. Zax's June 27 declaration contains  
2 new opinions to which Plaintiffs cannot respond. For this reason, Gonzalez Plaintiffs  
3 request that it be struck.

4 **III. CONCLUSION**

5 For the reasons set out above, Gonzalez Plaintiffs respectfully request that the  
6 Court strike the untimely declaration of Dr. Jeffrey Zax, Dkt. Entry No. 880, and deny  
7 Defendants' Motion to Strike Portions of ITCA Plaintiff Factual Submission in  
8 Response to Motion for Summary Judgment.

9 DATED this 30th day of June, 2008. Respectfully submitted,

10  
11  
12 By: s/Nina Perales  
13 Nina Perales

14 Counsel for Plaintiffs  
15 Gonzalez, et al.

16 **CERTIFICATE OF SERVICE**

17 I hereby certify that on the 30<sup>th</sup> day of June, 2008, I caused the foregoing  
18 document to be electronically transmitted to the Clerk's Office using the CM/ECF  
19 System for filing and transmittal of a Notice of Electronic Filing to CM/ECF registrants.

20 COPY of the foregoing filed electronically  
21 this 30<sup>th</sup> day of June, 2008.

22 COPY of the foregoing mailed with Notice  
23 of Electronic Filing this 30<sup>th</sup> day of June, 2008 to:

24 The Honorable Roslyn O. Silver  
25 United States District Court  
26 Sandra Day O'Connor U.S. Courthouse, Suite 624  
401 West Washington Street, SPC 59  
Phoenix, AZ 85003-2158

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s/Nina Perales  
Nina Perales

# EXHIBIT

## A

IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF ARIZONA

Case No. CV-06-1268-PHX-ROSI (Lead)  
CV-06-1362-PCT-ROS  
CV-06-1575-PCT-ROS

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DEPOSITION OF JEFFREY STEPHEN ZAX March 12, 2008

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Maria M. Gonzalez, et al.,

Plaintiffs,

vs.

State of Arizona, et al.,

Defendants.

---

APPEARANCES:

MEXICAN AMERICAN LEGAL DEFENSE AND  
EDUCATIONAL FUND

By Nina Perales, Esq.

110 Broadway, Suite 300

San Antonio, Texas 78205

Appearing on behalf of Plaintiffs.

BARBARA A. BAILEY, ESQ.

Office of the Attorney General

State of Arizona

1275 West Washington

Phoenix, Arizona 85007

Appearing on behalf of State of

Arizona and Arizona Secretary of

State.

Also Present: Louis Lanier

1 recommending -- not that I am recommending -- in  
2 the specification that I have discussed.

3           It must -- it should be clear that, as  
4 I said before, I have not set myself the task of  
5 solving this particular problem, and therefore  
6 anything I say right now is based on my analysis  
7 of the question as it's presented to me at this  
8 moment.

9           Having said that, yes, I believe there  
10 is a way to ask the question of whether Prop 200  
11 has had a consistent effect on registrations in a  
12 specification which uses dummy variables for each  
13 of the years in the sample.

14           Q       And before you mentioned that possibly  
15 by using something called a non-singular  
16 transformation or maybe even something else.  
17 However, I'm working on trying to get a more  
18 specific answer from you regarding what happens  
19 when you use year specific dummy variables. So  
20 let me ask you this question: I don't think I  
21 asked it before, but if you use a set of year  
22 specific dummy variables, are you able to measure  
23 -- no, I think I did ask you this question.

24           A       You're welcome to try again.

25           Q       I think I just need to back up a little

1 bit because I need to know if my understanding of  
2 using year specific dummy variables is correct.  
3 Is it correct for me to understand that if you use  
4 year specific dummy variables, you no longer use  
5 or no longer could use a dummy variable that  
6 measures a time trend; is that right?

7 A If you use year specific dummy  
8 variables, then the time trend variable, as I  
9 assumed Dr. Lanier constructed it, would be  
10 perfectly colinear with the time specific -- the  
11 year specific dummy variables, and therefore, yes,  
12 you would not be able to estimate a linear trend  
13 effect in the presence of a complete set of year  
14 specific dummy variables. That is certainly true.

15 Q Is it also the case that if you use  
16 year specific dummy variables, the dummy variable  
17 for Proposition 200's effect is also perfectly  
18 colinear?

19 A Yes.

20 Q And as a result, then, you would be  
21 unable to generate a coefficient for the Prop 200  
22 dummy variables; is that right?

23 A You would not be able to generate a  
24 coefficient for the Prop 200 dummy variable,  
25 that's correct.

1 Q Okay. So without the variable for  
2 Prop 200 and without the coefficient for Prop 200,  
3 is it also correct to say, then, that you would  
4 not generate a measure of the specific effect of  
5 Prop 200 when using year specific dummy variables?

6 A No.

7 Q Why is that?

8 A For example, the dummy variable for  
9 2001 would indicate the year specific level of  
10 registrations in 2001. The dummy variable for  
11 2005 would indicate the same thing for 2005.

12 The difference between those two  
13 effects would be the difference between  
14 registration levels in the first year subsequent  
15 to a presidential election prior to the  
16 implementation of Prop 200 and the first year of  
17 of a presidential election cycle subsequent to the  
18 implementation of Prop 200.

19 The comparison of those two effects  
20 therefore would hold constant the location in the  
21 presidential election cycle.

22 The difference between the magnitude of  
23 those effects would therefore incorporate any  
24 effect of Proposition 200 and any effect of a  
25 trend, if one was present.

1           The same difference -- and, again, I'm  
2 making this up as I go -- the same difference  
3 between the year effects for 2006 and 2002 would  
4 again hold constant the location in the  
5 presidential election cycle but incorporate the  
6 effects of Prop 200, if any exist, and the effects  
7 of a trend, if any exist.

8           Similarly, there is a third difference  
9 between the year specific effect for 2007 and for  
10 2003, which again purges the effects of the  
11 presidential election cycle.

12           It seems to me you have three  
13 differences there, each of which is potentially  
14 comprised of two effects. With three differences  
15 and two effects, you have an excess of information  
16 relative to the quantities you want to identify,  
17 and therefore it should be possible to identify  
18 those quantities.

19           Q       I understand that the difference in  
20 magnitude when comparing the years that you just  
21 mentioned would allow you to see the combined  
22 effects of Proposition 200 and other possible  
23 trends or other possible effects, but isn't it  
24 true that it would not generate a number  
25 associated with the effect of Prop 200? You would

1 have to infer the effect of Prop 200, in some way,  
2 but you would not get a number, a coefficient?

3 A My instinct is that you would get a  
4 number. It would not be a coefficient in the  
5 sense that it was a direct product of a regression  
6 calculation, but it would be -- my instincts tell  
7 me it would be a linear combination of regression  
8 coefficients, and therefore it would be well  
9 defined in magnitude. Moreover, its standard  
10 deviation would also be well defined, and  
11 therefore it would be possible to form appropriate  
12 tests of the statistical significance of these  
13 differences.

14 Q Did you make any such test?

15 A Certainly not.

16 Q Now, what happens if you've got effects  
17 going in different directions under the method  
18 that you just discussed? For example, what if you  
19 had voter registrations generally trending upwards  
20 in a linear fashion, and you had voter  
21 registrations dropping because of an effect of  
22 Prop 200? If that were the case, would you still  
23 be able to, looking across these years and looking  
24 at the difference in magnitude, be able to sort  
25 these things out?

1           A           The opinion that I just rendered -- the  
2 expert opinion that I just rendered in response to  
3 your previous question is valid regardless of the  
4 signs or magnitudes of the effects.

5                       If the understanding is that there are  
6 two underlying effects, and you have three  
7 measurements regarding their combination, my  
8 professional instinct is that you should be able  
9 to identify the individual effects regardless of  
10 their signs or magnitudes.

11           Q           What if there's more than two effects?  
12 What if there are other things going on? Does  
13 your confidence in this approach decrease as the  
14 number of effects increases?

15           A           My confidence in the validity of the  
16 inferences drawn from the approach that I have  
17 just outlined and my confidence in the validity of  
18 inferences derived from any other approach goes  
19 down as the number of effects we believe are  
20 present goes up.

21                       What is held constant here is the  
22 amount of data. As the amount of -- with a fixed  
23 amount of data, the more we ask it to reveal, the  
24 less confident we can be in the answer to any  
25 specific question regardless of the precise

1 specification of the analysis.

2 Q Fair enough. Would the seven years  
3 that we've been discussing that span the time  
4 before and after the implementation of Prop 200  
5 and your discussed approach of essentially pairing  
6 years with each other to observe the difference in  
7 the magnitude in voter registration, are you  
8 certain that these three pairings are enough to  
9 give you an exact sense of the effect on voter  
10 registration that Prop 200 would have as opposed  
11 to any other effect?

12 A As I said, I am creating this research  
13 design as we speak. I have not examined its  
14 properties formally. I have a very strong  
15 empirical instinct that with three measures of two  
16 effects, you have enough information, but I am  
17 open to the possibility that there are subtleties  
18 in this problem which I have not recognized in the  
19 12 minutes for which I have considered it, period.

20 Q With respect to the inclusion by  
21 Dr. Lanier of data from presidential election  
22 years, is it your testimony that the inclusion of  
23 such data in his analysis biased the analysis?

24 A No.

25 Q What is your opinion about the

1 inclusion by Dr. Lanier of the data from  
2 presidential election years?

3 A My conclusion is that the manner in  
4 which he controlled for those years in his  
5 regression specification biased the analysis.

6 Q And do you understand that Dr. Lanier  
7 did create a variable -- a dummy variable for the  
8 presidential year effect?

9 A Yes.

10 Q And is there something wrong in doing  
11 that, or is there something wrong with the way he  
12 created the variable? Help me understand here.

13 A Yes.

14 Q Yes to both?

15 A I think I interpret them as the same  
16 question. If you want me to answer them  
17 separately, it would be helpful if you would  
18 restate them.

19 Q Identify for me, if you can, the flaw  
20 in Dr. Lanier's use of a dummy variable for  
21 presidential years.

22 A Dr. Lanier's dummy variable for  
23 presidential years requires the regression to  
24 estimate a presidential year registration effect  
25 that is the same in 2000 and in 2004.

1 compare the performance of those two sets of  
2 regressions. If the second regression, in which  
3 the regressions were compelled to estimate  
4 identical effects for Hispanics and non-Hispanics,  
5 if that second set of regressions was  
6 substantially less satisfactory as an explanation  
7 of the data, then the regressions in which that  
8 restriction was not enforced, the regressions  
9 which Dr. Lanier, in fact, reports, then one could  
10 conclude that statistically significant evidence  
11 of the effects of Proposition 200 on Hispanics was  
12 different from the effects of proposition 200 on  
13 non-Hispanics. That would be the conventional  
14 direction in which to go.

15 Dr. Lanier has complicated things  
16 substantially by comparing not the effects in the  
17 regressions themselves but the effects as measured  
18 relative to some calculation of the average level  
19 of registrations for Hispanics and non-Hispanics.  
20 That introduces an additional source of  
21 statistical variation which is very difficult to  
22 account for in the testing procedure. And I  
23 personally have not worked through how one would  
24 or even if one could account for it appropriately.

25 Q So would it be correct to say that the

1 do so.

2 Q So you didn't have a chance to look at  
3 or visually inspect what the charts would look  
4 like with the excised period taken out; is that  
5 right?

6 A Well, I put my fingers over the  
7 relevant parts of Dr. Espino's graph and made an  
8 informal judgment. I did not reconstruct those  
9 graphs formally with the indicated deletions.

10 Q That's what I would have done. Okay.  
11 On Page 26, in the middle of the page, you have a  
12 paragraph that says, "Dr. Espino's conclusions  
13 regarding the alleged decline in the Hispanic  
14 proportion of registrants in Greenlee and Yuma  
15 Counties are based only on casual inspection of  
16 his figure 3." Do you see that?

17 A Yes.

18 Q Would it also be true, however, that  
19 your conclusions regarding whether or not there  
20 are changes in the proportion of Hispanic  
21 registrants, in your modified charts, are  
22 similarly based on casual inspections?

23 A Yes.

24 Q Chart 4 on Page 27, tell me how this  
25 chart came into existence, this modified chart.

1           A       This chart came into existence, was  
2           birthed, so to speak, in exactly the same fashion  
3           as all the other charts in this report. The  
4           graphic image from Dr. Espino's original report  
5           was extracted by my graphic artist colleague. She  
6           then, at my direction, overlaid these horizontal  
7           lines.

8           Q       Were you physically there with her when  
9           she overlaid the horizontal lines?

10          A       No.

11          Q       And so her decision of where to put the  
12          horizontal line was based on her recollection of  
13          your instructions?

14          A       Yes. Although, I believe there was one  
15          revision of this graph where I asked her to adjust  
16          the line to suit my sense as to where it should be  
17          located.

18          Q       Okay. And did she then go back and  
19          adjust that line?

20          A       Yes.

21          Q       Do you remember which county it was  
22          for?

23          A       No.

24          Q       And when you asked her to move the  
25          line, describe for me your sense of where it ought

1 to have been.

2 A I was attempting to place a line -- a  
3 horizontal line in each of these graphs in such a  
4 way that it seemed to be truest to the underlying  
5 sense of the data.

