

**IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION**

**CHICAGO TEACHERS UNION, LOCAL 1,
AMERICAN FEDERATION OF TEACHERS,
AFL-CIO; DONALD L. GARRETT JR.;
ROBERT GREEN and VIVONELL BROWN, JR.,**
individually and on behalf of all similarly situated
persons,

Plaintiffs,

v.

**BOARD OF EDUCATION OF THE CITY OF
CHICAGO,**

Defendant

**Case No. 15 CV 08149
Judge Sarah Ellis**

F.R.C.P. RULE 26(a)(2)(B) REPLY REPORT OF JONATHAN WALKER

I. INTRODUCTION

1. I am an economist. Labor economics is one of my areas of expertise. I have a bachelor's degree in economics from the University of California at Berkeley and a doctorate in economics from the Massachusetts Institute of Technology. As part of my undergraduate and graduate training, I took advanced courses in statistics and econometrics, the use of statistical tools to measure economic phenomena.
2. I am currently the President and Chief Executive Officer of Economists Incorporated ("EI"). EI was founded in 1981 for the primary purpose of providing microeconomics-related advice to individuals, corporations, non-profit organizations and governments. Among other business activities, EI regularly advises law firms and litigants about economics issues that arise in the context of litigation.
3. In addition to managing EI, I personally consult about economics topics in litigation matters. I have provided opinion testimony at trial, Teamsters hearings and deposition including testimony related to statistical analyses that I have conducted or supervised. I have been retained in matters involving allegedly discriminatory conduct and other employment-related topics and courts have relied upon my analysis in their written opinions. Exhibit A to this report is a copy of my curriculum vitae wherein I list all of the cases in which I have given opinion testimony.
4. Robin Potter and Associates, PC and its successor firm Potter Bolaños, LLC ("Potter Bolaños") retained me on behalf of the Chicago Teachers Union, Local 1 ("CTU") in other related litigation matters to assess whether the "Turnaround" policies that the Board of Education of the City of Chicago ("the Board") implemented in 2008 through 2012 had a disparate impact on African-American employees of the Chicago Public School system ("CPS"). The Turnaround Policies that the Board implemented did have disparate impact in those years. Presently, Potter Bolaños has asked me to review and respond to the expert report that Dr. David Blanchflower prepared in this case on behalf of the Board regarding the Board's implementation of substantially similar policies in 2013 and 2014. To prepare this report I have relied upon Dr. Blanchflower's January 30, 2018 report in this matter, his backup data to that report, his April 4, 2018 deposition testimony and my report in another CTU/CPS litigation matter.

5. EI is being compensated for my work in this case at my standard hourly billing rate of \$625. Other economists and research staff at EI have assisted me on this matter. EI is being compensated for their time at their standard hourly rates which range from \$280 to \$495 per hour. Neither my compensation nor EI's compensation for work on this matter depends in any way on the outcome of the litigation.

II. SUMMARY OPINION

6. In a report dated January 30, 2018, Dr. Blanchflower opines that, "there is no statistically significant evidence . . . of discrimination against African Americans."¹ Dr. Blanchflower's opinion is incorrect. In his report, Dr. Blanchflower presents data indicating statistically significant disparities between the rate at which African American and white CTU members were impacted by the 2013 and 2014 turnarounds. The data that Dr. Blanchflower compiled also demonstrate that there were statistically significant distinctions in racial composition between schools chosen for turnaround and other CPS elementary schools.

III. STATISTICAL EVIDENCE OF DISPARATE IMPACT

7. Dr. Blanchflower reviewed CPS business records and prepared a file showing the race of CTU employees across the CPS and at the schools selected for turnaround. He did this separately for 2013 and 2014.

8. According to Dr. Blanchflower, 114 out the 158 CTU members employed at 2013 Turnaround schools were African American, and 30 were white.² This corresponds to 72% African-American and 19% white. Dr. Blanchflower reports on the same page that 5,029 out of 18,705 CTU members systemwide were African American (27%), and 8,084 were white (43%). To summarize, 72% of CTU members employed at 2013 Turnaround schools were African-American although African-Americans were only 27% of all CTU members systemwide. Conversely, 19% of CTU members employed at 2013 Turnaround schools were white although white persons were 43% of CTU members systemwide. The disparity between the African American employment percentage at 2013 Turnaround Schools and the African American employment percentage systemwide (72% compared to 27%) is statistically significant at the 99%

¹ Rule 26(A)(1) Report of David G. Blanchflower, January 30, 2018, p. 27.

² Blanchflower (January 2018), p. 23.

level.³ Similarly, the disparity between white employment percentage at 2013 Turnaround Schools and white employment percentage systemwide (19% compared to 43%) is also statistically significant at the 99% confidence level.⁴

9. Turning to selection rates, according to Dr. Blanchflower's data, 114 out of 5,029 African American CTU members were directly impacted by the 2013 turnarounds (2.3%). Also according to Dr. Blanchflower's data, only 30 out of 8,084 white CTU members were directly impacted by the 2013 turnarounds (0.4%). This disparity between African American selection rate (2.3%) and white selection rate (0.4%) is statistically significant at the 99% confidence level.⁵ Moreover, the white selection rate was approximately 16% of the African American selection rate.⁶ The Uniform Guidelines on Employee Selection Procedures, Part 1607.4 (D) of the U.S. Code of Federal Regulations state that a selection rate for one group that is less than 80% of the selection rate for the highest group shall generally be regarded as evidence of adverse impact.

10. According to Dr. Blanchflower, 63 out of the 87 CTU members employed at 2014 Turnaround schools were African American, and 19 were white.⁷ This corresponds to 72% African-American and 22% white. Dr. Blanchflower reports on the same page that 4,648 out of 17,849 CTU members systemwide were African American (26%), and 7,703 were white (43%). To summarize, 72% of CTU members employed at 2014 Turnaround schools were African-American although African-Americans were only 26% of all CTU members systemwide. Conversely, 22% of CTU members employed at 2014 Turnaround schools were white although white persons were 43% of CTU members systemwide. The disparity between the African American employment percentage at 2014 Turnaround Schools and the African American employment percentage systemwide (72% compared to 26%) is statistically significant at the 99%

³ The test statistic for a two-sample z test is 12.72. The probability that the two percentages are the same is so small that it is not calculated by standard statistical packages. Stata calculates probabilities associated with the standard normal distribution as small as one in 100 million (equivalent to two in 100 million for a two-sided test), which is associated with a z statistic of 5.7.

⁴ The test statistic for a two-sample z test is 6.13, which corresponds to a probability of less than one in a million that the two percentages are the same.

⁵ The test statistic for a two-sample z test is 10.13, which corresponds to a probability of less than one in a million that the two percentages are the same.

⁶ The exact calculation is $(30/8,084) / (114/5,029)$.

