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01	ADAIR	C001	SKELLY								
01	ADAIR	C019	PEAVINE								
01	ADAIR	C022	MARYETTA								
01	ADAIR	C024	ROCKY MOUNTAIN								
01	ADAIR	C028	ZION								
01	ADAIR	C029	DAHLONEGAH								
01	ADAIR	C032	GREASY								
01	ADAIR	I004	WATTS								
01	ADAIR	I011	WESTVILLE								
01	ADAIR	I025	STILWELL								
01	ADAIR	I030	CAVE SPRINGS								
02	ALFALFA	I001	BURLINGTON								
02	ALFALFA	I046	CHEROKEE				92.65%	97.89%			
02	ALFALFA	I093	TIMBERLAKE								
03	ATOKA	C021	HARMONY								
03	ATOKA	C022	LANE								
03	ATOKA	C023	FARRIS								
03	ATOKA	I007	STRINGTOWN								
03	ATOKA	I015	ATOKA								
03	ATOKA	I019	TUSHKA								
03	ATOKA	I026	CANEY								
04	BEAVER	I022	BEAVER								
04	BEAVER	I075	BALKO								
04	BEAVER	I123	FORGAN								
04	BEAVER	I128	TURPIN								
05	BECKHAM	I002	MERRITT								
05	BECKHAM	I006	ELK CITY								
05	BECKHAM	I031	SAYRE								
05	BECKHAM	I051	ERICK								
06	BLAINE	I009	OKEENE		99.79%				177.20%		
06	BLAINE	I042	WATONGA								
06	BLAINE	I080	GEARY								
06	BLAINE	I105	CANTON								
07	BRYAN	I001	SILO								
07	BRYAN	I002	ROCK CREEK								
07	BRYAN	I003	ACHILLE							92.24%	
07	BRYAN	I004	COLBERT								
07	BRYAN	I005	CADDO								
07	BRYAN	I040	BENNINGTON							89.88%	104.69%
07	BRYAN	I048	CALERA								
07	BRYAN	I072	DURANT								87.20%
08	CADDO	I011	HYDRO-EAKLY								
08	CADDO	I012	LOOKEBA SICKLES								
08	CADDO	I020	ANADARKO								
08	CADDO	I033	CARNEGIE								
08	CADDO	I056	BOONE-APACHE								
08	CADDO	I064	CYRIL			94.56%	90.19%				
08	CADDO	I086	GRACEMONT								
08	CADDO	I160	CEMENT								
08	CADDO	I161	HINTON				116.70%				
08	CADDO	I167	FORT COBB-BROXTON								
08	CADDO	I168	BINGER-ONEY		92.25%						
09	CANADIAN	C029	RIVERSIDE								
09	CANADIAN	C031	BANNER								
09	CANADIAN	C070	DARLINGTON								
09	CANADIAN	C162	MAPLE								
09	CANADIAN	I022	PIEDMONT							247.36%	
09	CANADIAN	I027	YUKON			86.53%			527.07%		121.85%
09	CANADIAN	I034	EL RENO						143.41%		
09	CANADIAN	I057	UNION CITY					91.63%			97.98%
09	CANADIAN	I069	MUSTANG							95.93%	
09	CANADIAN	I076	CALUMET								108.22%
10	CARTER	C072	ZANEIS								
10	CARTER	I019	ARDMORE								
10	CARTER	I021	SPRINGER								
10	CARTER	I027	PLAINVIEW				87.20%				162.09%
10	CARTER	I032	LONE GROVE		117.25%	113.33%	118.92%		431.53%		
10	CARTER	I043	WILSON			85.75%					
10	CARTER	I055	HEALDTON					101.05%			85.51%
10	CARTER	I074	FOX								

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10	CARTER	I077	DICKSON							86.43%	90.68%
11	CHEROKEE	C010	LOWREY								
11	CHEROKEE	C014	NORWOOD								
11	CHEROKEE	C021	WOODALL							232.12%	
11	CHEROKEE	C026	SHADY GROVE								
11	CHEROKEE	C031	PEGGS								
11	CHEROKEE	C034	GRAND VIEW			86.17%					
11	CHEROKEE	C044	BRIGGS								
11	CHEROKEE	C066	TENKILLER								