6 Q When you say, "underlying sense of the  
7 data," you didn't have the data, however, did you?

8 A That's correct. I had only the  
9 graphical version of the data.

10 Q So this is, in a sense, your decision  
11 based on what you could see in the chart itself  
12 about where a horizontal line might best go?

13 A Right. The placement of the horizontal  
14 line is based on my professional intuition and  
15 expertise and the graphical evidence in front of  
16 me. It is my intuitive sense as to where an  
17 actual regression line with a flat slope would end  
18 up if a computer had been asked to calculate the  
19 location of that line.

20 Q So then this is not a line that has  
21 been generated as, for example, a line of best fit  
22 by a computer program?

23 A That's correct. It is my informal  
24 attempt to simulate what that would look like.

25 Q Have you ever, in any of your scholarly

1 work, presented a horizontal line or any other  
2 line of best fit based on your visual sense of  
3 where it ought to go as opposed to based on a  
4 regression analysis?

5 A No.

6 Q The reason the line is horizontal,  
7 then, is because you started with the proposition  
8 that you would place a line with zero slope; is  
9 that right?

10 A The reason a line is horizontal is  
11 because the horizontal line represents a situation  
12 in which the proportion of Hispanics among new  
13 registrants is the same throughout the period.

14 The question I was posing here was does  
15 that scenario, the scenario described by that  
16 assumption, seem consistent with the actual  
17 pattern of registrations or inconsistent? The  
18 interest in the horizontal line, therefore, was  
19 the extent to which the horizontal line seems to  
20 capture a lot or a little of what the graph of  
21 actual registration ratios seems to be expressing.

22 Q So would it be true to say, then, that  
23 before you placed the line down, you had already  
24 decided it would be a zero slope line?

25 A I had already decided that the relevant

1 comparison was between the actual experience and  
2 what the experience would have been like had the  
3 ratio of Hispanics among all registrants been the  
4 same throughout the period.

5 Q And thus would have generated a zero  
6 slope line?

7 A Yes.

8 Q Did your colleague, who placed the  
9 line, have the capacity to tilt the line up or  
10 down?

11 A She's a wizard. I imagine she can do  
12 almost anything.

13 Q But you feel fairly confident that she  
14 didn't tilt the line one way or the other when she  
15 placed it into the chart?

16 A Yes. These lines look appropriately  
17 horizontal to me, certainly horizontal enough to  
18 make the comparison with the level of precision  
19 that's possible given the precision that's  
20 presented to us in the actual data.

21 Q Could it also be possible that if the  
22 regressions were run and the lines of best fit  
23 placed into Figure 3 of Dr. Espino's report, that  
24 they would not have a zero slope?

25 A I think that's a very interesting

**EXHIBIT**

**B**

**EXPERT REPORT AND APPENDICES  
ON BEHALF OF DEFENDANT IN  
MARIA M. GONZALEZ, ET AL. V. STATE OF ARIZONA, ET AL.  
No. CV06-1268-PHX-ROS**

Jeffrey S. Zax, Ph. D.

15 February 2008

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I am a Professor of Economics and the Associate Chair of the Department of Economics at the University of Colorado at Boulder. I received my Ph.D. degree in Economics from Harvard University in 1984. I teach undergraduate courses in inequality and discrimination, statistics and econometrics. I teach doctoral seminars in labor economics and local public finance. I am the only current member of my Department to have won the Department's annual teaching award more than once.

My published articles in peer-reviewed professional journals include many that address issues of discrimination and of minority representation. I am an associate editor of the China Economic Review and have served as a referee for over 50 journals in many different fields in the social sciences, as well as for the National Science Foundation. My professional biography is included in the Fourth Edition of Who's Who in Economics. My C.V. is attached as Appendix A.

I am paid \$300 per hour spent in the creation of this report and for any subsequent work requested by my client. This may include, but is not limited to, review of and responses to any additional disclosures by the Plaintiffs, their attorneys and their expert witnesses.

This report reviews "The effect of Proposition 200 on voter registration in Arizona", by Dr. Louis R. Lanier, the "Written Report of Dr. Rodolfo Espino with respect to the effects of Proposition 200 on Arizona's Hispanic population", the "Expert report of Dr. Jorge Chapa" and the "Preliminary report of Dr. Richard L. Engstrom". This review addresses the scientific validity of the techniques employed by these reports and the quality of the evidence that they present and the extent of support for the conclusions that they draw.

The opinions in this report are based on this review, on the expertise of the author and on the authorities cited in the References. These opinions are subject to change if further opinions

are disclosed by the authors of the reviewed reports. Moreover, these authors have failed to fully disclose their methods and data. The opinions stated herein will also be subject to change in the event of further disclosures.

### **I. Review of “The effect of Proposition 200 on voter registration in Arizona”, by Dr. Louis R. Lanier**

Dr. Lanier’s report attempts to assess the effects of Proposition 200 on Hispanic and non-Hispanic voter registrations. It makes four claims (paragraph 7, pg. 3):

1. “The implementation of Prop 200 in January 2005 is correlated with a fall in both Hispanic and non-Hispanic voter registrations”,
2. “The fall in Hispanic voter registrations was more severe than the fall in non-Hispanic voter registrations”,
3. “Neither Hispanic nor non-Hispanic voter registrations have recovered to levels that would have been predicted, given pre-Prop 200 trends”, and
4. “Hispanic voter registrations remain further below predicted levels than non-Hispanic voter registrations in the time since Prop 200 was implemented”.

The validity of these claims cannot be fully assessed because Dr. Lanier has not fully disclosed the data and methods which he used to form his opinions.

These opinions are also based on Dr. Lanier's assumption (paragraph 8, pg. 3) “that relative trends in Hispanic and non-Hispanic voting-age populations were the same after the implementation of Prop 200 as they were immediately prior to its implementation.” No evidence is offered in support of this assumption. Moreover, this assumption is inappropriate. Any analysis of voter registration should be based on the populations of voting-age Arizonans who are eligible to vote.

Lastly, these opinions are based on Hispanic identifications using the Passel-Word Spanish Surname list. Perkins (1993) describes a validation study in which 10.85% Arizona residents identified as Hispanics by this list did not, in fact, claim Hispanic identity. Of Arizona residents claiming Hispanic identity, 22.50% were not identified by this list. Errors would be somewhat more frequent in Dr. Lanier's data because the list is somewhat more successful at identifying children than adults.<sup>1</sup> As a consequence of these errors, Dr. Lanier's statistical analyses are less accurate than they appear to be.

In addition to these general reservations, Dr. Lanier's work fails to support his conclusions. Appropriate comparisons demonstrate that Hispanic registrations did not decline after the implementation of Proposition 200. The results of Dr. Lanier's regression analysis are almost certainly the consequence of misspecified equations rather than accurate representations of registration experience. Lastly, Dr. Lanier's claims of statistical significance are almost certainly unfounded.

**A. No evidence that Hispanic registrations declined**

Charts 1 and 2 of Dr. Lanier's report present, respectively, Dr. Lanier's estimates of Hispanic and non-Hispanic voter registrations in Arizona during the period beginning with January 2000 and ending in July 2007. These charts contradict his first two claims. This is immediately apparent in the comparison between the period subsequent to the implementation of Proposition 200 and the same part of the Presidential election cycle in the period preceding its implementation.

The period subsequent to the implementation of Proposition 200 examined by Dr. Lanier

---

<sup>1</sup> The list is also more successful at identifying men than women.

begins in January 2005, approximately two months after the preceding Presidential election in November 2004. It continues for two years and seven months, to July 2007. It does not contain a Presidential election, nor the approximately 16 months that would precede a Presidential election.

The period prior to the implementation of Proposition 200 contains two Presidential elections. It also includes approximately eleven months prior to the Presidential election of November 2000, and sixteen months prior to the Presidential election of November 2004. As Dr. Lanier's charts 1 and 2 demonstrate, registration behavior exhibits peaks during the periods preceding Presidential elections which are well in excess of any registration levels during other periods. Therefore, these periods are not comparable to the period subsequent to the implementation of Proposition 200.

Instead, the comparable period prior to the implementation of Proposition 200 begins in January 2001, again approximately two months after the preceding Presidential election in November 2000. It ends two years and seven months later, in July 2003.

Chart 1 of this report compares Hispanic Arizona voter registrations during only this period to the comparable period subsequent to the implementation of Proposition 200. It reproduces Dr. Lanier's Chart 1, but deletes the two Presidential election cycles of January through November 2000 and August 2003 through November 2004. It is obvious that the number of Hispanic registrations throughout the period subsequent to the implementation of Proposition 200 exceeded the number of Hispanic registrations at the equivalent points in the period prior to the implementation of Proposition 200.

Chart 1: Chart 1 from Dr. Lanier's report, modified

Chart 1  
Hispanic Arizona Voter Registrations  
Actual and Predicted Registrations Following Prop 200

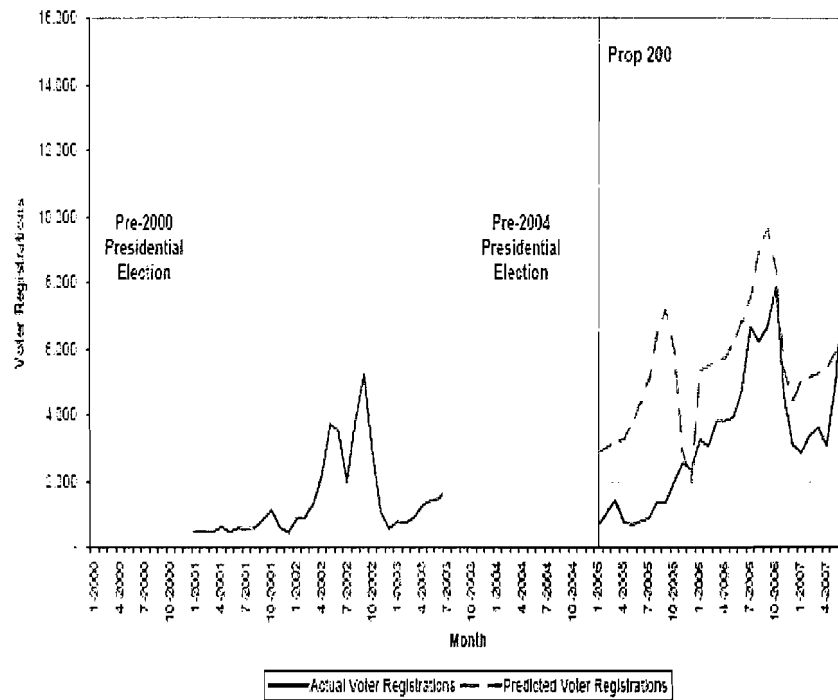


Chart 2 of this report makes the same comparison for non-Hispanic Arizona voter registrations. It reproduces Dr. Lanier's Chart 2, but again deletes the two Presidential election cycles of January through November 2000 and August 2003 through November 2004. As with chart 1, the number of non-Hispanic registrations throughout the period subsequent to the implementation of Proposition 200 exceeded the number of non-Hispanic registrations at the equivalent points in the period prior to the implementation of Proposition 200.

Chart 2: Chart 2 from Dr. Lanier's report, modified

Chart 2  
Non-Hispanic Arizona Voter Registrations  
Actual and Predicted Registrations Following Prop 200

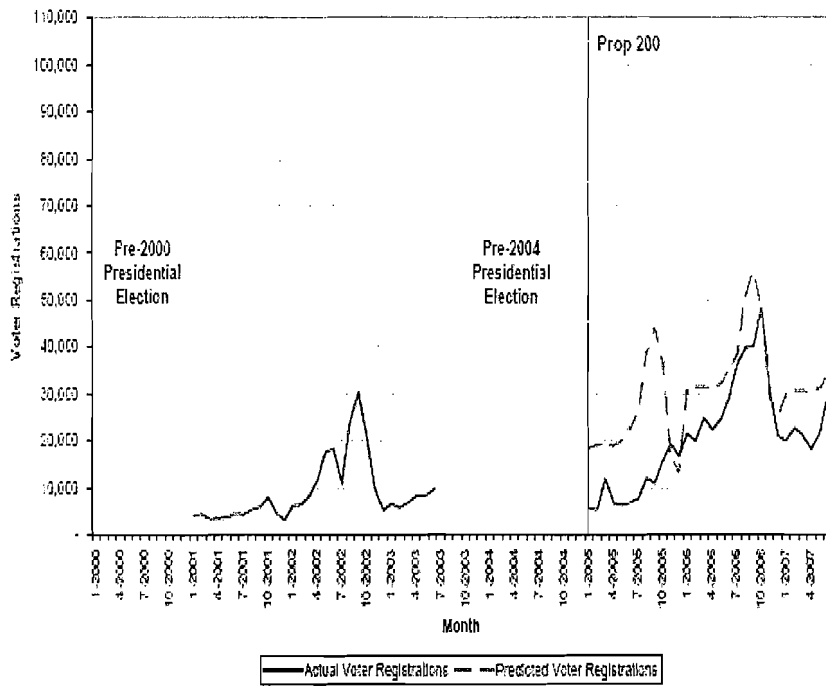


Chart 1 demonstrates conclusively that Hispanic registrations in period subsequent to the implementation of Proposition 200 were greater than they were in the equivalent period prior to its implementation. Chart 2 presents the same demonstration for non-Hispanic registrations. Consequently, Dr. Lanier's data contradict his first claim.