⁷ Blanchflower, (January 2018), p. 25.

level.⁸ Similarly, the disparity between white employment percentage at 2014 Turnaround Schools and white employment percentage systemwide (22% compared to 43%) is also statistically significant at the 99% level.⁹ African Americans were overrepresented among CTU members directly and personally impacted by turnaround and white persons were underrepresented. The overrepresentation of African Americans and the underrepresentation of white persons among those CTU members directly and personally impacted by turnarounds were both statistically significant at the 99% confidence level. These statistically significant disparities occurred in both 2013 and 2014.

11. Turning to 2014 selection rates, according to Dr. Blanchflower's data, 63 out of 4,648 African American CTU members were directly impacted by the 2014 turnarounds (1.4%). Also according to Dr. Blanchflower's data, only 19 out of 7,703 white CTU members were directly impacted by the 2014 turnarounds (0.2%). The white selection rate was approximately 18% of the African American selection rate,¹⁰ and the disparity between African American and white selection rates is statistically significant at the 99% confidence level.¹¹

12. In prior reports, Dr. Blanchflower has conducted probit analyses that measure the effect of race on individual CTU members' probabilities of being directly impacted by a school turnaround. His data allow for a similar analysis here, but he has not performed such. I have conducted probit analyses related to the 2013 turnaround, 2014 turnaround and the combined 2013 and 2014 turnarounds. I report the results in Table 1. Probit analysis is a way to measure the effect of one variable on the likelihood of being in a category, here the group of CTU members impacted by the turnarounds. Table 1 summarizes the results from four separate analyses. In one analysis, I estimate the effect of race on the probability of a CTU member who was employed by the CPS just prior to the 2013 turnarounds being impacted by that round of turnarounds. In the second, I estimate the effect of race on the probability of a CTU member who was employed by the CPS just prior to the 2014 turnarounds being impacted by that round of turnarounds. In the third, I estimate

⁸ The test statistic for a two-sample z test is 9.80, which corresponds to a probability of less than one in a million that the two percentages are the same.

⁹ The test statistic for a two-sample z test is 4.01, which corresponds to a probability of approximately 6 in 100,000 that the two percentages are the same in a two-sided test.

¹⁰ The exact calculation is $(19/7,703) / (63/4,648)$.

¹¹ The test statistic for a two-sample z test is 7.35, which corresponds to a probability of less than one in a million that the two percentages are the same.

the effect of race on the probability of a CTU member who was employed by the CPS just prior to the 2013 turnarounds being impacted either by the 2013 or 2014 turnarounds. In the final analysis, I estimate the effect of race on the probability of a CTU member who was employed by the CPS just prior to the 2013 turnarounds being impacted either by the 2013 or 2014 turnarounds, and adding a year dummy to distinguish the two years, similar to Dr. Blanchflower. In all four cases, race was a statistically significant predictor of being impacted by turnaround.

IV. SCHOOL LEVEL ANALYSIS

13. Since everyone at a turnaround school is directly and personally impacted, the only way that the Board's 2013 and 2014 turnaround policies could have had disparate impact on African American CTU members is if the schools selected for turnaround were disproportionately staffed by African Americans. Charts 1 and 2 present scatter plots identifying the percentage of African American CTU members and the percentage of white CTU members at CPS schools in Dr. Blanchflower's 2013 and 2014 data, respectively. For each year, I have also plotted a vertical line indicating the median school in terms of percentage of CTU members who were African American. Schools plotted to the right of the dashed vertical line on each chart are schools that employ more than the "typical" percentage of African American CTU members. For each year, I have also plotted a horizontal line indicating the median school in terms of percentage of CTU members who were white. Schools plotted below the dashed horizontal line on each chart are schools that employ less than the "typical" percentage of white CTU members.¹² All five 2013 turnaround schools and all three 2014 turnaround schools are above the median in terms of African American employment percentage and below the median in terms of white employment percentage each year. Statistical comparison of schools' racial compositions confirms the graphical evidence presented in Charts 1 and 2 that the schools chosen for turnaround employed disproportionately many African Americans and disproportionately few white persons. I discuss this statistical analysis below.

14. Table 2 presents the schools selected for turnaround in 2013 and 2014, the percentage of CTU members at each school that were African American and white, and their absolute and

¹² A number of schools in each year have zero percent African American CTU members, including several with low percentages of white CTU members. I have confirmed that these schools have a large percentage of "other minority" CTU members in Dr. Blanchflower's data.

percentile ranking among all schools in terms of racial composition. As Table 2 indicates, in 2013 the Board designated five schools from among 472 for turnaround. When all 472 schools are sorted by percentage of CTU members employed there who were African American, these five schools selected for turnaround ranked from 29th to 111th highest in terms of percentage of CTU members who were African American. This range corresponds to the 77th to 94th percentile among CPS elementary schools in terms of percentage of African Americans CTU members employed. I calculated the probability of selecting five schools from among 472 by a race neutral process and have all five rank at the 77th percentile or higher in terms of African American employment. The probability of such an occurrence is 0.07%, well below the 5% threshold often used in classical hypothesis testing to define statistical significance and reject the null hypothesis—the null hypothesis here being that the school selection process was race neutral.¹³

15. In 2014, the Board designated three schools from among 425 for turnaround. When all 425 schools are sorted by percentage of CTU members employed there who were African American, the three schools selected for turnaround ranked from 42nd to 106th highest. This range corresponds to the 75th to 90th percentile among CPS elementary schools in terms of percentage of African Americans CTU members employed. I calculated the probability of selecting three schools from among 425 by a race neutral process and have all three rank at the 75th percentile or higher in terms of African American employment percentage. The probability of such an occurrence is 1.52%, again well below the 5% threshold often used in classical hypothesis testing to define statistical significance and reject the null hypothesis—the null hypothesis here being that the school selection process was race neutral.

16. Viewing the 2013 and 2014 turnarounds combined, the Board designated eight schools for turnaround. There are 425 schools that are in both the 2013 and 2014 data. When all 425 schools are sorted by percentage of CTU members employed there who were African American, the eight schools selected for turnaround ranked from 23rd to 103rd. This range corresponds to the 76th to 95th percentile in terms of percentage of African Americans CTU members employed among CPS elementary schools that were in both Dr. Blanchflower's 2013 and 2014 data. I calculated the probability of selecting eight schools from among 425 by a race neutral process

¹³ The probability of randomly choosing 5 schools from 472 schools and have all five rank 111 or higher is calculated directly as $(111/472) * (110/471) * (109/470) * (108/469) * (107/468)$, or 0.07%.

and have all eight rank 76th percentile or higher in terms of African American employment percentage. The probability of such an occurrence is less than 0.001%, i.e., less than one in one-hundred thousand, statistically significant and highly improbable if the school selection process was race neutral.