11	CHEROKEE	I006	KEYS								
11	CHEROKEE	I016	HULBERT								
11	CHEROKEE	I035	TAHLEQUAH			89.33%		495.38%			
12	CHOCTAW	C003	GRANT								
12	CHOCTAW	C021	SWINK								
12	CHOCTAW	I001	BOSWELL								
12	CHOCTAW	I002	FORT TOWSON								
12	CHOCTAW	I004	SOPER								
12	CHOCTAW	I039	HUGO								
13	CIMARRON	I002	BOISE CITY								
13	CIMARRON	I010	FELT								
13	CIMARRON	I011	KEYES								86.91%
14	CLEVELAND	C016	ROBIN HILL								
14	CLEVELAND	I002	MOORE		97.58%	111.53%	97.81%		186.08%	92.98%	
14	CLEVELAND	I029	NORMAN								97.62%
14	CLEVELAND	I040	NOBLE								
14	CLEVELAND	I057	LEXINGTON							92.90%	
14	CLEVELAND	I070	LITTLE AXE				100.63%	121.03%			
15	COAL	C004	COTTONWOOD								
15	COAL	I001	COALGATE								
15	COAL	I002	TUPELO								
16	COMANCHE	C048	FLOWER MOUND								
16	COMANCHE	C049	BISHOP								
16	COMANCHE	I001	CACHE				396.72%				
16	COMANCHE	I002	INDIAHOMA								
16	COMANCHE	I003	STERLING		85.95%					109.27%	
16	COMANCHE	I004	GERONIMO								563.95%
16	COMANCHE	I008	LAWTON								
16	COMANCHE	I009	FLETCHER								91.95%
16	COMANCHE	I016	ELGIN								396.60%
16	COMANCHE	I132	CHATTANOOGA				86.10%	93.49%			
17	COTTON	I001	WALTERS								
17	COTTON	I101	TEMPLE								
17	COTTON	I333	BIG PASTURE		86.96%	92.93%					
18	CRAIG	C001	WHITE OAK								
18	CRAIG	I006	KETCHUM								
18	CRAIG	I017	WELCH								
18	CRAIG	I020	BLUEJACKET								
18	CRAIG	I065	VINITA								
19	CREEK	C001	MILFAY								
19	CREEK	C008	LONE STAR		87.99%						93.85%
19	CREEK	C012	GYPSY								
19	CREEK	C034	PRETTY WATER							88.26%	
19	CREEK	C035	ALLEN-BOWDEN								
19	CREEK	I002	BRISTOW								223.31%
19	CREEK	I003	MANNFORD								
19	CREEK	I005	MOUNDS		91.51%	86.06%	122.98%	104.06%		97.99%	
19	CREEK	I017	OLIVE								
19	CREEK	I018	KIEFER		88.92%					85.33%	
19	CREEK	I020	OILTON							288.03%	
19	CREEK	I021	DEPEW								
19	CREEK	I031	KELLYVILLE							88.23%	90.54%
19	CREEK	I033	SAPULPA			86.50%				85.07%	
19	CREEK	I039	DRUMRIGHT					95.35%		94.23%	
20	CUSTER	I005	ARAPAHO-BUTLER				298.39%				
20	CUSTER	I007	THOMAS-FAY-CUSTER UNIFIED DIST							280.41%	
20	CUSTER	I026	WEATHERFORD								
20	CUSTER	I099	CLINTON				353.72%			88.60%	
21	DELAWARE	C006	CLEORA								
21	DELAWARE	C014	LEACH								
21	DELAWARE	C030	KENWOOD								

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21	DELAWARE	C034	MOSELEY								
21	DELAWARE	I001	JAY								143.18%
21	DELAWARE	I002	GROVE		85.18%	91.73%	101.51%				
21	DELAWARE	I003	KANSAS								
21	DELAWARE	I004	COLCORD								
21	DELAWARE	I005	OAKS-MISSION								
22	DEWEY	I005	VICI								
22	DEWEY	I008	SEILING								
22	DEWEY	I010	TALOGA								
23	ELLIS	I002	FARGO								
23	ELLIS	I003	ARNETT								
23	ELLIS	I039	GAGE								
23	ELLIS	I042	SHATTUCK								
24	GARFIELD	I001	WAUKOMIS								
24	GARFIELD	I018	KREMLIN-HILLSDALE								