Dr. Lanier's data also demonstrate that the increases in registrations by Hispanics and non-Hispanics are of very similar magnitude. For example, new Hispanic registrations in the period subsequent to the implementation of Proposition 200 peaked in approximately September 2006, at approximately 8,000. The parallel peak in the comparable period prior to the implementation of Proposition 200 occurred in approximately September 2002, at approximately 5,000 Hispanic registrations. The later peak recorded approximately 60% more registrations than did the earlier peak.

September 2006 also saw the post-Proposition 200 peak in non-Hispanic registrations, at approximately 48,000. In the equivalent pre-Proposition 200 peak of September 2002, non-Hispanic registrations were approximately 30,000. As with Hispanic registrations, the peak number of monthly non-Hispanic registrations subsequent to the implementation of Proposition 200 was approximately 60% greater than the number of non-Hispanic registrations in the equivalent pre-Proposition 200 month.

Moreover, there appears to be a second post-Proposition 200 peak in Hispanic registrations of nearly 8,000 in July 2007. This appears to be more than four times the number of Hispanic registrations in the corresponding pre-Proposition 200 month, July 2003. In contrast, non-Hispanic registrations in July 2007 were only three times as large as non-Hispanic registrations in July 2003. By this measure, Hispanic registrations not only grew, but grew more

quickly subsequent to the implementation of Proposition 200 than did registrations of non-Hispanics.<sup>2</sup>

Consequently, Dr. Lanier's data contradict his second claim. The increase in Hispanic registrations after the implementation of Proposition 200 appears to be at least as large, and, if anything, larger than the contemporaneous increase in non-Hispanic registrations

### **B. Misspecified regressions**

Dr. Lanier supports his first and second claims with the three regression analyses which appear in the 17th through 25th pages of his report, the first six pages of his Appendix B. These regression analyses indicate that registrations declined, with acceptable statistical significance, in the period subsequent to the implementation of Proposition 200.

As demonstrated above, actual registrations in the period subsequent to the implementation of Proposition 200 exceed those for the equivalent period prior to its implementation. Nevertheless, Dr. Lanier's regressions indicate that registrations were lower in post-Proposition 200 period than in the entire pre-Proposition 200 period. This suggests that Dr. Lanier's regressions rely improperly on the higher levels of pre-Proposition 200 registrations that occurred during the two Presidential elections cycles of that period. This suggestion is confirmed by the specification of Dr. Lanier's regressions, as revealed in Appendix B of his report.

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<sup>2</sup> Dr. Lanier (paragraph 18, page 7) appears to dismiss the high number of Hispanic registrations in May through July 2007 as an “outlier”, the consequence of a voter registration drive. However, Dr. Lanier's only source for this claim is the plaintiffs' attorneys. Moreover, Dr. Lanier does not discuss whether this voter registration drive was unusual, or whether voter registration drives aimed at either Hispanics or non-Hispanics occurred at other times in the period he examines. Therefore, there is no evidence that registration behavior during these last three months was categorically different from that during the rest of the period under study.

Dr. Lanier's regression analyses are based on data which estimate the numbers of Hispanic and non-Hispanic registrations in each Arizona county, in each month of the years 2000 through 2006 and in January through July of 2007.<sup>3</sup>

As Dr. Lanier explains on page 5 of his report, his regressions include 15 binary “dummy” variables, one for each county. These binary variables represent the possibility that average registrations levels vary from county to county.

These binary variables are labeled “COUNTY\_ID 1” through “COUNTY\_ID 15” in the regressions of Dr. Lanier's Appendix B. For technical reasons, only 14 of these variables are necessary. The regressions in Dr. Lanier's Appendix B ignore the binary variable for the fifteenth county, “COUNTY\_ID 15”.

Dr. Lanier also includes a binary variable for each month to represent the possibility that average registrations levels vary from month to month. These twelve variables are labeled “month 1” through “month 12” in the regressions of Dr. Lanier's Appendix B. As with the binary variables for counties, only 11 of the binary variables for months are necessary. The regressions in Dr. Lanier's Appendix B ignore the binary variable for the twelfth month, “month 12”.

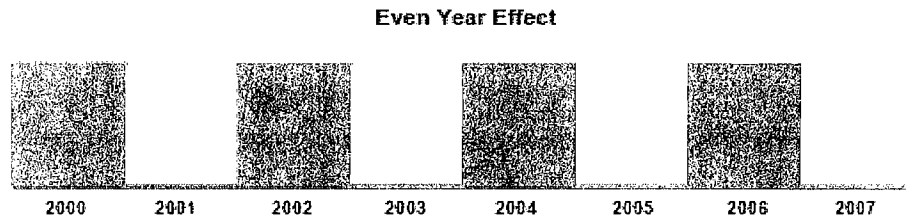
Similarly, Dr. Lanier's regressions should include one binary variable for each year to represent the possibility that average registration levels vary from year to year. This would amount to eight binary variables, of which seven would be necessary.

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<sup>3</sup> Dr. Lanier's first regression combines Hispanic and non-Hispanic registrations. It is based on 1,348 observations, each representing one county in one month. However, his second regression, analyzing Hispanic registrations only, is based on only 1,302 observations. His third regression, analyzing non-Hispanic registrations only, is based on 1,346 observations. Dr. Lanier offers no explanations for these discrepancies. They raise the possibility that he has made errors in the construction of his data. Any such errors might further invalidate his analyses. The presence or extent of these errors cannot be ascertained until Dr. Lanier completes his disclosure.

However, Dr. Lanier's regressions do not include these binary variables. Instead, they characterize the variations in average registrations from year to year with only four variables.

**Figure 1: Effect of binary variable for even years**



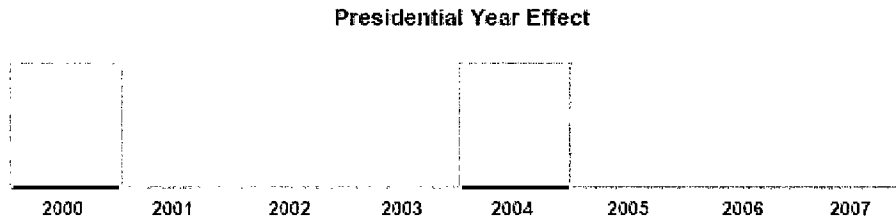
The first of these four variables is a binary variable which distinguishes average registration levels in even years from those in odd years. As Dr. Lanier states on page 5 of his report, this variable is intended to represent increases in registrations associated with elections which occur during even-numbered years.<sup>4</sup> It implies that these increases are the same in all

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<sup>4</sup> On page 5 of his report, Dr. Lanier refers to “a set of even-year dummy variables”, implying that he intended to use more than one. However, it is evident in Appendix B of his report that he actually used only one binary variable to represent elections held in even years. Presumably, this single variable applied to all observations from 2000, 2002, 2004 and 2006.

even-numbered years. Figure 1 displays its effect on registration levels in the eight years examined by Dr. Lanier.

**Figure 2: Effect of binary variable for Presidential election years**



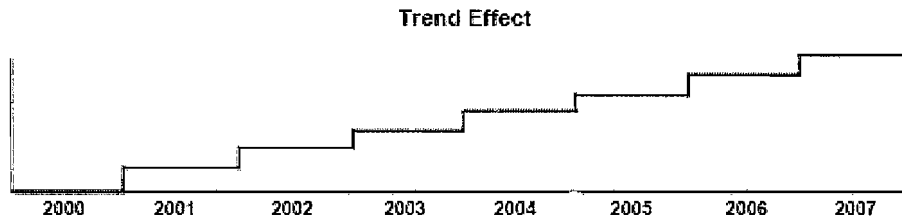
The second of these four variables is a binary variable which represents the increases in average registration levels that occur in years with Presidential elections. This variable implies that these increases are the same in all Presidential years.<sup>5</sup> Figure 2 displays its effect on registration levels.

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However, this cannot be verified until Dr. Lanier completes his disclosures.

<sup>5</sup> On page 5 of his report, Dr. Lanier refers to “a set of presidential election year dummy variables”, implying that he intended to estimate separate registration increases for the 2000 and

**Figure 3: Effect of trend**

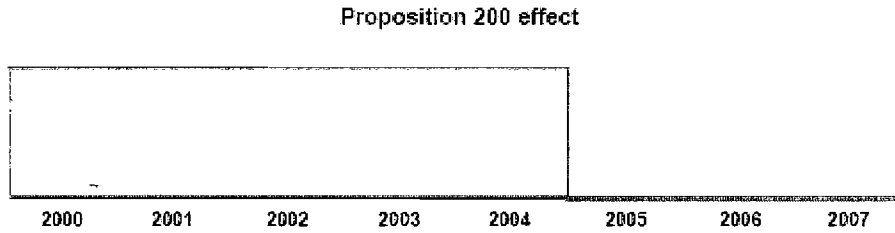


The third of these four variables is a “time trend to account for the general trend in voter registrations” (Dr. Lanier's report, page 5). This variable implies that, apart from other effects, registrations increase from year to year by the same number. Figure 3 displays its effect on registration levels.

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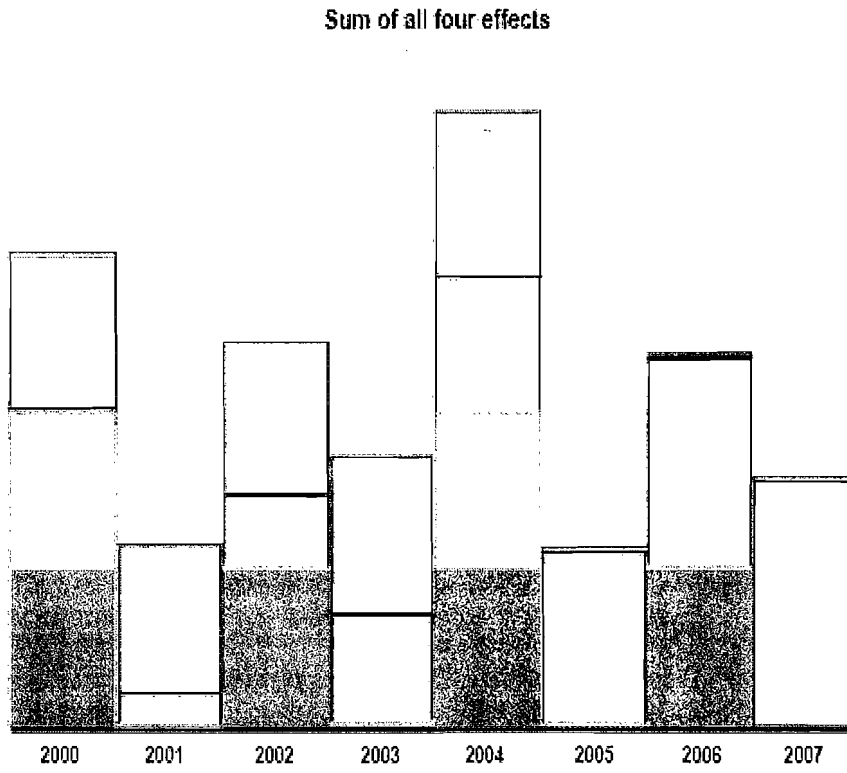
2004 Presidential elections. However, it is evident in Appendix B of his report that he actually used only one binary variable for Presidential elections. Presumably, this variable applied to both the 2000 and 2004 elections. However, this cannot be verified until Dr. Lanier completes his disclosures.

**Figure 4: Effect of binary variable for post-Proposition 200 years**



The fourth of these four variables is a binary variable which distinguishes the years subsequent to the implementation of Proposition 200 from those prior. In Dr. Lanier's regression, this variable indicates that, all else equal, pre-Proposition 200 registrations were higher than post-Proposition 200 registrations by the same amount in each post-Proposition 200 year. Figure 4 displays the effect of this variable on registration levels.

**Figure 5: Sum of effects for even years, Presidential years, trend and post-Proposition 200 years**



The sum of these four effects is the representation in Dr. Lanier's regression of the variations in registration levels that occurred across the eight years of his data. This sum yields the general pattern which is illustrated in figure 5.

Dr. Lanier's regression specification forces the regression to yield estimates of yearly variations in registrations which conform to this general pattern. If actual registrations followed any other yearly pattern, Dr. Lanier's regressions could reproduce the actual patterns only by assigning distorted effects to the four variables represented in figures 1 through 4.

It is evident in figure 5 that the use of only four variables to characterize year to year variations in registrations, rather than the seven which would be appropriate, artificially restricts the ability of Dr. Lanier's regressions to reproduce the registration patterns that might actually appear in the Arizona registration record. It is likely that the negative regression effect which Dr. Lanier reports for the period subsequent to the implementation of Proposition 200 is the consequence of this restriction, rather than an accurate estimate of the change in registrations from before to after implementation.