17. Turning now to an analysis of white employment at turnaround schools, when all 472 elementary schools as of 2013 are sorted by percentage of CTU members employed there who were white, the five schools selected for turnaround ranked from 353rd to 444th. This range corresponds to the 6th to 25th percentile among CPS elementary schools in terms of percentage of CTU members who were white. I calculated the probability of selecting five schools from among 472 by a race neutral process and have all five rank in the 25th percentile or lower in terms of white employment percentage. The probability of such an occurrence is 0.10%, i.e., one in one thousand.

18. When all 425 CPS elementary schools as of 2014 are sorted by percentage of CTU members employed there who were white, the three schools selected for turnaround ranked 411th highest, 326th highest and 236th highest. This corresponds to the 3rd, 23rd and 45th percentile among CPS elementary schools in terms of percentage of CTU members who were white, all well below the median for CPS elementary schools. I calculated the probability of selecting three schools from among 425 by a race neutral process and having one rank 3rd percentile or lower, another rank in the 23rd percentile or lower and the third rank 45th percentile or lower in terms of percentage of CTU members who were white. The probability of such an occurrence is 2.22%.¹⁴

19. Viewing the 2013 and 2014 turnarounds combined, when all 425 schools that are in both the 2013 and 2014 data are sorted by percentage of CTU members employed there who were white, the eight schools selected for turnaround ranked from 233rd to 407th. This range corresponds to the 4th to 45th percentile among CPS elementary schools in terms of percentage of CTU members who were white. I calculated the probability of selecting eight schools from among 425 by a race neutral process and have all eight rank in the 45th percentile or lower in

¹⁴ There are six different orderings for a selection process without replacement in which the schools selected ranked 45th percentile or lower, 23rd percentile or lower and 3rd percentile or lower in a given dimension. These orderings are (3rd, 23rd, 45th), (3rd, 45th, 23rd), (23rd, 3rd, 45th), (23rd, 45th, 3rd), (45th, 23rd, 3rd) and (45th, 3rd, 23rd). The probability of selecting three schools with these three percentile rankings or lower is the sum of the probabilities of each of these orderings.

terms of white employment percentage. The probability of such an occurrence was less than 0.16%.

20. A common threshold used in classical hypothesis testing to define statistical significance and reject the null hypothesis is 5% probability or less. Here the null hypothesis is that the turnaround selection process was race neutral. By this measure of statistical significance, schools selected for turnaround in 2013 and 2014 were different from other schools by a statistically significant degree. Turnaround schools had disproportionately high percentages of African American CTU employees and disproportionately low percentages of white CTU employees.

21. For his analysis of the school selection process, Dr. Blanchflower uses probit analysis and includes each school's performance points as a control variable. "Performance points" is a school performance metric that the CPS Board devised. When Dr. Blanchflower includes performance points in his probit analysis, race is not statistically significant. These probit analyses with performance points included mask the disparities in the rates at which African Americans are impacted by turnarounds in comparison to white CTU members. I have demonstrated in other reports that I have submitted in related CTU litigation matters that the racial composition of CPS schools' workforces and their performance points are correlated. Consequently, the Board could intentionally discriminate against African Americans by purposely using performance points as a selection criteria knowing that it affected African American CTU members disproportionately, or it could unintentionally discriminate by using performance points as a selection criteria for turnaround without business justification despite the differential impact this would have on African American CTU members. In either case, Dr. Blanchflower would get similar results as he reports notwithstanding that the Board discriminated against African American CTU members.

V. ERRORS

22. All of the analyses discussed above are based upon the CTU employee dataset that Dr. Blanchflower created. Dr. Blanchflower adjusted the employment data that CPS maintains in the ordinary course of business to account for duplicate entries and to account for the same individual holding multiple positions. Dr. Blanchflower has testified that he performed all of the adjustments himself without any independent review for quality control purposes.¹⁵ Such an

¹⁵ Blanchflower Deposition, April 4, 2018, pp. 579 and 679.

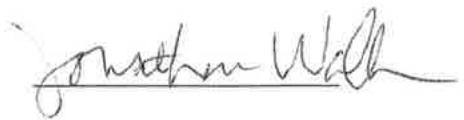
adjustment methodology will tend to experience higher error rates than one that includes a separate person checking for data entry and coding errors. For example, Dr. Blanchflower conducted his probit analyses using a race variable that was defined based on the original CPS dataset that included multiple positions per person and duplicate entries for some persons with only one position. Also, in 2013 there are 37 persons whom Dr. Blanchflower defined as “other race” for purposes of his probit analysis whom he claims are African American elsewhere, and many of the tables in Dr. Blanchflower’s text contain arithmetic errors. Relatedly, Dr. Blanchflower personally supplemented the race information that CPS maintains in the ordinary course of business with race information that he obtained from a third party. There is no evidence in the discovery record regarding the quality control methods this third person applied or what his normal error rate is. Notwithstanding these methodological issues, Dr. Blanchflower’s dataset seems to be reasonably reliable for the purposes that I have put it to. All or virtually all large datasets contain some erroneous data. Also, in my report in the litigation between CPS and the CTU concerning the 2011 layoffs, I showed that there was little effect on the analytical results by adopting the most extreme pro-Board assumptions regarding CTU members about whom CPS lacked race data.¹⁶

VI. CONCLUSIONS

23. Dr. Blanchflower’s data indicate that the 2013 and 2014 turnarounds had disparate impact on African American CTU members. There was statistically significant overrepresentation of African American CTU members among those impacted by the turnarounds and statistically significant underrepresentation of white CTU members among those impacted by the turnarounds. The disparities between African American and white selection rates were statistically significant. The white selection rate for impact was 16% of the African American rate in 2013 and 18% in 2014. The disparate impact is attributable to the CPS having chosen schools for turnaround that had particularly high percentages of African American CTU members and particularly low percentages of white CTU members among their employees. The higher percentages of African American CTU members and lower percentages of white CTU

¹⁶ F.R.C.P. RULE 26(a)(2)(B) REPORT OF JONATHAN WALKER, Case No. 12 C 10338, July 20, 2016, ¶¶19-20, 25.

members in comparison to the CPS as a whole were statistically significant.

A handwritten signature in black ink, appearing to read "Jonathan Walker". The signature is written in a cursive style with a horizontal line underneath the name.