24	GARFIELD	I042	CHISHOLM				88.76%				87.19%
24	GARFIELD	I047	GARBER				98.51%				
24	GARFIELD	I056	PIONEER-PLEASANT VALE								
24	GARFIELD	I057	ENID				485.15%			95.62%	
24	GARFIELD	I085	DRUMMOND								
24	GARFIELD	I094	COVINGTON-DOUGLAS								90.63%
25	GARVIN	C016	WHITEBEAD								
25	GARVIN	I002	STRATFORD				88.74%	94.27%		99.98%	
25	GARVIN	I005	PAOLI								
25	GARVIN	I007	MAYSVILLE								
25	GARVIN	I009	LINDSAY								
25	GARVIN	I018	PAULS VALLEY							88.87%	
25	GARVIN	I038	WYNNEWOOD								
25	GARVIN	I072	ELMORE CITY-PERNELL								
26	GRADY	C037	FRIEND				89.15%				93.46%
26	GRADY	C096	MIDDLEBERG								
26	GRADY	C131	PIONEER								90.45%
26	GRADY	I001	CHICKASHA				362.05%		269.83%		160.02%
26	GRADY	I002	MINCO							298.23%	
26	GRADY	I051	NINNEKAH								
26	GRADY	I056	ALEX								
26	GRADY	I068	RUSH SPRINGS								
26	GRADY	I095	BRIDGE CREEK						424.28%		
26	GRADY	I097	TUTTLE					328.60%			
26	GRADY	I099	VERDEN								
26	GRADY	I128	AMBER-POCASSET								
27	GRANT	I054	MEDFORD								
27	GRANT	I090	POND CREEK-HUNTER				87.51%	99.56%			
27	GRANT	I095	DEER CREEK-LAMONT								
28	GREER	I001	MANGUM					96.32%			
28	GREER	I003	GRANITE								
29	HARMON	I066	HOLLIS								
30	HARPER	I001	LAVERNE								
30	HARPER	I004	BUFFALO								
31	HASKELL	C010	WHITEFIELD								
31	HASKELL	I013	KINTA								
31	HASKELL	I020	STIGLER								
31	HASKELL	I037	MCCURTAIN								
31	HASKELL	I043	KEOTA								
32	HUGHES	C009	DUSTIN								
32	HUGHES	I001	MOSS		89.09%	102.74%	94.13%	94.55%			
32	HUGHES	I005	WETUMKA					85.53%		105.60%	85.67%
32	HUGHES	I035	HOLDENVILLE								
32	HUGHES	I048	CALVIN								
32	HUGHES	I054	STUART								
33	JACKSON	I001	NAVAJO								
33	JACKSON	I014	DUKE								
33	JACKSON	I018	ALTUS								
33	JACKSON	I025	ELDORADO								
33	JACKSON	I035	OLUSTEE								
33	JACKSON	I054	BLAIR								
34	JEFFERSON	C003	TERRAL								
34	JEFFERSON	I001	RYAN					87.19%		95.77%	88.14%
34	JEFFERSON	I014	RINGLING								
34	JEFFERSON	I023	WAURIKA								

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35	JOHNSTON	C007	MANNSVILLE		95.30%	99.70%					
35	JOHNSTON	C010	RAVIA								
35	JOHNSTON	I002	MILL CREEK								
35	JOHNSTON	I020	TISHOMINGO								
35	JOHNSTON	I029	MILBURN								
35	JOHNSTON	I035	COLEMAN								
35	JOHNSTON	I037	WAPANUCKA							89.78%	96.56%
36	KAY	C027	PECKHAM				95.12%				
36	KAY	C050	KILDARE								
36	KAY	I045	BLACKWELL							522.06%	
36	KAY	I071	PONCA CITY				116.56%	139.31%			
36	KAY	I087	TONKAWA				97.83%				
36	KAY	I125	NEWKIRK								
37	KINGFISHER	I002	DOVER								
37	KINGFISHER	I003	LOMEGA								
37	KINGFISHER	I007	KINGFISHER								
37	KINGFISHER	I016	HENNESSEY		87.64%	91.12%	99.16%				
37	KINGFISHER	I089	CASHION					114.11%			
37	KINGFISHER	I105	OKARCHE								
38	KIOWA	I001	HOBART								
38	KIOWA	I002	LONE WOLF								
38	KIOWA	I003	MOUNTAIN VIEW-GOTEBO								