In more formal terms, Dr. Lanier's regressions omit the seven binary variables which would identify the distinct registration effects of each year. These regressions replace them with the four variables described in figures 1 through 4. As is well-known, the omission of important variables causes the estimated effects of the variables that remain in the regression to be biased, if the included variables are correlated with those omitted.<sup>6</sup>

The four variables portrayed in figures 1 through 4 are almost certainly correlated with

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<sup>6</sup> For an example of a discussion of this issue in an introductory econometrics text, see Gujarati (2003, page 510).

the omitted binary variables for each year. Consequently, the bias arising from the omission of these variables obscures the true effect of the implementation of Proposition 200.

This would explain the inconsistency between this regression effect and the compelling evidence in charts 1 and 2 above that Hispanic and non-Hispanic registrations were actually higher post-Proposition 200 than they were in the comparable months pre-Proposition 200.

Dr. Lanier's third and fourth claims refer to predictions derived from the remaining regression analyses in his Appendix B, in the 26th through 31st pages of his report. These regressions analyze registration patterns prior to the implementation of Proposition 200.

Charts 1 and 2 of Dr. Lanier's report each contain a green dashed line in the period subsequent to the implementation of Proposition 200. These lines represent his predictions of registrations. In each of Dr. Lanier's charts, the line representing his predictions lies almost entirely above the line representing actual registrations. In other words, he predicts that post-Proposition 200 registrations will be greater than actual post-Proposition 200 registrations.

Charts 1 and 2 of this report reproduce these green dashed lines. It is evident in these charts that the predictions represented by these lines are not related to the actual experience of Hispanic and non-Hispanic registrations in the period prior to the implementation of Proposition 200 which is comparable to the period subsequent to its implementation. Nothing in the experience of that earlier period is consistent with the exaggerated registration increases embodied in Dr. Lanier's predictions.

This suggests that Dr. Lanier's predictions rely improperly on the higher levels of pre-Proposition 200 registrations that occurred during the two Presidential elections cycles of that period, even though these cycles have no comparable periods post-Proposition 200. The

regressions which yield Dr. Lanier's predictions confirm this suggestion. They are misspecified in the same way as are those which estimate the effect of Proposition 200 on registrations. This misspecification almost certainly inflates Dr. Lanier's predictions improperly.

These regressions are based on registration data in five years, 2000 through 2004. As discussed above, these regressions, if properly specified, would include a binary variable for each of the five years, one of which would be ignored. Instead, they characterize the variations in registrations which occur from year to year using only three variables. These three variables represent the effect of even years on registrations, portrayed in figure 1 above, the effect of years with Presidential elections on registrations, portrayed in figure 2 above, and the effect of the time trend, portrayed in figure 3 above.

As discussed above, the omission of the appropriate variables and the substitution of a smaller number of inappropriate variables almost certainly causes the estimated effects of the included variables to be distorted. The distortions in these estimated effects almost certainly yield the distortions which are so clearly present in Dr. Lanier's predictions of charts 1 and 2. As these charts demonstrate, predictions of post-Proposition 200 registrations properly based on the comparable pre-Proposition 200 period would almost certainly not exceed actual registrations in the post-Proposition 200 period.

### **C. Incorrect tests of statistical significance**

Dr. Lanier's second and fourth claims also rely on his assertions that the relevant differences are statistically significant. In footnote 4 of his report, Dr. Lanier properly emphasizes the paramount importance of statistical significance in ascertaining the reliability of conclusions

drawn from statistical analysis. However, his own calculations of statistical significance are insufficiently documented and almost certainly incorrect.

Dr. Lanier asserts (paragraph 14, pages 5-6) that “(t)he 18.5 percent difference between the Hispanic and non-Hispanic experiences is statistically significant at 5.1 standard deviations.” He does not identify the “standard deviation” in question, nor explain its derivation. However, he could not have calculated the correct standard deviation from the information that appears to be available.

As explained in Dr. Lanier's footnote 3, the difference of 18.5% is based on the different effects of Proposition 200 that his regressions estimate for registration levels among Hispanics and non-Hispanics. His regressions estimate that monthly registrations among Hispanics were reduced by 164 in the post-Proposition 200 era (page 21 of Dr. Lanier's report). His regressions estimate that monthly registrations among non-Hispanics were reduced by 773 in the post-Proposition 200 era (page 24 of Dr. Lanier's report). The difference between these two estimates, 609, estimates the difference between the decline in registrations among non-Hispanics and the decline in registrations among Hispanics.

The standard deviation of this difference is required in order to calculate the statistical significance of this difference. This standard deviation depends on the covariance of the estimated declines in Hispanic and non-Hispanic registrations.<sup>7</sup> However, the estimated declines in Hispanic and non-Hispanic registrations are drawn from two different regressions. The only way to obtain the necessary covariance is to estimate these two regressions simultaneously, in a

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<sup>7</sup> For a more complete exposition of these issues in an introductory econometrics text, see, for example, Gujarati (2003, pages 264-265).

single procedure.<sup>8</sup>

Dr. Lanier obtains his regression estimates from the GLM procedure of the statistical software package SAS, as is evident from the computer outputs reproduced in his Appendix B. This procedure is not capable of estimating two regressions simultaneously.<sup>9</sup>

Consequently, Dr. Lanier could not have estimated the covariance between the estimated declines in Hispanic and non-Hispanic registrations. Without this essential element, the statistical significance of the difference between these declines cannot be calculated. Therefore, any claims that Dr. Lanier might have made regarding the significance of this difference would have been unfounded.

Dr. Lanier compounds this problem by focusing not on the difference between the absolute declines in Hispanic and non-Hispanic registrations, but on the difference between the estimated percentage declines in voter registration. As Dr. Lanier explains in his footnote 3, the estimated percentage decline in Hispanic registrations is the ratio of the reduction in Hispanic registrations, 164, to the average of estimated monthly Hispanic registrations, 205.

Any calculation of statistical significance involving this ratio requires the variance of this ratio. Smith (1969, page 29) asserts that the “(d)istribution of ratio estimates [is] the most intractable part of sample survey theory”. Smith (1969) and Koop (1972) are discussions of the

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<sup>8</sup> Statistical inference in simultaneous equation models is a sophisticated subject, not covered by introductory texts such as Gujarati (2003). For a discussion in an advanced text, see Ruud (2000, pages 727-730).

<sup>9</sup> This is explicit in the documentation for this procedure. See the SAS OnlineDoc 9.1.3. at <http://support.sas.com/onlinedoc/913/docMainpage.jsp>, click on “SAS Procedures”, click on “G” in the alphabetical options, click on “GLM”, click on “Syntax” and click on “MODEL”. The documentation there states that “(y)ou can specify only one MODEL statement”.

difficulties encountered in deriving the variance of a ratio. There is no evidence in Dr. Lanier's report that he is aware of these difficulties, much less that he has surmounted them.

Consequently, it must be assumed that Dr. Lanier has not correctly calculated the variance of his estimated percentage reduction in Hispanic registrations. The same must be true of the variance of the percentage decline in non-Hispanic registration and of the covariance between these ratios. Therefore, his claims regarding the statistical significance of the difference between these estimated percentage reductions are simply not credible.

Dr. Lanier makes two further claims of statistical significance, in paragraphs 17 and 19, page 7, of his report. These claims are even more problematic than that of his paragraph 14, pages 5-6. They suffer from all of the problems discussed with regard to the first claim. In addition, these claims are in regard to differences in predicted outcomes rather than in estimated effects. The calculation of statistical significance for predicted outcomes is even more difficult than that for estimated effects.<sup>10</sup>

Once again, Dr. Lanier's report offers no hint that the difficulties are understood, much less addressed. Moreover, he claims levels of statistical significance which would be implausible in this context.<sup>11</sup> Therefore, these claims of statistical significance are also almost certainly incorrect.

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<sup>10</sup> For a more complete exposition of these issues in an introductory econometrics text, see, for example, Gujarati (2003, pages 940-947).

<sup>11</sup> In paragraph 17, Page 7, Dr. Lanier claims that "This six percent difference is statistically significant at 47.9 standard deviations." In paragraph 19, Page 7, Dr. Lanier claims that "This 8.5 percent difference between Hispanics and non-Hispanics is statistically significant at 64.1 standard deviations." As with the claim of statistical significance in paragraph 14, pages 5-6, Dr. Lanier does not identify the standard deviations to which he refers, nor does he provide details of the calculations by which they were computed.

## **II. Review of “Written Report of Dr. Rodolfo Espino with respect to the effects of Proposition 200 on Arizona’s Hispanic population”**

Dr. Espino's report examines the proportion of new voter registrants in Arizona who were Hispanic over the period from 4 June 2002 to 31 July 2007. He concludes that the racial composition of registrants varies over this period (pg. 2). He also concludes that the shares of Hispanics among registrants in Greenlee County and in Yuma County were lower at the end of this period than at the beginning (pg. 6). Lastly, he intimates, but does not conclude, that the effects of registration requirements in Proposition 200 were not neutral with respect to the proportion of registrants who were Hispanic.

Dr. Espino's evidence cannot be verified because he has not fully disclosed the data and methods by which he constructed them. However, his conclusions are suspect, regardless. They are based on improper comparisons between noncomparable time periods and have no statistical support.

### **A. Noncomparable time periods**

The period examined by Dr. Espino encompasses 941 days prior to, and 941 days subsequent to the implementation of Proposition 200 on 1 January 2005. However, as discussed in the review of Dr. Lanier's report, a Presidential election occurred in early November of 2004. Therefore, the pre-Proposition 200 period studied by Dr. Espino includes this election and the approximately two years and five months which preceded it. The post-Proposition 200 period studied by Dr. Espino consists of the approximately two years and seven months which followed this election, with a two month lag.

Therefore, Dr. Espino's pre- and post-Proposition 200 periods encompass opposite ends of the Presidential electoral cycle. As discussed in the review of Dr. Lanier's report, registration behavior varies systematically through this cycle. Therefore, Dr. Espino's comparisons of registration behavior in his pre- and post-Proposition 200 periods confound any differences in this behavior which might have been induced by Prop 200 with the palpable differences in this behavior associated with different points in the Presidential electoral cycle.

**Chart 3: Figure 1 from Dr. Espino's report, modified**

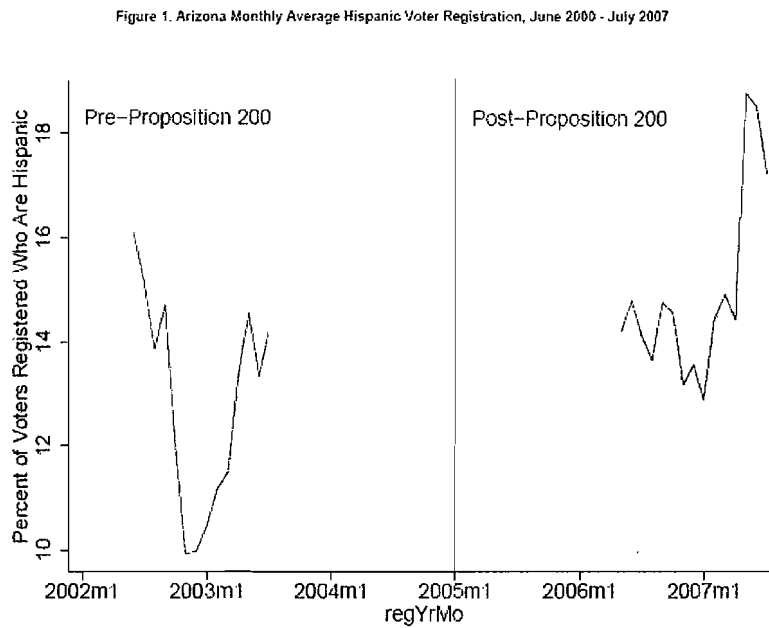


Chart 3 demonstrates the consequences of this mismatch in electoral cycles for Dr. Espino's analysis. It reproduces figure 1 from his report, with modifications to ensure that comparisons before and after the implementation of Proposition 200 are valid.

Dr. Espino's post-Proposition 200 period ends 17 months before 1 January, 2009. Therefore, the 17 months of his pre-Proposition 200 period prior to 1 January, 2005, have no comparable period after the implementation of Proposition 200. Chart 3 deletes them.

Similarly, Dr. Espino's pre-Proposition 200 period begins 17 months after 1 January 2001. Consequently, the first 17 months of his post-Proposition 200 period, starting with 1 January 2005, have no comparable period prior to the implementation of Proposition 200. Chart 3 deletes them as well.

Consequently, the two periods which remain in Chart 3 both begin approximately nineteen months after the preceding Presidential election, and both end approximately fifteen months before the next Presidential election. The pre-Proposition 200 period runs from approximately June 2002 through approximately July 2003. The post-Proposition 200 period runs from approximately June 2006 through approximately July 2007.

In chart 3, it is evident that the average proportion of Hispanics among registrants was markedly higher in the post-Proposition 200 period than in the comparable period prior to the implementation of this Proposition. This proportion never fell below 13% in the later period, was typically between 14% and 15%, and peaked toward the end of the period above 18%.

In contrast, the proportion of Hispanics among registrants in the comparable pre-Proposition 200 period was almost always below 14%. It was above this threshold at the beginning of the period and returned to it at the end. However, during the middle of this period it

dropped to only 10%.