Jonathan Walker

May 24, 2018

Table 1
Probability of a Worker Being in a Turnaround School
Probit

2013

Probit	Coefficient	(Z Stat)	[P-Value]
African-American	.677452	(11.29)	[0.000]
Other Minority	-0.1327	(-3.29)	[0.001]
Constant	-2.6744	(-16.67)	[0.000]
N		18,592	
Pseudo R2		0.0791	

2014

Probit	Coefficient	(Z Stat)	[P-Value]
African-American	0.5860	(5.34)	[0.000]
Other Minority	-0.3240	(-1.20)	[0.229]
Constant	-2.7942	(-13.29)	[0.000]
N		17,808	
Pseudo R2		0.0771	

2013 - 2014

Probit	Coefficient	(Z Stat)	[P-Value]
African-American	0.6409	(10.67)	[0.000]
Other Minority	-0.1986	(-2.06)	[0.040]
Constant	-2.7282	(-21.35)	[0.000]
N		36,400	
Pseudo R2		0.0779	

2013 - 2014

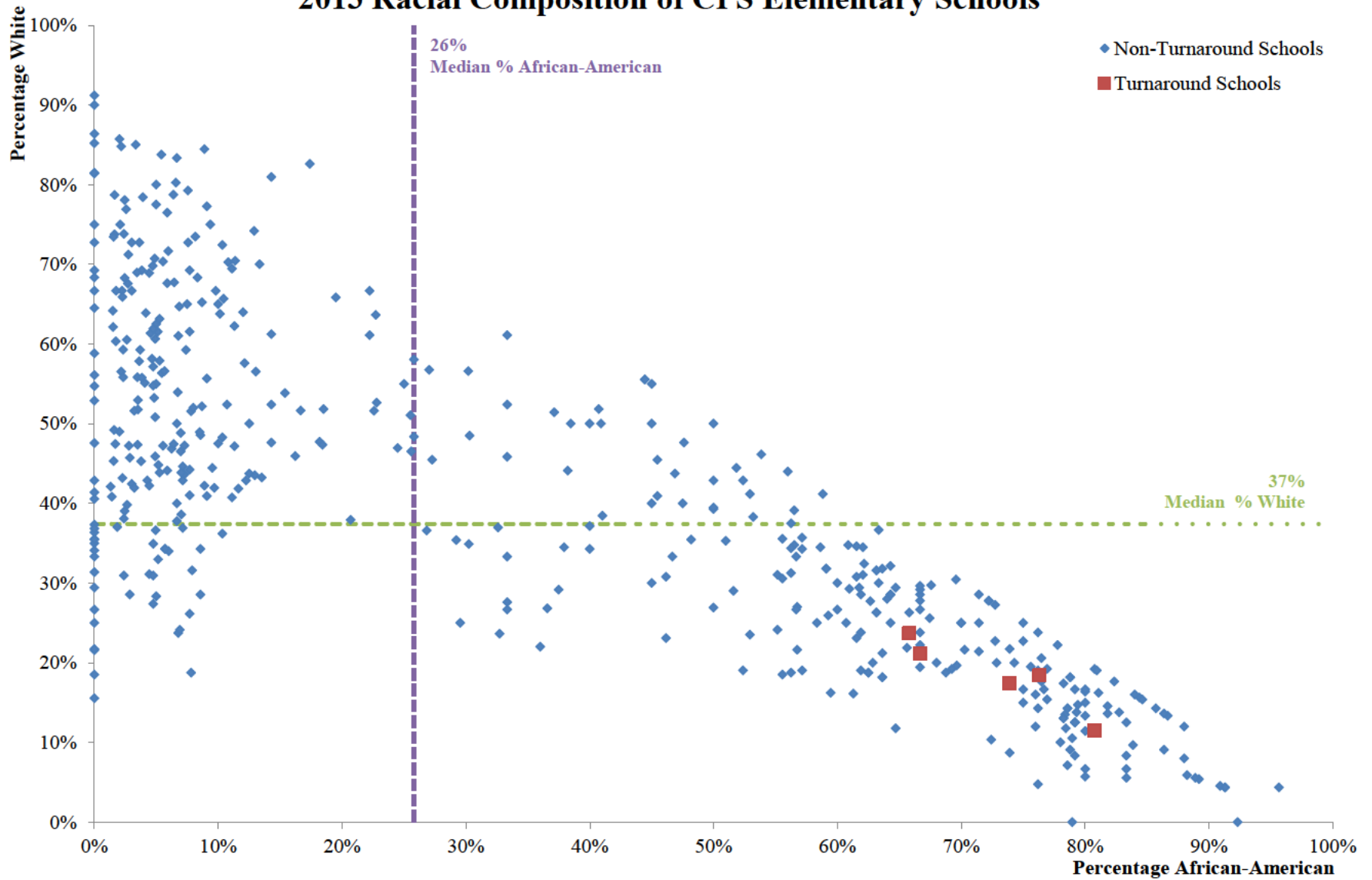
Probit	Coefficient	(Z Stat)	[P-Value]
African-American	0.6412	(10.40)	[0.000]
Other Minority	-0.2009	(-2.04)	[0.041]
2014 Dummy	-0.1971	(-0.72)	[0.474]
Constant	-2.6437	(-16.24)	[0.000]
N		36,400	
Pseudo R2		0.0834	

Sources: Dr. Blanchflower's productions.
(BLANCHFLOWER_15_0000002^Confidential Subject to Protective Order.dta, BLANCHFLOWER_15_0000004^Confidential Subject to Protective Order.dta.)

Note: Standard errors are clustered on school ID. 110 individuals in Dr. Blanchflower's 2013 data and 38 individuals in Dr. Blanchflower's 2014 data have no school ID and are omitted from the regression.