38	KIOWA	I004	SNYDER								
39	LATIMER	I001	WILBURTON								
39	LATIMER	I002	RED OAK								
39	LATIMER	I003	BUFFALO VALLEY								
39	LATIMER	I004	PANOLA								
40	LE FLORE	C004	SHADY POINT								
40	LE FLORE	C011	MONROE								
40	LE FLORE	C014	HODGEN								
40	LE FLORE	C039	FANSHAWE								
40	LE FLORE	I002	SPIRO								
40	LE FLORE	I003	HEAVENER		103.21%						
40	LE FLORE	I007	POCOLA								
40	LE FLORE	I016	LE FLORE			92.68%		99.64%			
40	LE FLORE	I017	CAMERON								
40	LE FLORE	I020	PANAMA								
40	LE FLORE	I026	BOKOSHE								
40	LE FLORE	I029	POTEAU								
40	LE FLORE	I049	WISTER					86.82%		112.46%	
40	LE FLORE	I052	TALIHINA								
40	LE FLORE	I062	WHITESBORO								
40	LE FLORE	I067	HOWE							131.98%	
40	LE FLORE	I091	ARKOMA								
41	LINCOLN	C005	WHITE ROCK								
41	LINCOLN	I001	CHANDLER								126.62%
41	LINCOLN	I003	DAVENPORT					95.82%			
41	LINCOLN	I004	WELLSTON								146.53%
41	LINCOLN	I054	STROUD								
41	LINCOLN	I095	MEEKER							93.18%	
41	LINCOLN	I103	PRAGUE						330.95%		
41	LINCOLN	I105	CARNEY								100.58%
41	LINCOLN	I134	AGRA					86.18%	150.33%		
42	LOGAN	I001	GUTHRIE								93.64%
42	LOGAN	I002	CRESCENT								
42	LOGAN	I003	MULHALL-ORLANDO								
42	LOGAN	I014	COYLE								
43	LOVE	C003	GREENVILLE								
43	LOVE	I004	THACKERVILLE								
43	LOVE	I005	TURNER				103.99%				98.53%
43	LOVE	I016	MARIETTA			137.95%				144.58%	
44	MAJOR	I001	RINGWOOD					88.46%	163.94%		
44	MAJOR	I004	ALINE-CLEO								
44	MAJOR	I084	FAIRVIEW								
44	MAJOR	I092	CIMARRON					98.03%			
45	MARSHALL	I002	MADILL							207.37%	
45	MARSHALL	I003	KINGSTON						345.21%		
46	MAYES	C021	SPAVINAW								
46	MAYES	C035	WICKLIFFE								
46	MAYES	C043	OSAGE								

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46	MAYES	I001	PRYOR					184.68%			
46	MAYES	I002	ADAIR						148.66%		
46	MAYES	I016	SALINA							87.06%	
46	MAYES	I017	LOCUST GROVE							85.55%	258.74%
46	MAYES	I032	CHOUTEAU-MAZIE								
47	MCCLAIN	C004	BYARS								
47	MCCLAIN	I001	NEWCASTLE								298.18%
47	MC CLAIN	I002	DIBBLE					87.85%			
47	MCCLAIN	I005	WASHINGTON							96.26%	
47	MCCLAIN	I010	WAYNE								
47	MC CLAIN	I015	PURCELL				153.80%			99.68%	100.19%
47	MC CLAIN	I029	BLANCHARD	627.21 *				91.05%	856.23%		
48	MCCURTAIN	C001	FOREST GROVE								
48	MCCURTAIN	C009	LUKFATA								
48	MCCURTAIN	C023	GLOVER								
48	MCCURTAIN	C037	DENISON								
48	MC CURTAIN	C072	HOLLY CREEK					92.90%		97.35%	
48	MCCURTAIN	I005	IDABEL								97.47%
48	MC CURTAIN	I006	HAWORTH				246.05%				
48	MCCURTAIN	I011	VALLIANT								
48	MCCURTAIN	I013	EAGLETOWN								
48	MCCURTAIN	I014	SMITHVILLE								
48	MCCURTAIN	I039	WRIGHT CITY								
48	MCCURTAIN	I071	BATTIEST								
48	MCCURTAIN	I074	BROKEN BOW								
49	MCINTOSH	C003	RYAL								
49	MCINTOSH	C016	STIDHAM								
49	MCINTOSH	I001	EUFAULA								