This contrast is not as readily apparent in figure 1 of Dr. Espino's report. The principal reason is that this figure improperly includes the Presidential election of 2004 in the pre-Proposition 200 comparison period and the post-election period in the post-Proposition 200 comparison period. The share of Hispanics among all registrants peaked strongly just prior to this election, and then fell substantially in its aftermath. This may suggest that Hispanics simply accelerated their registrations in advance of this Presidential election, perhaps because it was of heightened interest.

Regardless, there is nothing in figure 1 of Dr. Espino's report to suggest that the Hispanic proportion of registrants fell after the implementation of Proposition 200. To the contrary, comparisons across comparable pre- and post-Proposition 200 periods, as in the corrected figure 1 given in chart 3 above, indicate that this proportion increased, instead.

Figure 3 of Dr. Espino's report provides the same information as in figure 1, but for each of the fifteen counties in Arizona instead of for the State as a whole. On the basis of this figure, Dr. Espino, draws the conclusion that the proportions of Hispanics among registrants fell over the period he examines in Greenlee and Yuma Counties. As in figure 1 of Dr. Espino's report, the comparisons in his figure 3 are contaminated by the inclusion of periods in each of the pre- and post-Proposition 200 periods which have no comparable period in the other.

The adjustment made to Dr. Espino's figure 1 in chart 3 above, applied to the chart for Greenlee County in Dr. Espino's figure 3, would delete the periods of relatively high Hispanic registration in the beginning and end of the pre-Proposition 200 period, and the period of relatively low Hispanic registration at the beginning of the post-Proposition 200 period. The

remaining pre- and post-Proposition 200 periods, representing comparable portions of the Presidential election cycle, would very likely show no decline in the proportion of Hispanics among registrants. The same adjustment would probably yield the same conclusion for Yuma County.

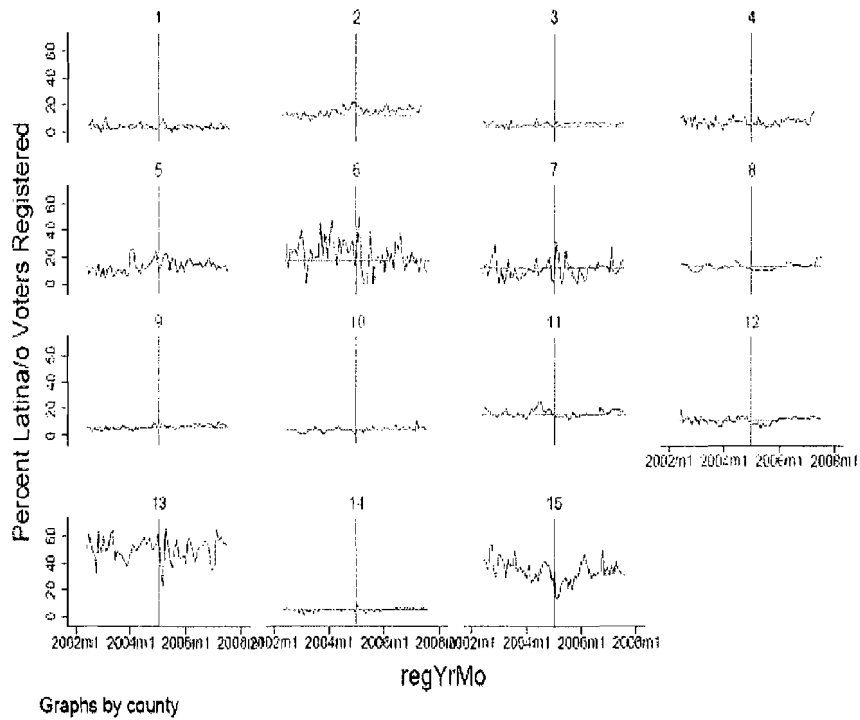
**B. Absence of statistical support**

Apart from the distortions arising from comparisons among non-comparable periods, Dr. Espino's conclusions do not have any statistical foundation. For example, he makes no effort to determine if the fluctuations from month to month in the proportion of registrants who are Hispanic are large enough to be statistically significant, either for the State as a whole or for any of the individual Counties.

Dr. Espino's conclusions regarding the alleged decline in the Hispanic proportion of registrants in Greenlee and Yuma Counties are based only on casual inspection of his figure 3. These conclusions could be tested rigorously by simple regression analysis, applied to the data for each county represented in figure 3. This would demonstrate whether the tendencies in Hispanic shares of registrants over time in any of these counties were towards decline, constancy or increase. Dr. Espino's failure to provide a demonstration such as this further undermines the credibility of his claims.

### Chart 4: Figure 3 from Dr. Espino's report, modified

Figure 3. Arizona Monthly Average Hispanic Voter Registration, June 2000 - July 2007, by County on Same Scale



These regressions cannot be performed here because Dr. Espino has not fully disclosed his data and methods. Instead, chart 4 presents an informal attempt to anticipate the results of such regressions. This attempt ignores the problem of comparing noncomparable parts of the Presidential election cycle pre- and post-Proposition 200, in an attempt to simulate the results that Dr. Espino might have obtained, had he offered statistical evidence rather than casual impressions.

As Dr. Espino writes (pg. 5): “If the threshold to registering to vote is experienced equally by all individuals irrespective of race or ethnicity, then we should see straight lines across these monthly average plots.” Chart 4 overlays straight lines on each of these plots. These lines provide a reference point against which to visually assess the general trend in the proportion of registrants who are Hispanic within each county.

For example, the horizontal lines for Counties 1 (Apache), 3 (Coconino), 8 (Maricopa), 9 (Mohave), 10 (Navajo) and 11 (Pima) seem to coincide very closely with the pattern of estimated variations in the percentages of Hispanics among registrants. The patterns in counties 4 (Gila), 7 (La Paz), 12 (Pinal), 13 (Santa Cruz) and 14 (Yavapai) show more volatility, but their general adherence to the horizontal line suggests that this volatility would not be statistically significant. The pattern in County 15 (Yuma) suggests first a decline and then an increase in the percentage of Hispanics among registrants, but overall would probably be again summarized by a horizontal regression line. These comparisons indicate that, in these twelve counties, the percentages of Hispanics were effectively constant over the period studied.

In contrast, the percentages of Hispanics among registrants appear to trend slightly up, relative to the horizontal line, in Counties 2 (Cochise) and 5 (Graham). Only in County 6

(Greenlee), is there any suggestion that this percentage was consistently above the horizontal line in the pre-Proposition 200 period and below it in the post-Proposition 200 period.

In sum, even ignoring the impropriety of comparing the entire pre- and post-Proposition 200 periods examined in Dr. Espino's work, his own data suggest that there were essentially no meaningful trends in the proportion of Hispanics among registrants in twelve of Arizona's fifteen counties. There may have been a downward trend in one of the remaining three, but the trend in the other two was probably upward. Consequently, there is no support for the intimation that the Hispanic proportion of all registrants declined after the implementation of Proposition 200.

### **III. Review of “Expert report of Dr. Jorge Chapa”**

Dr. Chapa's report contains a number of tabulations regarding economic and demographic characteristics of the Hispanic and non-Hispanic populations in Arizona. On the basis of these tabulations, he concludes “that Arizona Hispanics show disproportionately lower levels of education, income and political participation when compared to non-Hispanics in Arizona. This is a clear indication of a legacy of discrimination that directly and indirectly has prevented their full participation in the electoral process.”

This conclusion is irresponsible. The Noble Laureate James Heckman (1998, page 101) states that “(d)isparity in market outcomes does not prove discrimination in the market.” To the contrary, responsible claims of discrimination require either direct evidence of discriminatory behavior or careful demonstrations that disparate outcomes do not have other explanations. Dr. Chapa provides neither.

These criteria have been recognized in the scientific literature since at least the 1957 publication of The Economics of Discrimination, by the Nobel Laureate Gary S. Becker.<sup>12</sup> They are routinely addressed in introductory textbooks such as Kimenyi (1995, chapter 9), Wolff (1997, part IV), Blau, Ferber and Winkler (2002, chapter 7), Hoffman and Averett (2005, chapters 8, 9 and 10), Jacobsen (2007, chapter 9) and Schiller (2008, chapters 11 and 12). Cahuc and Zylberberg (2004, 280-295) discuss them in the context of an advanced textbook. Cain (1986) and Altonji and Blank (1999) provide authoritative reviews of the literature and, more importantly, the methodology. There can be no scholarly excuse for ignoring this well-established scientific tradition.

Cain (1991, page 115) concludes “that evidence based on statistical analysis is necessary but not sufficient for establishing the presence of economic discrimination. It must be supported by historical and institutional evidence and interpreted within a theoretical framework.” Dr. Chapa has singularly failed to provide this support. Therefore, his conclusion is not credible.

#### **IV. Review of “Preliminary report of Dr. Richard L. Engstrom”**

Dr. Engstrom purports to analyze the voting preferences of Latino and non-Latino voters in seven electoral contests held in Arizona. He concludes that (paragraph 11, page 6) “(t)he results of the analyses of these elections indicate that voting has been racially polarized.”

Dr. Engstrom's evidence cannot be verified because he has not fully disclosed the data

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<sup>12</sup> See the second edition of this monograph, Becker (1971).

that he uses, methods by which he constructed them or the details of his analysis. However, his conclusions are suspect, regardless. They are not supported by his own results, which he himself does not seem to trust. Moreover, he has misrepresented the legal status of the methodology which he appears to have chosen and has ignored overwhelming scientific evidence demonstrating that this methodology is invalid.

Paragraph 9, page 5 of Dr. Engstrom's report contains a lengthy list of problems with the data that he analyzes. Without further evidence, these problems are of sufficient magnitude as to cast substantial doubt on the credibility of his analysis.

Disregarding this issue, Dr. Engstrom's results indicate that Latino and non-Latino voters cast majorities for the same candidate in three of his seven contests, those for U.S. House District 4 and U.S. House District 6 in the General Election of 2006, and that for U.S. House District 4 in the General Election of 2004. No conclusion is possible for the U.S. House District 2 contest in the General Election of 2004 because Dr. Engstrom presents no evidence regarding the voting preferences of Latino voters. Therefore, at best, Dr. Engstrom has three elections in which Latino and non-Latino voters agreed, and three in which they did not.

The Random House Dictionary of the English Language, Unabridged Edition (1966), defines "polarization" as "the production or acquisition of polarity". It defines "polarity" as "the presence or manifestation of two opposite or contrasting principles or tendencies". It defines "opposite" as "contrary or radically different in some respect common to both". It defines "contrasting" as "opposite in nature or character; diametrically or mutually opposed". In other words, "polarization" requires a substantial degree of opposition.

These definitions are consistent with the Supreme Court's usages of these terms in its

decision in *Thornburg v. Gingles*. For example, the evidence that the Supreme Court relied upon in overturning several multi-member legislative districts demonstrated very high levels of cohesion among blacks and whites, for opposing candidates:

“Finding of political cohesiveness of black voters and existence of a white voting bloc, supporting claims that use of multimember districts impermissibly diluted black voting strength in violation of section 2, was supported by evidence of black support for black candidates in excess of 70% in both primary and general elections, that an average of 81.7% of white voters would not vote for any black candidate in the primary elections, and that two-thirds of the white voters would not vote for a black candidate even after he won the Democratic primary.” (*Thornburg v. Gingles*, 2754, numbered paragraph 15).

The Court interpreted these results as indicating

“that blacks **strongly** supported black candidates while, to the usual detriment of black candidates, whites **rarely** did support black candidates” (*Thornburg v. Gingles*, 2754, numbered paragraph 16, bolding emphasis added).

The Supreme Court concluded:

“*Finally*, the court considered the extent to which voting in the challenged districts was racially polarized. Based on statistical evidence presented by expert witnesses, supplemented to some degree by the testimony of lay witnesses, the court found that all of the challenged districts exhibit severe and persistent racially polarized voting.” (*Thornburg v. Gingles*, 2761).

In sum, the Supreme Court ruling that racial polarization was present in *Thornburg v. Gingles* was predicated on evidence which it took to indicate average levels of cohesion among blacks “in excess of 70%” and average levels of white bloc voting of 81.7% in primaries and at least two-thirds in general elections. It characterized blacks as “strongly” cohesive and whites as “rarely” voting for black-preferred candidates. Dr. Engstrom’s evidence, in which Latino and non-Latino voters agree in one-half of his contests, clearly does not reach this standard.

Moreover, among the three contests in which Dr. Engstrom would claim that the Latino and non-Latino voters disagreed, his estimates of voting preferences are impossible in two. He

estimates that -37.1% of all non-Latino voters voted for Richard Miranda for State Senate District 13, and that 120% of Latino voters voted for Earl Wilcox for State Senate District 14 in the Democratic Primary of 2004.

The results for these contests must certainly be suspect. Discarding them, and the contest for the U.S. House District 4 in the General Election of 2004, in which Dr. Engstrom estimates a Latino majority of 134.4% for Pastor, leaves Dr. Engstrom with only three contests in which he estimates voting preferences for both Latinos and non-Latinos that are not impossible. Latino and non-Latino voters cast majorities for the same candidate in two. This is hardly evidence of racial polarization. If anything, it is racial concord.