Chart 1

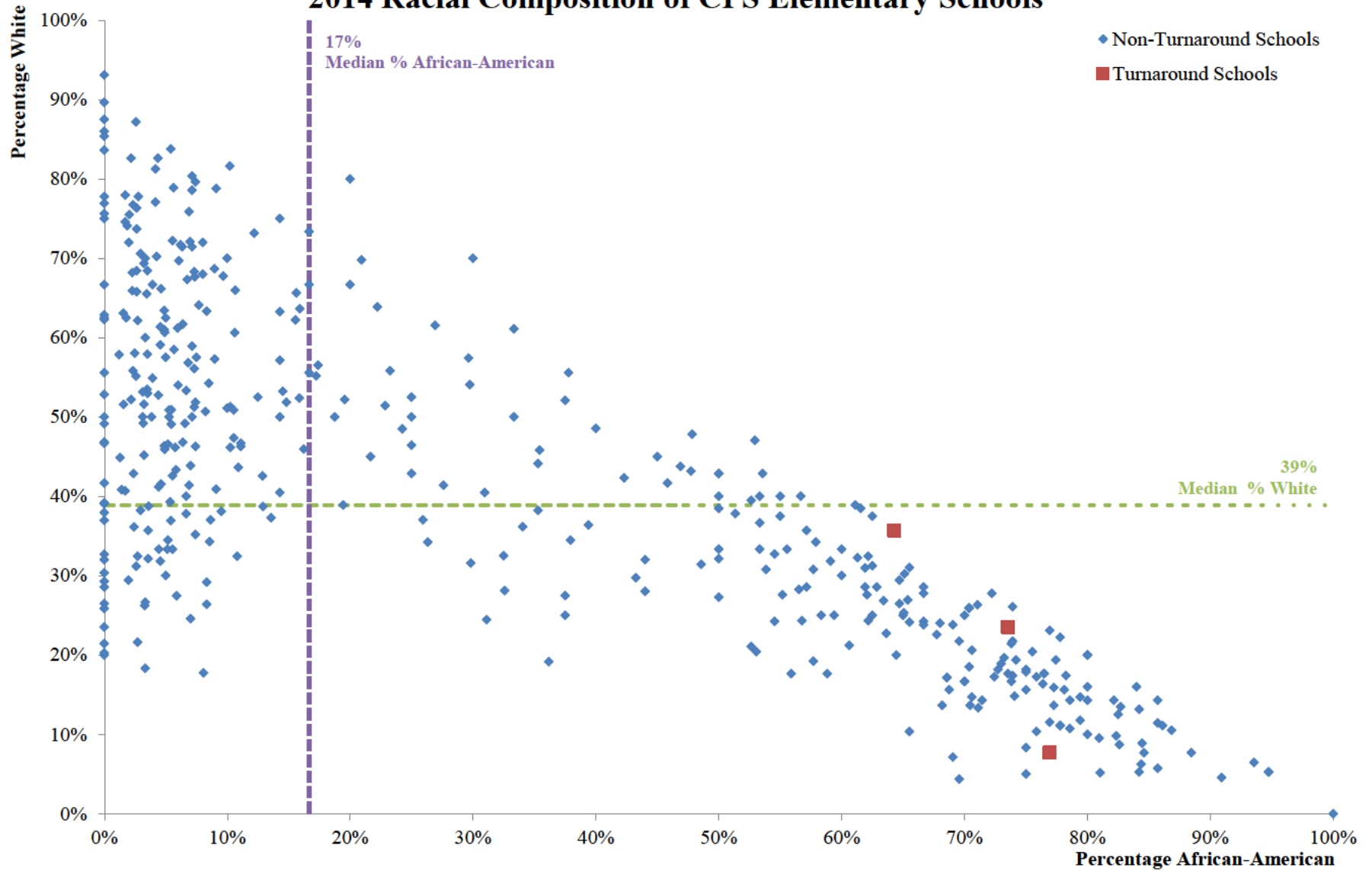
2013 Racial Composition of CPS Elementary Schools



Source: Dr. Blanchflower's productions. (BLANCHFLOWER_15_00000002^Confidential Subject to Protective Order.dta.)

Chart 2

2014 Racial Composition of CPS Elementary Schools



Source: Dr. Blanchflower's productions. (BLANCHFLOWER_15_0000004^Confidential Subject to Protective Order.dta.)

Table 2
Percentiles of Racial Composition

2013

Turnaround Schools	Percentage African-American	Ranking of Percentage African-American		Percentile Ranking of Percentage African-American		Percentage White	Ranking of Percentage White		Percentile Ranking of Percentage White	
		2013	2013 - 2014	2013	2013 - 2014		2013	2013 - 2014	2013	2013 - 2014
Carter	81%	29	23	94%	95%	12%	444	403	6%	5%
O'Keeffe	76%	67	51	86%	88%	18%	396	363	16%	15%
Chalmers	74%	80	63	83%	85%	17%	403	369	15%	13%
Dewey	67%	102	85	79%	80%	21%	371	343	21%	19%
Lewis	66%	111	92	77%	79%	24%	353	326	25%	23%
Number of Schools		472	425	472	425		472	425	472	425

2014

Turnaround Schools	Percentage African-American	Ranking of Percentage African-American		Percentile Ranking of Percentage African-American		Percentage White	Ranking of Percentage White		Percentile Ranking of Percentage White	
		2014	2013 - 2014	2014	2013 - 2014		2014	2013 - 2014	2014	2013 - 2014
Gresham	77%	42	69	90%	84%	8%	411	407	3%	4%
Dvorak	74%	63	70	85%	84%	24%	326	296	23%	30%
McNair	64%	106	103	75%	76%	36%	236	233	45%	45%
Number of Schools		425	425	425	425		425	425	425	425

Sources: Dr Blanchflower's productions (BLANCHFLOWER_15_00000002^Confidential Subject to Protective Order dta, BLANCHFLOWER_15_00000004^Confidential Subject to Protective Order dta)

Note: 2013 - 2014 distribution only includes schools that are in data in both years, and uses 2013 data as the baseline

Probability Calculations

Year	Ranking by Percentage African-American										
2013	Probability of selecting five schools from among 472 by a race neutral process and have all five rank 111 or higher when sorted by race:										0.067%
		111	110	109	108	107					
		472	471	470	469	468					
2014	Probability of selecting three schools from among 425 by a race neutral process and have all three rank 106 or higher when sorted by race:										1.519%
		106	105	104							
		425	424	423							
2013 - 2014	Probability of selecting eight schools from among 425 by a race neutral process and have all eight rank 103 or higher when sorted by race:										0.001%
		103	102	101	100	99	98	97	96		
		425	424	423	422	421	420	419	418		
	24 24%	24 06%	23 88%	23 70%	23 52%	23 33%	23 15%	22 97%			
Year	Ranking by Percentage White										
2013	Probability of selecting five schools from among 472 by a race neutral process and have all five rank 353 or lower when sorted by race:										0.096%
		119	118	117	116	115					
		472	471	470	469	468					
2014	Probability of selecting three schools from among 425 by a race neutral process and have one rank 15 or lower, one rank 100 or lower, and one rank 190 or lower										2.220%
		15	15	100	100	190					
		99	189	15	189	15	100				
2013 - 2014	Probability of selecting eight schools from among 425 by a race neutral process and have all eight rank 233 or lower when sorted by race:										0.160%
		188	99	188	15	99	15				
		0 37%	0 37%	0 37%	0 37%	0 37%	0 37%				
	192	191	190	189	188	187	186	185			
	425	424	423	422	421	420	419	418			
	45 18%	45 05%	44 92%	44 79%	44 66%	44 52%	44 39%	44 26%			

Exhibit A

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Education

Ph.D., Economics, Massachusetts Institute of Technology, 1991

A.B., Economics, University of California, Berkeley, 1983

Fellowships, Honors and Awards

1986: American Economic Association Doctoral Fellowship

1983: National Science Foundation Graduate Fellowship

1983: Honors in General Studies, University of California, Berkeley

Fields of Concentration

Industrial Organization, Labor Economics, Economic History

Professional Experience

2003 – Present: President, Economists Incorporated

2001 – 2002: Principal, Economists Incorporated

1998 – 2000: Senior Vice President, Economists Incorporated

1996 – 1998: Vice President, Economists Incorporated

1990 – 1996: Senior Economist, Economists Incorporated

Professional Experience (continued)