49	MCINTOSH	I019	CHECOTAH				366.64%				
49	MCINTOSH	I027	MIDWAY								
49	MCINTOSH	I064	HANNA								
50	MURRY	I001	SULPHUR					88.59%			
50	MURRY	I010	DAVIS			93.47%	96.18%				
51	MUSKOGEE	C009	WAINWRIGHT								
51	MUSKOGEE	I002	HASKELL							139.76%	
51	MUSKOGEE	I003	FORT GIBSON								
51	MUSKOGEE	I006	WEBBERS FALLS			88.20%		113.19%			102.00%
51	MUSKOGEE	I008	OKTAHA								
51	MUSKOGEE	I020	MUSKOGEE							171.45%	
51	MUSKOGEE	I029	HILLDALE								
51	MUSKOGEE	I046	BRAGGS								
51	MUSKOGEE	I074	WARNER								
51	MUSKOGEE	I088	PORUM								
52	NOBLE	I001	PERRY							432.14%	
52	NOBLE	I002	BILLINGS								
52	NOBLE	I004	FRONTIER								
52	NOBLE	I006	MORRISON								246.82%
53	NOWATA	I003	OKLAHOMA UNION								
53	NOWATA	I040	NOWATA			118.39%	91.13%	105.63%		92.15%	97.01%
53	NOWATA	I051	SOUTH COFFEYVILLE								
54	OKFUSKEE	C029	BEARDEN					94.81%		98.50%	98.39%
54	OKFUSKEE	I002	MASON								
54	OKFUSKEE	I014	PADEN								
54	OKFUSKEE	I026	OKEMAH					98.27%		103.84%	
54	OKFUSKEE	I031	WELEETKA								
54	OKFUSKEE	I032	GRAHAM				105.58%	134.49%			
55	OKLAHOMA	C029	OAKDALE								119.98%
55	OKLAHOMA	C074	CRUTCHO			91.14%	102.75%				
55	OKLAHOMA	I001	PUTNAM CITY				146.63%			102.86%	
55	OKLAHOMA	I003	LUTHER								
55	OKLAHOMA	I004	CHOCTAW-NICOMA PARK		114.27%	110.95%	107.71%				
55	OKLAHOMA	I006	DEER CREEK			102.74%	106.61%	100.91%		102.42%	91.82%
55	OKLAHOMA	I007	HARRAH								
55	OKLAHOMA	I009	JONES						557.27%		
55	OKLAHOMA	I012	EDMOND				93.83%	93.75%	90.85%	99.81%	100.19%
55	OKLAHOMA	I037	MILLWOOD							299.16%	
55	OKLAHOMA	I041	WESTERN HEIGHTS					302.14%			
55	OKLAHOMA	I052	MIDWEST CITY-DEL CITY		257.20%			123.62%	93.21%		
55	OKLAHOMA	I053	CROOKED OAK					411.20%			
55	OKLAHOMA	I088	BETHANY		96.64%				104.81%		

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55	OKLAHOMA	I089	OKLAHOMA CITY		94.66%	103.41%	109.55%		239.19%	90.73%	98.16%
56	OKMULGEE	C011	TWIN HILLS			268.57%				89.12%	
56	OKMULGEE	I001	OKMULGEE								
56	OKMULGEE	I002	HENRYETTA							174.44%	
56	OKMULGEE	I003	MORRIS				256.69%				
56	OKMULGEE	I004	BEGGS				86.07%		191.04%		
56	OKMULGEE	I005	PRESTON								170.94%
56	OKMULGEE	I006	SCHULTER		96.69%						275.08%
56	OKMULGEE	I007	WILSON						94.60%		
56	OKMULGEE	I008	DEWAR				86.99%		113.04%		
57	OSAGE	C003	OSAGE HILLS								
57	OSAGE	C007	BOWRING								
57	OSAGE	C035	AVANT								
57	OSAGE	C052	ANDERSON					160.86%			
57	OSAGE	C077	MCCORD								
57	OSAGE	I002	PAWHUSKA								
57	OSAGE	I011	SHIDLER								
57	OSAGE	I029	BARNSDALL								
57	OSAGE	I030	WYNONA					89.58%			
57	OSAGE	I038	HOMINY		91.04%	114.94%					90.32%
57	OSAGE	I050	PRUE								
57	OSAGE	I090	WOODLAND								
58	OTTAWA	C010	TURKEY FORD								
58	OTTAWA	I001	WYANDOTTE								91.41%
58	OTTAWA	I014	QUAPAW								
58	OTTAWA	I018	COMMERCE								
58	OTTAWA	I023	MIAMI						108.52%		