Dr. Engstrom claims (paragraph 7, pages 3-4) that his statistical procedure was “approved by the United States Supreme Court in [sic] for this purpose [analyzing possible instances of racial polarization] in *Thornburg v. Gingles*”. In fact, the Supreme Court decision in *Thornburg v. Gingles* contains no explicit endorsement and no discussion of the scientific merit of the techniques which produced the evidence that it reviewed in that case. It contains only the observation that “The District Court found both methods standard in the literature for the analysis of racially polarized voting.” (*Thornburg v. Gingles*, footnote 20).

Dr. Engstrom’s method of “ecological regression analysis” may have been “standard in the literature” in 1985. However, it is now understood to be scientifically invalid. Zax (2005) analyzes the properties of Dr. Engstrom’s method in contests with two racial groups and two candidates. This analysis proves that Dr. Engstrom’s estimates of cohesion have none of the statistical properties ordinarily required by scientific inquiry. It demonstrates further that, in up to 50% of simulations with no racial polarization, Dr. Engstrom’s method nevertheless claims

that it is present. In simulations with racial polarization, Dr. Engstrom's method regularly understates its extent.

To use the language of the Supreme Court decision in *Thornburg v. Gingles*, the method that is currently "standard in the literature for the analysis of racially polarized voting" is that presented by King (1997). Dr. Engstrom, in footnote 3 of his report, envisions further analyses in which he will employ this method. Until he does so, there is no credible evidence of racial polarization.

## **V. Summary**

The reports by Drs. Lanier, Espino, Chapa and Engstrom are distinguished by incomplete disclosure, casual analysis and unsupported conclusions. In addition, those by Drs. Chapa and Engstrom ignore well-established standards of scientific inquiry.

The most compelling interpretation of Dr. Lanier's results is that Hispanic registration levels were higher after the implementation of Proposition 200 than they were before. Dr. Espino's report demonstrates that the Hispanic proportion of voter registrations was at least as high in the post-Proposition 200 period as it was in the pre-Proposition 200 period, and possibly higher. Dr. Chapa identifies a number of disparities between the Hispanic and non-Hispanic populations, but no evidence of discriminatory origins. Lastly, Dr. Engstrom, to the extent that his results can be trusted, identifies two contests in which Latino and non-Latino voters cast majorities for the same candidate, and only one in which they disagree.

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Smith, H. Fairfield (1969) "Approximate formulae for bias and variance of ratios", The American Statistician, Vol. 23, No. 4, October, pages 29-31.

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Zax, Jeffrey S. (2005) "The statistical properties and empirical performance of double regression", Political Analysis, Vol. 13, No. 1, January, 57-76.

## **Appendix A: CV for Jeffrey S. Zax**

15 February 2008

**CURRICULUM VITAE**

**Jeffrey S. Zax**

University of Colorado at Boulder  
Dept. of Economics  
Campus Box 256  
Boulder, Colorado  
80309-0256  
(303) 492-8268  
FAX: (303) 492-8960  
e-mail: [zax@colorado.edu](mailto:zax@colorado.edu)  
website: <http://www.colorado.edu/Economics/Zax/>

1232 Detroit St.  
Denver, Colorado  
80206-3330  
(303) 399-0077  
FAX: (303) 399-6616

**Appointments**

Hunan University:

Adjunct Professor, December 2007 to present

Department of Economics, University of Colorado at Boulder:

Associate Chair, Undergraduate Program, August 2006 to present

Professor, August 1996 to present

Associate Professor, August 1990 through August 1996

Department of Economics, The Graduate School and University Center, City University of New York:

Associate Professor, September 1989 through August 1991

Assistant Professor, March 1985 through August 1989

Department of Economics, Queens College, City University of New York:

Associate Professor, September 1989 through August 1991

Assistant Professor, January 1984 through August 1989

Lecturer, September 1983 through January 1984

National Bureau of Economic Research:

Research Economist, September 1983 through August 1991

## Education

Ph.D. June, 1984 in Economics, Harvard University

B.A. June, 1976 Magna Cum Laude in Economics, Harvard University

## Papers in Refereed Journals

Zax, Jeffrey S. (2005) "The statistical properties and empirical performance of double regression", Political Analysis, Vol. 13, No. 1, January, 57-76.

Mocan, H. Naci, Erdal Tekin and Jeffrey S. Zax (2004) "Demand for medical care in urban China", World Development, Vol. 32, No. 2, February, 289-304.

Li, Haizheng and Jeffrey S. Zax (2003) "Labor supply in urban China", Journal of Comparative Economics, Vol. 31, No. 4, December, 795-817.

Rees, Daniel I., Jeffrey S. Zax and Joshua Herries (2003) "Interdependence in worker productivity", Journal of Applied Econometrics, Vol. 18, No. 5, September/October, 585-604.

Zax, Jeffrey S. (2003) "Residential location theory and the measurement of segregation", Annales d'Economie et de Statistique, Special issue on Discrimination and Unequal Outcomes, Nos. 71/72, July/December, 189-219.

Zax, Jeffrey S. and Daniel I. Rees (2002) "IQ, academic performance, environment and earnings", The Review of Economics and Statistics, Vol. 84, No. 4, November, 600-616.

Zax, Jeffrey S. (2002) "Comment on 'Estimating the extent of racially polarized voting in multicandidate contests' by Bernard Grofman and Michael Migalski", Sociological Methods & Research, Vol. 31, No. 1, August, 73-84.

Lynch, Jim and Jeffrey S. Zax (2000) "The rewards to running: Prize structure and performance in professional road racing", Journal of Sports Economics, Vol. 1, No. 4, November, 323-340.

Zax, Jeffrey S. (1997) "Latent demand for urban housing in the People's Republic of China", Journal of Urban Economics, Vol. 42, No. 3, November, 377-401.

Zax, Jeffrey S. and John F. Kain (1996) "Moving to the Suburbs: Do Relocating Companies Leave Their Black Employees Behind?", Journal of Labor Economics, Vol. 14, No. 3, July, 472-504.

Zax, Jeffrey S. and Mark S. Skidmore (1994) "Property Tax Rate Changes and the Rate of Development", Journal of Urban Economics, Vol. 36, No. 3, November, 314-332.

Zax, Jeffrey S. (1994) "When is a Move a Migration?", Regional Science and Urban Economics, Vol. 24, No. 3, June, 341-360.

Zax, Jeffrey S. (1991) "The Substitution Between Moves and Quits", The Economic Journal, Vol. 101, No. 409, November, 1510-1521.

Zax, Jeffrey S. (1991) "Compensation for Commutes in Labor and Housing Markets", Journal of Urban Economics, Vol. 30, No. 2, September, 192-207.

Ichniowski, Casey and Jeffrey S. Zax (1991) "Right to Work Laws, Free Riders and Unionization in the Local Public Sector", Journal of Labor Economics, Vol. 9, No. 3, July, 255-275.

Zax, Jeffrey S. and Casey Ichniowski (1991) "Excludability and the Effects of Free Riders: Right-to-Work Laws and Local Public Sector Unionization", Public Finance Quarterly, Vol. 19, No. 3, July, 293-315.

Zax, Jeffrey S. and John F. Kain (1991) "Commutes, Quits and Moves", Journal of Urban Economics, Vol. 29, No. 2, March, 153-165.

Zax, Jeffrey S. (1990) "Race and Commutes", Journal of Urban Economics, Vol. 28, No. 3, November, 336-348.

Zax, Jeffrey S. (1990) "Reform City Councils and Municipal Employees", Public Choice, Vol. 64, No. 2, February, 167-177.

Zax, Jeffrey S. (1990) "Election Methods, Black and Hispanic Council Membership", Social Science Quarterly, Vol. 71, No. 2, June, 339-355.

Zax, Jeffrey S. and Ichniowski, Casey (1990) "Bargaining Laws and Unionization in the Local Public Sector", Industrial and Labor Relations Review, Vol. 43, No. 4, April, 447-462.

Ichniowski, Casey and Jeffrey S. Zax (1990) "Today's Associations, Tomorrow's Unions", Industrial and Labor Relations Review, Vol. 43, No. 2, January, 191-208.

Zax, Jeffrey S. (1989) "Initiatives and Government Expenditures", Public Choice, Vol. 63, No. 3, December, 267-277.

Zax, Jeffrey S. (1989) "Quits and Race", Journal of Human Resources, Vol. 24, No. 3, Summer, 469-493.

Zax, Jeffrey S. (1989) "Is There a Leviathan in Your Neighborhood?", The American Economic Review, Vol. 79, No. 3, June, 560-567.

Zax, Jeffrey S. (1989) "Employment and Local Public Sector Unions", Industrial Relations, Vol. 28, No. 1, Winter, 21-31.

Zax, Jeffrey S. (1988) "Fringe Benefits, Tax Exemptions and Implicit Subsidies", Journal of Public Economics, Vol. 37, No. 2, November, 171-183.

Zax, Jeffrey S. (1988) "Wages, Nonwage Compensation and Municipal Unions", Industrial Relations, Vol. 27, No. 3, Fall, 301-317.

### **Papers in Edited Volumes**

Zax, Jeffrey S. and Yin He (forthcoming) "Chinese factor markets and intra-national integration", Regional Disparities in China, World Bank Press.

Zax, Jeffrey S. (2007) "Efficiency in China's urban labor markets", Chapter 10 in Urbanization in China: Critical Issues in an Era of Rapid Growth, Song, Yan and Chengri Ding, eds., Lincoln Institute of Land Policy, Cambridge, 209-234.

Zax, Jeffrey S. (2003) "Housing reform in urban China", in How Far Across the River? Chinese Policy Reform at the Millenium, Hope, Nicholas C., Dennis Tao Yang and Mu Yang Li, editors, Stanford University Press, Palo Alto, 313-350.

Zax, Jeffrey S. (2000) "The evolution of entrepreneurial activity in urban China, 1988-1995", in China's Labor Market and Problems of Employment, Wang, Yuguo and Aimin Chen, editors, The Southwest University of Finance and Economics Press, Chengdu, China, 481-500 (Chinese).

Yang, Guifang Lynn, and Jeffrey S. Zax (2000) "Gender-linked income differences in transitional urban China", in China's Labor Market and Problems of Employment, Wang, Yuguo and Aimin Chen, editors, The Southwest University of Finance and Economics Press, Chengdu, China, 566-584 (Chinese).

Li, Haizheng, and Jeffrey S. Zax (2000) "Economic transition and labor supply in urban China", in China's Labor Market and Problems of Employment, Wang, Yuguo and Aimin Chen, editors, The Southwest University of Finance and Economics Press, Chengdu, China, 217-233 (Chinese).

Zax, Jeffrey S. (1998) “Immigration, race and space”, in Help or Hindrance? The Economic Implications of Immigration for African Americans, Daniel S. Hamermesh and Frank D. Bean, eds., Russell Sage Foundation, 222-252.

Zax, Jeffrey S. (1988) “The Effects of Jurisdiction Types and Numbers on Local Public Finance”, in Fiscal Federalism: Quantitative Studies, Harvey S. Rosen, ed., National Bureau of Economic Research and the University of Chicago Press, 79-103.

Zax, Jeffrey S. and Casey Ichniowski (1988) “The Effects of Public Sector Unions on Payroll, Employment and Municipal Budgets”, in When Public Sector Workers Unionize, Richard B. Freeman and Casey Ichniowski, eds., National Bureau of Economic Research and the University of Chicago Press, 323-361.

Freeman, Richard B., Casey Ichniowski and Jeffrey S. Zax (1988) “Collective Organization in the Public Sector”, in When Public Sector Workers Unionize, Richard B. Freeman and Casey Ichniowski, eds., National Bureau of Economic Research and the University of Chicago Press, 365-398.

### **Published Book Reviews**

Zax, Jeffrey S. (2003) “Review of Urban Inequality: Evidence from Four Cities”, edited by Alice O'Connor, Chris Tilley and Lawrence D. Bobo, Journal of Economic Literature, Vol. 41, No. 1, March, 238.

### **Papers Under Journal Review**

Lynch, James G. and Jeffrey S. Zax, “The effects of prizes on contestant selection and performance: The case of Arabian horse racing” with James G. Lynch, revisions requested by the Journal of Labor Economics.

Zax, Jeffrey S. “The statistical properties of single regression estimates of voting behavior when turnout is unknown”, submitted to Political Analysis.

Zax, Jeffrey S. “Fifty years of Goodman’s Identity: Its implications for regression-based inference”, revisions to the American Journal of Sociology.

Zax, Jeffrey S., “Comment on ‘EI extended model and the fear of ecological fallacy’, by Baodong Liu”, submitted to Sociological Methods and Research, 31 October 2007.