1988 – 1990: Management Consultant, Monitor Company, Cambridge, Massachusetts

1987 – 1988: Visiting Research Fellow, Federal Reserve Bank of Boston, Boston Massachusetts

1987: Teaching Assistant Massachusetts Institute of Technology

Dissertation

Essays on the Commercial Banking Industry

Publications

“Discounting Lost Future Earnings,” *Economists Ink*, Summer 2015
(with Erica Greulich)

“DTB and the Use of Regression Analysis to Assess Market Definition and Competitive Effects,” *Antitrust Law Section of the American Bar Association, Economics Committee Newsletter*, Spring 2011 (with Erica Greulich)

“Preparing for Trial: Expert Economic Testimony,” *Antitrust Section of the American Bar Association 59th Spring Meeting*, Continuing Legal Education Written Materials, March 2011

“The Single Entity Issue in American Needle and DTB,” *Westlaw Journal Antitrust*, Volume 18, Issue 1, April 2010 (with Erica Greulich)

“Event Studies, Toxic Stock and Non-Compete Provisions,” *Economists Ink*, Fall 2005

“Statistical Evidence and a Daubert Challenge in a Recent Discrimination Case,” *Economists Ink*, Summer 2004

“Price Increases Attributable to Patent Infringement or Entry,” *Economists Ink*, Spring 2004 (with Tessie Su)

“Ninth Circuit Expounds on Antitrust Injury,” *Economists Ink*, Fall 2003

“The Deterrence Value of Punitive Damages,” *Economists Ink*, Fall 2001 (with Laura Malowane)

Publications (continued)

“Recent Development in Bank Merger Competition Policy,” *Banking Law Review*, Spring 1992 (with Bruce Snapp and David Balto)

“U.S. Bank Merger Competition Policy,” *International Merger Law* 16, December 1991 (with Bruce Snapp)

“Not So Safe Harbor for Bank Mergers,” *Economists Ink*, Winter 1991

Panels

87th Annual Conference of the Western Economics Association International, “Sports Economics on Trial,” June 30, 2012 – Symposium panelist

American Bar Association Antitrust Section Annual Meetings, March 9, 2011 – Presentation concerning preparation for economic trial testimony

American Law Institute – American Bar Association Course of Study, “Antitrust Law in the 21st Century,” September 14-15, 2000 – Presentation concerning the economics of professional sports leagues

American Bar Association Antitrust Section Annual Meetings, April 14, 1999 – Presentation concerning the economic foundations of antitrust law

National Economists Club Educational Foundation, “What Effect Will Financial Restructuring Have On Banks?” August 13, 1991 – Moderator

Board Memberships

Economists Incorporated

SF-Marin Food Bank

Expert Reports and Testimony

Bobby Jones et al. v. Progressive Direct Insurance Co. et al. – Expert report and declaration on behalf of defendant concerning class certification and damages

In Re: Aaron Slator – Export report and arbitration testimony on behalf of respondent concerning contract damages

All-South Subcontractors, Inc. v. Sunbelt Rentals, Inc. – Expert report on behalf of defendant concerning class certification

Expert Reports and Testimony (continued)

Federal Deposit Insurance Corporation v. PricewaterhouseCoopers LLP and Crowe Horwath LLP – Expert report and deposition testimony on behalf of plaintiffs concerning damages

Precision Spine, Inc. and Spinal USA, Inc. v. Zavation, LLC et al. – Expert report and deposition testimony on behalf of plaintiffs concerning damages

Chicago Teachers Union et al. v. Board of Education of the City of Chicago et al. (Case No. 12 C 10311) – Expert reports (2), declaration and deposition testimony on behalf of plaintiffs concerning liability

Chicago Teachers Union et al. v. Board of Education of the City of Chicago et al. (Case No. 12 C 10338) – Expert report and deposition testimony on behalf of plaintiffs concerning liability

Charles Ridgeway, et al. v. Wal-Mart Stores, Inc. – Expert report, trial and deposition testimony on behalf of defendant concerning class injury and damages

Daniel Villalpando, et al. v. Exel Direct Inc., et al. – Expert report and deposition testimony on behalf of defendants concerning class damages

United States ex rel. Landis v. Tailwind Sports Corp., et al. – Expert report, declaration and deposition testimony of behalf of plaintiff concerning damages

The West Virginia Investment Management Board et al. v. The Variable Annuity Life Insurance Company – Expert report and deposition testimony on behalf of defendant concerning damages

In Re: Taco Bell Wage and Hour Actions – Expert reports (2), deposition and trial testimony on behalf of defendant concerning liability and remedies

In Re: Processed Egg Products Litigation – Expert reports (4), class decertification declaration, hearing and deposition testimony on behalf of defendants concerning antitrust damages and liability

Peter Sripramot v. Nor Cal Freight Mgmt., Inc., et al. – Expert report on behalf of defendant concerning damages

Moroccanoil Inc., v. Marc Anthony Cosmetics, Inc., et al. – Expert report and deposition testimony on behalf of plaintiff concerning trademark infringement remedies

Expert Reports and Testimony (continued)

Isidro Baricuatro, Jr., et al. v. Industrial Personnel and Management Services, Inc., et al. – Expert report and deposition testimony on behalf of defendants concerning Fair Labor Standards Act and contract damages

Ameira Watters v. General Motors LLC, et al. – Expert report on behalf of defendants concerning damages

Louis Cimaglia v. Royal Pontiac Buick GMC Inc., et al. – Expert report on behalf of defendants concerning damages

United States v. Bank of America Corp. et al. – Expert report and deposition testimony on behalf of defendants concerning financial harm

Diane Zwarg v. BB&T Insurance Services of California, Inc., et al. – Trial and deposition testimony on behalf of defendants concerning damages

Ritchie Risk – Linked Strategies Trading (Ireland), Ltd., et al. v. Coventry First LLC, et al. – Expert report and deposition testimony on behalf of defendants concerning economic loss

In Re: BDO Seidman – Expert report and deposition testimony on behalf of defendant concerning damages from alleged breach of professional responsibility

U.S. SEC v. Ralph Cioffi – Deposition testimony on behalf of defendant concerning hedge fund operations

Ultra Internet Media, S.A., et al. v. Caesars License Company, LLC et al. – Expert report on behalf of defendants concerning damages

Lauren Knowles v. Kelly Buick, Inc., et al. – Expert report on behalf of defendants concerning economic loss

Kenneth D. Klaas, et al. v. Vestin Mortgage Inc., et al. – Expert reports (2) on behalf of defendants concerning contract damages