## Working Papers

- “Housing allocations, welfare and inequality in early and mid-reform urban China”, December 2007.
- “Indications of market integration and efficiency in Chinese agriculture”, with Yin He, October, 2007.
- “Comment on ‘Bloc voting, polarization, and the Panethnic Hypothesis: The case of Little Saigon’, by Christian Collet”, October 2007.
- “Colorado’s Enterprise Zone Program: Impacts on Establishment–Level Employment and Earnings per Worker”, with Devon Lynch, February 2007.
- “Levels and changes in residential segregation, measured correctly”, with John Gardner, October 2004.
- “Do households vote with their feet?”, with Valeriy D. Gauzhstein, July 2004.
- “Commodification of urban Chinese housing in mid-reform”, July 2004.
- “Permanent, transitory and life-cycle inequality”, October 2002.
- “Marriage, divorce, income and military marriage incentives”, with David W. Flueck, April 2002.
- “Economic transition and the labor market in China” with Haizheng Li, March 2002.
- “Demand, supply and race in small business credit markets”, December 2001.
- “Bank credit and minority-owned small businesses in metropolitan Denver”, November 2000.
- “Gender-linked income differences in transitional urban China” with Guifang Lynn Yang, June 1999.
- “The evolution of entrepreneurial activity in urban China, 1988-1995”, May 1999.
- “ERISA, pension diversification and the welfare of workers and retirees”, with Mehmet M. Tutuncu, February 1998.
- “Fertility behavior and the absence of ‘missing females’ in urban China”, with Kathleen Greer Rossman, September 1997.

“Compensation for holding up half the sky? Gender-based income differences in urban China” with Lynn Yang, October 1996.

“Investment in education in urban China”, May 1996.

“The economic consequences of comparable worth policies”, with Kristyn N. Howard, February 1996.

“Analysis of client treatments for Colorado Child Welfare Service”, with Margaret Irish, February 1996.

“Involvement and reinvolvement: Child abuse and neglect in Colorado”, with Natalie Mullis, February 1996.

“Human capital in a workers' paradise: Returns to education in urban China”, August 1995.

“Maltreatment case loads and county characteristics in Colorado”, with Margaret Irish, May 1995.

“The stability of jobs in the local public sector”, with Jonathan S. Leonard, April 1995.

“When should economics majors take the introductory statistics course?”, with Douglas L. Jeavons and Larry D. Singell, January 1994.

“The effects of nonwage compensation on measured income distribution, income tax progressivity and returns to education”, October 1993.

“Optimal worker portfolios: Pensions, ESOPs and anti-ESOPs”, with Mehmet M. Tutuncu, May 1992.

“The effects of political voice on union formation among municipal employees”, November 1990.

“Progressive taxation and regressive subsidies: Income tax exemptions and nonwage compensation”, November 1989.

“The economic effects of function numbers in local government tiers”, July 1988.

## **Textbook in Progress**

Introductory Econometrics: Intuition, Proof and Practice.

## **Service as Editor and Referee**

Coeditor, Chinese Economic Review, January 2005 and continuing.

Referee for Journals: The American Economic Review, Asian Economic Journal, Contemporary Policy Issues, Economic Inquiry, Economic Journal, Economica, Economics of Governance, European Economic Review, International Economic Review, Industrial and Labor Relations Review, Industrial Relations, International Journal of Business and Economics, Journal of Applied Econometrics, Journal of Comparative Economics, Journal of Human Resources, Journal of Labor Economics, Journal of Law and Economics, Journal of Policy Analysis & Management, Journal of Political Economy, Journal of Public Economics, The Journal of Real Estate Finance and Economics, Journal of Regional Science, Journal of Sports Economics, Journal of the European Economic Association, Journal of Theoretical Politics, Journal of Urban Economics, Labour Economics: An International Journal, National Tax Journal, Papers in Regional Science, Public Choice, Public Finance Review, Publius, Regional Science and Urban Economics, Regional Science Perspectives, Review of Economics and Statistics, Review of Income and Wealth, Social Science Quarterly, Southern Economic Journal, Urban Affairs Review, Urban Geography and the World Bank Economic Review, August 1990 to present.

Referee for Foundations: National Science Foundation, Russell Sage Foundation, Research Grants Council of Hong Kong, August 1990 to present

## **Professional Memberships**

Member of the American Economic Association

Member of the Association for Public Policy Analysis and Management

Member of the Chinese Economists Society

Member of the Society of Labor Economists

## **Grants**

Principal Investigator, "Colorado Department of Transportation Safety Program Problem ID", State of Colorado Department of Transportation, 6/16/2006-6/15/2007.

Principal Investigator, "Colorado Department of Transportation Safety Program Problem ID and Annual Report", State of Colorado Department of Transportation, 6/16/2005-6/30/2006.

Principal Investigator, "Colorado Department of Transportation Safety Program Problem ID and Annual Report", State of Colorado Department of Transportation, 12/8/2004-6/30/2005.

Principal Investigator, "Colorado Department of Transportation Safety Program Annual Report", State of Colorado Department of Transportation, 11/5/2003-6/30/2004.

Principal Investigator, "Election Cycles, Balanced Budget Requirements and Tax Limitations in State Governments", Council on Research and Creative Work, University of Colorado, 7/1/1991-6/30/1992.

Principal Investigator, "Nonwage Compensation and Enterprise Performance", PSC-CUNY Award #668406, 7/1/1988-6/30/1989.

Principal Investigator, Social Science Research Council Dissertation Fellowship, no. SS-25-83-04, 12/1/1982-2/29/1984.

## **Awards and Honors**

Biography included in Who's Who in Economics, 4<sup>th</sup> Edition.

Biography included in Marquis Who's Who in America, 57<sup>th</sup> and 58<sup>th</sup> editions.

Biography included in Marquis Who's Who in American Education, 6<sup>th</sup> edition.

Biography included in Marquis Who's Who in the East, 23<sup>rd</sup> edition.

Biography included in Marquis Who's Who in Finance and Business, 35<sup>th</sup> edition.

Biography included in Who's Who Among American Teachers, 2004-2005.

Biography included in International Educator of the Year 2004.

Biography included in America's Registry of Outstanding Professionals 2002-2003.

Biography included in the Directory of American Scholars, 2001.

Stanford Calderwood Teaching Excellence Award from the Department of Economics at the University of Colorado at Boulder, May 2000.

Stanford Calderwood Teaching Excellence Award from the Department of Economics at the University of Colorado at Boulder, April 1993.

Fulbright Lecturer at the University of Ghana, Legon, Ghana, January-April 1990.

### **Additional Experience**

Consultant to the Attorney General of Arizona the statistical analysis of voting patterns, February 2008 and continuing.

Consultant to the City of Euclid, Ohio, March through August 2007.

Consultant to the Colorado Gaming Association, March 2007.

Consultant to the World Bank, May and June 2005.

Consultant to the Attorney of Adams County, April through May 2004.

Consultant to the Attorney General of South Dakota regarding the statistical analysis of voting patterns, March 2002 through June 2005.

Consultant to the State of Wyoming Legislative Service Office regarding labor market issues in the educational sector, July 2002 through November 2002.

Consultant to the Mountain States Legal Foundation regarding the statistical analysis of voting patterns, April 2002 through June 2002.

Consultant to the City of Valdez, Alaska, regarding economic integration and racial block voting, October 2001 through December 2001.

Expert witness for the Attorney General, the State of Montana, regarding racial and ethnic block voting, July 2001 through November 2001.

Consultant to the Attorney General of South Dakota regarding the statistical analysis of voting patterns, May 2000 through October 2000.

Expert witness for the Office of the Colorado State Attorney General regarding the effects of parental notification on adolescent abortions, September 1999 through June 2000.

Consultant to Sycare regarding evaluation of community mental health center performance, April 1999 through October 1999.

Consultant to BBC Research & Consulting and the State of Colorado Workforce Coordinating Council regarding evaluation of State-sponsored training programs, June 1998 through September 1998.

Consultant to the City Attorney of the City and County of Denver regarding the provision of bank credit to small minority-owned businesses, September 1997 through August 1998.

Expert witness for the Office of the Colorado State Attorney General regarding the effects of ballot position on voting behavior, March 1997 through May 1998.

Expert witness for the Attorney General, the State of Montana, regarding racial and ethnic block voting, November 1996 through August 1998.

Consultant to BBC Research & Consulting and the State of Colorado Economic Development Commission regarding the State's strategic plan for economic development, September 1996 through February 1997.

Expert witness for the Department of Attorney General, the State of Michigan, regarding variations in impacts of pollutants across ethnic groups, July 1996 through May 1997.

Consultant to the Forward Estes Park Foundation regarding local economic development issues, May 1996 through September 1996.

Consultant to the Department of Health Care Policy and Financing, Office of Public and Private Initiatives, the State of Colorado, regarding the evaluation of hospital performance, March 1996 through August 1996.

Consultant to the Department of Human Services, Office of Self Sufficiency Programs, the State of Colorado, regarding the evaluation of microentrepreneur training programs, January through September 1996 and January through August 1997

Principal contractor to the Piton Foundation for statistical analysis of child abuse incidence and treatment in Colorado, September 1994 through February 1996.

Expert witness for the Office of the Colorado State Attorney General regarding racial block voting in state legislative elections, October 1993 through June 1994.

Instructor in Introductory Mathematics for Economists, at the Economics Institute, Boulder, Colorado, August 1993.

Principal Investigator, review of econometric literature regarding the economic implications of health care reform for the Office of the Governor of the State of Colorado, April through July 1993.

Instructor in Masters' level Mathematics for Economists at the Economics Institute, Boulder, Colorado, March through May 1993.

Consultant to the Official Unsecured Creditors' Committee of Castle Pines North Metropolitan District, Colorado, regarding the effects of property tax rate increases on the rate of residential development, June 1992 through May 1993.

Advisor to the Cost and Quality Study of Early Care and Education project, at the University of Colorado at Denver Department of Economics, Spring 1992 through Fall 1994.

Instructor in Intermediate Microeconomics at the Economics Institute, Boulder, Colorado, May 1992.

Instructor in Intermediate Microeconomics and Introductory Mathematics for Economists, for the Economics Institute's program at the Ministry of Finance, Jakarta, Indonesia, May 1991.

Expert witness for the Del Valle School District, Texas, regarding the effects of different districting schemes on minority membership of the School Board, October 1990 through February 1991.

Instructor in applied econometric analysis, Institute of Economics, Chinese Academy of Social Sciences, Beijing, People's Republic of China, December 1988 and June 1990.

## **Appendix B: History of expert testimony for Jeffrey S. Zax**

## **History of Expert Participation Through Deposition or Testimony**

Jeffrey S. Zax, Ph.D.

15 February 2008

**The United States of America v. City of Euclid, Ohio and Cuyahoga County Board of Elections, Hazeltine**, United States District Court for the Northern District of Ohio, Eastern Division, Civil Action No. 1:06-CV-01652

Deposition: 25 May 2007

Testimony: 14 August 2007

**Bone Shirt, et al. v. Hazeltine, et al.**, United States Federal District Court for the District of South Dakota, Central Division, Civil Action No. 01-3032-KES (D.S.D.)

Deposition: 19 May 2003  
26 January 2004

Testimony: 26 April 2004

**Planned Parenthood of the Rocky Mountains, Inc., et al., v. William Owens, et al.**, United States District Court for the District of Colorado, Civil Action No. 99-WM-60.

Deposition: 11 February 2000  
24 February 2000  
1 June 2000

**Libertarian Party of Colorado, et al. v. Victoria Buckley**, United States District Court for the District of Colorado, Civil Action No. 96-WM-1983.

Testimony: 26 May 1998

**Earl Old Person, et al. v. Mike Cooney, et al.**, United States District Court for the District of Montana, Great Falls Division, Civ. No. CV-96-004-GF-PGH.

Deposition: 4 June 1997  
22 August 2001

Testimony: 26 March 1998  
6 November 2001

**NAACP-Flint Chapter v. Engler**, Circuit Court for Genesee County, State of Michigan, No. 95-38228.

Deposition: 7 February 1997  
21 April 1997

Testimony: 30 April 1997

**Jennie Sanchez, et al. v. State of Colorado, et al.**, United States District Court for the District of Colorado, Civil Action No. 93-S-963.

Deposition: 30 December 1993

Testimony: 24 March 1994

**Central Bank v. Castle Pines North, et al.**, District Court, County of Douglas, State of Colorado, Case No. 92-CV-4433.

Depositions: 17 March 1993  
12 April 1993

**Enrique G. Lopez, Jr., et al. v. Del Valle Independent School District, et al.**, 261st District Court of Travis County, State of Texas.

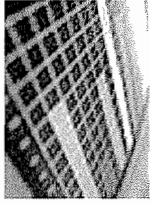
Depositions: 13 November 1990  
8 January 1991

Testimony: 5 February 1991

# **EXHIBIT**

## **C**

**U.S. Census Bureau**  
**American FactFinder**



**Arizona**  
**General Demographic Characteristics: 2004**  
**Data Set: 2004 American Community Survey**

NOTE. Data are limited to the household population and exclude the population living in institutions, college dormitories, and other group quarters. For information on confidentiality protection, sampling error, nonsampling error, and definitions, see Survey Methodology.

General Demographic Characteristics: 2004	Estimate	Lower Bound	Upper Bound
<b>Total population</b>	<b>5,633,997</b>	*****	*****
<b>SEX AND AGE</b>			
Male	2,792,592	2,784,834	2,800,350
Female	2,841,405	2,833,647	2,849,163
Under 5 years	451,904	446,280	457,528
5 to 9 years	424,715	407,999	441,431
10 to 14 years	425,726	410,666	440,786
15 to 19 years	378,479	368,968	387,990
20 to 24 years	404,808	399,675	409,941
25 to 34 years	795,972	790,233	801,711
35 to 44 years	787,022	781,743	792,301
45 to 54 years	715,327	711,317	719,337
55 to 59 years	294,506	284,835	304,177
60 to 64 years	246,507	235,673	257,341
65 to 74 years	394,356	389,558	399,154
75 to 84 years	251,822	245,956	257,688
85 years and over	62,853	57,164	68,542
Median age (years)	34.1	33.9	34.3
18 years and over	4,092,291	4,090,110	4,094,472
21 years and over	3,865,403	3,856,097	3,874,709
62 years and over	855,855	844,934	866,776
65 years and over	709,031	705,020	713,042
18 years and over	4,092,291	4,090,110	4,094,472
Male	2,007,628	1,999,612	2,015,644
Female	2,084,663	2,076,864	2,092,462
65 years and over	709,031	705,020	713,042
Male	320,002	318,519	321,485
Female	389,029	385,525	392,533
<b>RACE</b>			
One race	5,503,262	5,480,797	5,525,727
Two or more races	130,735	108,270	153,200
<b>Total population</b>	<b>5,633,997</b>	*****	*****
One race	5,503,262	5,480,797	5,525,727
White	4,359,283	4,287,648	4,430,918
Black or African American	170,057	163,521	176,593
American Indian and Alaska Native	270,662	247,323	294,001
Cherokee tribal grouping	8,042	3,828	12,256
Chippewa tribal grouping	443	0	1,058
Navajo tribal grouping	80,971	58,563	103,379
Sioux tribal grouping	1,341	0	2,717
Asian	123,766	118,578	128,954
Asian Indian	32,858	25,640	40,076

General Demographic Characteristics: 2004	Estimate	Lower Bound	Upper Bound
Chinese, except Taiwanese	19,246	14,899	23,593
Filipino	20,200	14,670	25,730
Japanese	7,954	5,391	10,517
Korean	8,498	4,337	12,659
Vietnamese	19,149	13,355	24,943
Other Asian	15,861	10,493	21,229
Native Hawaiian and Other Pacific Islander	8,065	6,356	9,774
Native Hawaiian	3,692	1,350	6,034
Guamanian or Chamorro	1,976	484	3,468
Samoaan	0	0	460
Other Pacific Islander	2,397	248	4,546
Some other race	571,429	496,594	646,264
Two or more races	130,735	108,270	153,200
White and Black or African American	22,260	16,148	28,372
White and American Indian and Alaska Native	30,730	18,282	43,178
White and Asian	17,120	12,664	21,576
Black or African American and American Indian and Alaska Native	3,144	1,479	4,809
<b>Race alone or in combination with one or more other races:</b>			
<b>Total population</b>	<b>5,633,997</b>	<b>*****</b>	<b>*****</b>
White	4,472,345	4,385,587	4,559,103
Black or African American	205,897	200,387	211,407
American Indian and Alaska Native	319,721	307,689	331,753
Asian	153,660	146,577	160,743
Native Hawaiian and Other Pacific Islander	11,271	8,944	13,598
Some other race	613,413	537,949	688,877
<b>HISPANIC ORIGIN AND RACE</b>			
<b>Total population</b>	<b>5,633,997</b>	<b>*****</b>	<b>*****</b>
Hispanic or Latino (of any race)	1,584,217	*****	*****
Mexican	1,433,823	1,408,075	1,459,571
Puerto Rican	17,945	12,966	22,924
Cuban	5,259	2,383	8,135
Other Hispanic or Latino	127,190	103,991	150,389
Not Hispanic or Latino	4,049,780	*****	*****
White alone	3,432,419	3,427,973	3,436,865
Black or African American alone	166,550	160,523	172,577
American Indian or Alaska Native alone	238,233	223,586	252,880
Asian alone	118,408	114,463	122,353
Native Hawaiian and Other Pacific Islander alone	6,589	5,599	7,579
Some other race alone	10,602	5,412	15,792
Two or more races:	76,979	58,517	95,441
Two races including Some other race	5,310	1,784	8,836
Two races excluding Some other race, and Three or more races	71,669	51,122	92,216
<b>RELATIONSHIP</b>			
<b>Household population</b>	<b>5,633,997</b>	<b>*****</b>	<b>*****</b>
Householder	2,176,011	2,158,229	2,193,793
Spouse	1,106,950	1,089,154	1,124,746
Child	1,683,899	1,659,214	1,708,584
Other relatives	362,091	335,354	388,828
Nonrelatives	305,046	282,682	327,410
Unmarried partner	142,189	129,586	154,792
<b>HOUSEHOLDS BY TYPE</b>			
<b>Total households</b>	<b>2,131,534</b>	<b>2,098,767</b>	<b>2,164,301</b>
Family households (families)	1,434,980	1,413,462	1,456,498
With own children under 18 years	677,378	660,591	694,165
Married-couple families	1,089,028	1,070,739	1,107,317
With own children under 18 years	467,849	450,903	484,795
Female householder, no husband present	258,048	239,540	276,556
With own children under 18 years	161,647	142,397	180,897
Nonfamily households	696,554	669,163	723,945
Householder living alone	562,106	535,373	588,839
65 years and over	176,984	165,088	188,880
Households with one or more people under 18 years	755,203	736,850	773,556
Households with one or more people 65 years and over	512,608	499,452	525,764

# **EXHIBIT**

## **D**

table with row headers in column A and column headers in row 3. (leading dots indicate sub-parts)

Table 1: Estimates of the Population by Selected Age Groups for the United States, States, and Puerto Rico: July 1, 2007

Geographic Total	Under 5 Yr	5 to 13 Yr	14 to 17 Yr	18 to 24 Yr	24 Yr to 16 Yr	18 Years a	18 Years a	15 to 44 Yr	45 to 64 Yr	65 Years a	85 Years and Over
United Stat	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####
Alabama	4,627,851	308,234	552,768	262,535	446,948	3,637,874	3,504,314	1,880,794	1,195,948	625,756	82,025
Alaska	683,478	51,311	86,484	44,423	73,172	524,326	501,260	305,521	181,778	47,935	4,543
Arizona	6,338,755	499,581	808,864	361,421	590,943	4,850,909	4,668,889	2,643,240	1,477,188	820,391	112,761
Arkansas	2,834,797	198,977	341,733	159,827	263,872	2,215,834	2,134,260	1,142,505	715,742	397,108	56,752
California	#####	2,660,386	4,524,590	2,198,948	3,832,021	#####	#####	#####	8,660,887	4,003,593	584,500
Colorado	4,861,515	349,902	578,343	264,434	459,917	3,802,612	3,668,836	2,117,997	1,257,630	492,685	64,753
Connectic	3,502,309	210,985	408,419	200,812	322,658	2,784,104	2,682,093	1,405,040	956,322	472,284	77,772
Delaware	864,764	58,869	98,827	47,950	84,868	683,539	659,118	352,395	225,239	117,678	15,333
District of	588,292	36,215	51,486	26,019	73,708	487,895	474,572	286,375	138,196	69,741	10,676
Florida	#####	1,148,213	1,948,094	947,253	1,595,264	#####	#####	7,145,922	4,681,530	3,098,364	493,778
Georgia	9,544,750	737,422	1,232,840	561,347	904,063	7,296,807	7,013,141	4,170,565	2,321,991	942,832	118,022
Hawaii	1,283,388	86,690	132,775	66,229	123,412	1,031,532	997,694	530,971	332,840	183,994	29,401
Idaho	1,499,402	118,630	198,599	90,483	147,047	1,137,712	1,091,690	618,043	367,055	174,946	24,673
Illinois	#####	891,315	1,571,044	736,800	1,292,270	#####	9,653,389	5,468,375	3,191,959	1,548,781	233,526
Indiana	6,345,289	437,494	782,990	366,034	605,135	4,943,883	4,758,771	2,618,075	1,621,442	795,441	114,665
Iowa	2,988,046	195,916	346,318	169,169	305,420	2,362,793	2,276,643	1,189,655	776,627	438,448	77,381
Kansas	2,775,997	196,138	340,593	159,351	289,947	2,161,059	2,079,915	1,139,351	701,097	360,216	60,712
Kentucky	4,241,474	278,330	493,320	232,323	383,950	3,355,492	3,237,501	1,750,555	1,113,258	549,504	71,744
Louisiana	4,293,204	298,157	528,804	252,599	466,256	3,342,139	3,213,644	1,796,052	1,086,231	522,334	68,613
Maine	1,317,207	70,744	136,239	72,484	112,422	1,075,094	1,037,740	506,071	391,934	194,986	27,927
Maryland	5,618,344	376,745	656,153	325,899	539,889	4,425,954	4,259,547	2,356,479	1,488,360	661,809	89,349
Massachu	6,449,755	376,848	705,820	350,188	641,055	5,196,652	5,016,899	2,704,289	1,718,777	858,939	139,754
Michigan	#####	633,017	1,208,248	605,591	973,666	7,934,832	7,624,966	4,125,853	2,678,986	1,280,152	181,746
Minnesota	5,197,621	353,901	609,464	296,917	507,397	4,089,100	3,937,339	2,162,376	1,363,876	636,216	104,864
Mississipp	2,918,785	219,282	371,898	177,524	302,407	2,239,618	2,150,081	1,201,310	717,666	364,614	50,676
Missouri	5,878,415	393,177	694,082	337,571	558,372	4,625,371	4,453,585	2,394,801	1,526,015	788,371	118,030
Montana	957,861	59,117	105,806	54,575	94,164	766,628	738,363	372,057	274,454	133,578	19,841
Nebraska	1,774,571	129,796	214,286	102,063	186,756	1,380,554	1,328,426	724,029	445,327	236,648	40,075
Nevada	2,565,382	194,651	322,007	143,344	210,117	1,976,966	1,905,380	1,084,975	642,528	285,654	29,868
New Hamj	1,315,828	75,125	147,182	75,879	119,035	1,056,521	1,017,642	529,293	380,187	165,742	23,948
New Jerse	8,685,920	556,673	1,018,458	488,658	766,049	6,870,036	6,622,131	3,553,989	2,302,420	1,134,636	169,186
New Mexic	1,969,915	144,945	239,790	115,541	204,881	1,528,616	1,469,639	811,493	495,340	250,235	33,895
New York	#####	1,196,688	2,140,741	1,075,985	1,974,693	#####	#####	8,157,719	4,996,316	2,546,405	384,636

.North Carr	9,061,032	637,664	1,083,026	496,990	855,111	7,095,276	6,843,352	3,790,795	2,324,127	1,103,413	142,606
.North Dak	639,715	39,988	68,116	34,705	83,331	514,785	496,906	265,672	164,395	93,285	17,450
.Ohio	#####	736,416	1,356,032	659,426	1,075,049	9,050,086	8,715,043	4,626,572	3,042,263	1,545,085	221,823
.Oklahoma	3,617,316	261,146	434,227	204,134	371,780	2,821,740	2,717,809	1,486,285	906,297	480,140	68,255
.Oregon	3,747,455	236,390	422,519	203,999	335,815	2,989,332	2,884,547	1,531,782	1,019,057	488,936	73,204
.Pennsylvania	#####	730,061	1,361,476	695,182	1,197,002	#####	9,646,073	4,912,978	3,370,799	1,889,660	302,279
.Rhode Isle	1,057,832	61,397	113,646	58,072	114,510	854,516	824,717	442,015	279,928	146,847	25,355
.South Car	4,407,709	296,302	513,914	249,701	430,834	3,475,812	3,347,792	1,807,236	1,156,945	573,098	72,499
.South Dak	796,214	56,450	94,216	46,224	82,237	622,827	599,324	315,274	205,586	113,555	20,088
.Tennessee	6,156,719	409,580	722,690	339,216	551,709	4,857,445	4,685,233	2,536,939	1,611,762	793,117	102,277
.Texas	#####	1,988,979	3,212,978	1,421,409	2,433,321	#####	#####	#####	5,494,877	2,394,157	318,320
.Utah	2,645,330	255,708	395,605	165,509	327,682	1,912,595	1,828,508	1,201,809	517,603	233,982	31,032
.Vermont	621,254	32,435	64,053	34,865	61,218	508,076	489,901	245,938	186,217	84,425	12,071
.Virginia	7,712,091	518,410	887,448	420,321	761,134	6,099,550	5,885,912	3,290,941	2,002,959	909,522	117,152
.Washingtc	6,468,424	423,096	748,431	364,841	597,971	5,117,600	4,932,056	2,719,418	1,730,987	757,852	111,429
.West Virgi	1,812,035	104,452	190,114	92,815	159,200	1,471,975	1,424,654	703,856	510,704	280,666	37,425
.Wisconsin	5,601,640	356,287	645,297	319,695	549,793	4,443,807	4,280,361	2,294,430	1,492,009	736,301	115,036
.Wyoming	522,830	35,890	59,793	29,682	52,944	412,679	397,465	210,974	145,175	63,901	8,572

Puerto Rico 3,942,375 245,188 515,463 242,293 396,057 3,061,525 2,939,431 1,662,480 935,710 522,899 63,484

Suggested Citation:

Table 1: Estimates of the Population by Selected Age Groups for the United States, States, and Puerto Rico: July 1, 2007 (SC-EST2007-01)

Source: Population Division, U.S. Census Bureau

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