Tyr Sport, Inc. v. Warnaco Swimwear, Inc., United States Swimming, Inc., et al. – Expert report on behalf of defendants concerning antitrust liability

United States of America v. Ralph Cioffi and Matthew Tannin – Testimony at criminal trial on behalf of defendants concerning hedge fund operations

Charles M. Felton et al. v. Vestin Realty Mortgage II, et al. – Deposition testimony and testimony at a bench trial on behalf of defendants concerning contract damages

Expert Reports and Testimony (continued)

National Union Fire Insurance Co. of Pittsburgh, PA v. Puget Plastics Corporation et al. – Deposition testimony and testimony at a bench trial on behalf of plaintiff concerning lost profits and diminution in business value

Deutscher Tennis Bund, et al. v. ATP Tour Inc. – Expert reports (2), deposition testimony and testimony at a jury trial on behalf of defendant concerning antitrust liability

John Johnson, et al. v. Big Lots Stores, Inc. – Expert reports (2), declarations (2), deposition testimony, and testimony at a bench trial on behalf of defendant concerning alleged violation of Fair Labor Standards Act.

MGP Ingredients, Inc. v. Mars, Inc. and S&M NuTec, LLC – Expert report and deposition testimony on behalf of defendant concerning damages

In Re: H Street Building Corporation – Deposition testimony on behalf of defendant concerning damages

In Re: The National Benevolent Association of the Christian Church (Disciples of Christ), et al. – Expert report, rebuttal report and deposition testimony on behalf of plaintiff concerning damages

Chemical Overseas Holdings Inc., et al. v. Republica Oriental Del Uruguay, et al. – Expert report, supplemental report and arbitration testimony on behalf of respondents concerning damages

In Re: Lockheed Meridian, MS Shooting Incident – Expert reports (3) and deposition testimony on behalf of defendant concerning damages

John D. Wee v. Charles Schwab & Co., Inc. – Arbitration testimony on behalf of plaintiff concerning damages

In Re: Robin Singh d/b/a Test Masters – Expert reports (2), declaration and deposition testimony on behalf of plaintiff concerning damages

Patrick J. Cunningham and Anton N. Zanki v. International Business Machines Corporation – Expert report, rebuttal report and deposition testimony on behalf of defendant concerning alleged breach of contract

Mark Hodges, et al. v. Greater Canton Ford Mercury, Inc., et al. – Expert report on behalf of defendant concerning punitive damages

Expert Reports and Testimony (continued)

In Re: Frank T. Vega – Declaration on behalf of defendant concerning damages

Martin Leach v. Ford Motor Co. – Expert report on behalf of defendant concerning the corporate officer labor market in a breach of contract suit

Westways World Travel, Inc. and Sundance Travel Service v. AMR Corp., et al. – Expert report and deposition testimony on behalf of defendants concerning compensatory damages

Traci A. Savage v. Ford Motor Co. – Expert report on behalf of defendant concerning the economics of punitive damages

Randy Eugene Wheeler v. Ford Motor Co. – Deposition testimony on behalf of defendant concerning lost NFL earnings and other alleged damages

David Braswell v. Holley Performance Products Inc. – Expert report and rebuttal on behalf of defendant concerning antitrust liability and antitrust damages

Ertha Mae Williams v. CSX Transportation Inc., et al. – Deposition testimony on behalf of defendants concerning the economics of punitive damages

R. Straman Co. and Newport Convertible Engineering, Inc. v. Volkswagen of America, et al. – Deposition testimony on behalf of defendants concerning antitrust liability and antitrust injury

Roll International Corporation and Paramount Farms, Inc. v. Unilever United States, Inc. and Conopco, Inc. – Testimony at jury trial on behalf of defendants regarding compensatory damages for alleged breach of contract and false promise

Newhall Land and Farming Co. v. Kerr McGee Operating Corporation, et al. – Deposition testimony on behalf of defendants concerning the economics of punitive damages

Marcia Spielholz, et al. v. Los Angeles Cellular Telephone Company, et al. – Expert report on behalf of defendants concerning remedies in a class action false advertising suit

David N. Orrik v. Stryker Corporation, et al. - Deposition testimony on behalf of defendants concerning the economics of punitive damages

Agneta Karlsson, et al. v. Michael A. Savage – Deposition testimony on behalf of defendants concerning the economics of punitive damages and product liability

Expert Reports and Testimony (continued)

Homestore, Inc. v. America Online – Expert report and arbitration testimony on behalf of respondent concerning damages from breach of contract

Michael Meitus, et al. v. Dain Rauscher Wessels, Dain Rauscher Corporation and Dain Rauscher Inc. – Arbitration testimony on behalf of claimants concerning the competitive structure of the securities industry and other economic matters

In Re: 1994 Exxon Chemical Plant Fire – Expert report on behalf of defendant concerning the economics of punitive damages

Avis Buchanan, et al v. Consolidated Stores Corp. – Declaration and deposition testimony on behalf of defendant concerning statistical and other economic analyses in a class action public accommodations suit

State of Alabama v. Exxon Corporation – Affidavit and testimony at post-trial hearing on behalf of defendant concerning the economics of punitive damages

Aspen Knolls Corp., et al v. McDermott Will & Emery – Expert report on behalf of defendant concerning damages in a legal malpractice suit

Legi-Slate Inc. v. Thomson Information Services Inc. – Expert reports (2) and deposition testimony on behalf of plaintiff concerning damages from breach of contract

United States of America ex rel., William I. Koch and William A. Presley v. Koch Industries, Inc., et al. – Expert report, deposition testimony and testimony at jury trial on behalf of defendants concerning economic issues in a False Claims Act suit

Ronald O. Lewis v. Booz-Allen & Hamilton Inc. – Expert reports (4) and deposition testimony on behalf of plaintiff regarding statistics and damages in an employment discrimination suit

Richard Rogers Mason v. Ford Motor Company – Expert report and deposition testimony on behalf of defendant regarding liability in a product liability suit

Dr. Michael J. Galvin v. The New York Racing Association, Inc., et al. – Expert report and declaration on behalf of defendant regarding commercial damages in breach of due process and tortious interference suit

Roll International Corporation and Paramount Farms, Inc. v. Unilever United States, Inc., et al. – Deposition and bench trial testimony on behalf of defendants regarding business valuation and damages in a breach of contract and fraudulent misrepresentation suit

Expert Reports and Testimony (continued)

Yvonne Trout, et al. v. John Dalton, et al. – Affidavit and declaration on behalf of the United States concerning prejudgment interest

Willie Brown Jr., et al. v. General Motors Corporation – Testimony at deposition and jury trial concerning lost NFL player earnings

Royer Homes of Mississippi, Inc., et al. v. Redman Homes, Inc., et al. – Affidavits (2), expert reports (2) and deposition testimony on behalf of defendants concerning antitrust liability and damages

W. C. and A. N. Miller Companies v. United States of America – Expert report and deposition testimony on behalf of defendant concerning commercial damages in a Federal Tort Claims Act suit

SMS Systems Maintenance Services, Inc. v. Digital Equipment Corporation – Expert report and deposition testimony on behalf of defendant concerning antitrust damages and liability

Francis W. Murray and FWM Corporation v. National Football League, et al. – Expert report and deposition testimony on behalf of defendants regarding market definition, alleged anticompetitive conduct and alleged antitrust injury

Michael A. Willner v. Dow Jones & Company, Inc., et al. – Deposition testimony on behalf of defendants regarding damages in a breach of contract and unfair dealing suit

Dream Team Collectibles, Inc. v. NBA Properties, Inc. – Expert reports (2) and deposition testimony on behalf of NBA Properties regarding damages and other economic issues in a trademark infringement suit and counter suit

Breezevale Limited v. Timothy L. Dickinson, et al. – Deposition and jury trial testimony on behalf of defendants regarding commercial damages in a legal malpractice suit

Sonja Lumpkin v. Citizens Bank of Maryland, Incorporated – Affidavit on behalf of defendant regarding damages in a wrongful termination suit

Carolee Brady Hartman, et al. v. Joseph Duffey – Declarations (7) and live testimony at four Teamsters Hearings on behalf of the defendant, the United States Government, regarding damage estimation in a class action sex discrimination suit

Expert Reports and Testimony (continued)

Robert B. Reich v. Charles I. Brown, Peter M. Mazula, and Ronald F. Nuzman – Affidavit and deposition testimony for the United States Department of Labor regarding alleged breach of fiduciary responsibility under ERISA

United Farmers Agents Association, Inc. v Farmers Insurance Exchange, et al. and Thomas J. Vinson, et al. v Farmers Insurance Exchange, et al. – Affidavit and deposition testimony for plaintiffs regarding antitrust liability

Anthony Brown, et al. v Pro Football, Inc. – Testimony for defendants, the member clubs of the NFL, at jury trial regarding antitrust damages

Robert E. Connor, et al. v. Harris County, et al. – Deposition testimony and a written declaration for plaintiffs, members of a class of job applicants, regarding a cost defense for allegedly discriminatory employment practices

Laura Kelber against Forest Electric Corp. and Forest Datacom – Affidavit in opposition to defendants’ motion for summary judgement in a sex discrimination suit

Selected Consulting Matters

Ernst & Young/ KPMG – Antitrust consulting regarding potential consolidation

NASCAR Souvenirs – Consulting for defendants concerning class certification in an antitrust matter

First Databank – Antitrust consulting regarding acquisition of Medi-Span Inc.

Metal Supermarkets – Consulting for plaintiff regarding commercial damages arising from legal malpractice

Vulcan – Antitrust consulting regarding the acquisition of an Atlanta quarry

Brodus v. Children’s National Medical Center – Consulting regarding damages in a wrongful termination suit

International Paper – Antitrust consulting regarding photographic paper and other photographic material

St. Louis Convention and Visitors Commission v. National Football League, et al. – Antitrust consulting regarding franchise relocation

The Baltimore City Paper – Consulting regarding commercial damages allegedly arising from libel

Selected Consulting Matters (continued)

Allied Domecq – Consulting for liquor supplier regarding terminated dealer’s lost profits

National Football League – Consulting regarding trademark and antitrust issues in suits between the Dallas Cowboys and its affiliates and the NFL

IndyCar Racing – Antitrust consulting

Albertson’s – Antitrust consulting for potential plaintiff in a price-fixing matter

New Orleans Hospitals – Antitrust consulting regarding joint venture among New Orleans hospitals

General Dynamics – Consulting for plaintiff regarding damages in commercial litigation

Telecom Technical Services, et al. v. ROLM – Consulting for plaintiffs in antitrust litigation

The Boston Herald – Consulting regarding damages allegedly caused by publication of a news story

Automotive Dismantlers and Recyclers Association v. ADP Claims Solutions Group, Inc. – Antitrust consulting regarding used automobile parts databases

Mercy/St. Vincent – Consulting regarding the merger of two hospital systems in Toledo, Ohio

Kalium/IMC – Consulting regarding the merger of Kalium and IMC

Agricultural Chemicals Antitrust Litigation – Antitrust consulting for defendants, Zeneca Corp., Helena Corp. and Terra Corp. in an RPM class action suit

The Clorox Company v. Sterling Winthrop, Inc., et al. – Antitrust consulting for plaintiffs in litigation alleging misuse of trademark protections for anticompetitive gain

Chittenden Corporation – Antitrust consulting regarding a bank holding company’s acquisition plans

National Basketball Association – Damage estimation for the NBA in antitrust suit brought against it by Independent Entertainment Group Incorporated

Selected Consulting Matters (continued)

Magic Line Inc. – Merger of ATM networks

Home Shopping Network – Ex-post valuation of contingent contract concerning software and consulting services

Lenfest Group, Comcast Corporation and Telecommunications Incorporated – Consultation regarding Delaware Public Service Commission rules to implement the Telecommunications Technology Investment Act

Worthen Financial Corporation – Acquisition of Union National Bank of Arkansas

Intrust Bank – Merger with Kansas State Bank & Trust

Iowa National Bankshares – Merger with MidAmerica Savings Banks *First*

National Bank of Kerrville – Acquisition of Bank of Kerrville *Peoples Heritage*

Financial Group – Acquisitions of Mid Maine Savings Bank, Bank of New Hampshire, CFX, and certain branches of Fleet Bank of Maine

Potash Antitrust Litigation – Antitrust consulting for defendants in a class action suit alleging price fixing in the potash industry

R&D Business Systems, et al. v. Xerox Corporation – Antitrust consulting for plaintiffs in a class action suit alleging tying and monopolization in the copier and printer industries

Society Corp. – Acquisition of Ameritrust

VDDE Holm, Voest Alpina, Bohler – Antitrust consulting in connection with the merger of two European steel manufacturers

McNeil, et al. v. NFL – Estimation of damages resulting from player reservation system

U.S Department of Justice v. City of Alhambra, California – Analysis of evidence of discriminatory hiring practice

Christiana Mortgage Brokers, et al. v. Delaware Trust, et al. – Estimation of damages resulting from tortious interference in the mortgage brokerage industry in New Castle County, Delaware

Selected Consulting Matters (continued)

Merger of Two Savings and Loan Assns. – Antitrust consulting in connection with the merger of two thrift institutions

Mid Atlantic Coca-Cola – Analysis of evidence of price fixing and estimation of resulting damages

Professional Societies

American Economic Association

American Bar Association

Industrial Organization Society

Western Economics Association

American Law and Economics Association

Society of Labor Economics