58	OTTAWA	I026	AFTON								
58	OTTAWA	I031	FAIRLAND								
59	PAWNEE	C002	JENNINGS								157.20%
59	PAWNEE	I001	PAWNEE								
59	PAWNEE	I006	CLEVELAND								
60	PAYNE	C104	OAK GROVE								
60	PAYNE	I003	RIPLEY			85.70%	383.37%				
60	PAYNE	I016	STILLWATER		117.82%	99.47%	111.98%	93.58%	184.25%		98.14%
60	PAYNE	I056	PERKINS-TRYON								151.59%
60	PAYNE	I067	CUSHING								
60	PAYNE	I101	GLENCOE				108.63%	128.54%			
60	PAYNE	I103	YALE								
61	PITTSBURG	C009	KREBS								
61	PITTSBURG	C029	FRINK-CHAMBERS								
61	PITTSBURG	C056	TANNEHILL								
61	PITTSBURG	C088	HAYWOOD								
61	PITTSBURG	I001	HARTSHORNE								
61	PITTSBURG	I002	CANADIAN								
61	PITTSBURG	I011	HAILEYVILLE								
61	PITTSBURG	I014	KIOWA								
61	PITTSBURG	I017	QUINTON								
61	PITTSBURG	I025	INDIANOLA								
61	PITTSBURG	I028	CROWDER								
61	PITTSBURG	I030	SAVANNA								
61	PITTSBURG	I063	PITTSBURG						96.89%		
61	PITTSBURG	I080	MCALESTER								
62	PONTOTOC	I001	ALLEN								
62	PONTOTOC	I009	VANOSS						93.15%		
62	PONTOTOC	I016	BYNG								
62	PONTOTOC	I019	ADA			86.80%					
62	PONTOTOC	I024	LATTA							88.08%	
62	PONTOTOC	I030	STONEWALL								
62	PONTOTOC	I037	ROFF					94.74%			
63	POTTAWATOMIE	C010	NORTH ROCK CREEK								
63	POTTAWATOMIE	C027	GROVE							104.84%	
63	POTTAWATOMIE	C029	PLEASANT GROVE					90.91%		94.02%	
63	POTTAWATOMIE	C032	SOUTH ROCK CREEK								
63	POTTAWATOMIE	I001	MCLOUD								
63	POTTAWATOMIE	I002	DALE				244.44%				
63	POTTAWATOMIE	I003	BETHEL						412.73%		
63	POTTAWATOMIE	I004	MACOMB								
63	POTTAWATOMIE	I005	EARLSBORO								
63	POTTAWATOMIE	I092	TECUMSEH								

District who qualified for (85%) by their Est. of Needs, submitted bond election results or series bond sinking fund data

History of Districts with Bonded Indebtedness of 85% or more for Class Size

10/11/2012

County		District		Bond Year 2013 (7/1/12-6/30/13)	Bond Year 2012 (7/1/11-6/30/12)	Bond Year 2011 (7/1/10-6/30/11)	Bond Year 2010 (7/1/09-6/30/10)	Bond Year 2009 (7/1/08-6/30/09)	Bond Year 2008 (7/1/07-6/30/08)	Bond Year 2007 (7/1/06-6/30/07)	Bond Year 2006 (7/1/05-6/30/06)
63	POTTAWATOMIE	I093	SHAWNEE				202.83%				268.43%
63	POTTAWATOMIE	I112	ASHER								
63	POTTAWATOMIE	I115	WANETTE			85.58%	87.69%				
63	POTTAWATOMIE	I117	MAUD								
64	PUSHMATAHA	C002	ALBION								
64	PUSHMATAHA	C004	TUSKAHOMA								
64	PUSHMATAHA	C015	NASHOBA								
64	PUSHMATAHA	I001	RATTAN								
64	PUSHMATAHA	I010	CLAYTON								
64	PUSHMATAHA	I013	ANTLERS								
64	PUSHMATAHA	I022	MOYERS								
65	ROGER MILLS	I003	LEEDEY								
65	ROGER MILLS	I006	REYDON								
65	ROGER MILLS	I007	CHEYENNE								
65	ROGER MILLS	I015	SWEETWATER								
65	ROGER MILLS	I066	HAMMON								
66	ROGERS	C009	JUSTUS-TIAWAH						102.19%		
66	ROGERS	I001	CLAREMORE								
66	ROGERS	I002	CATOOSA						124.89%		
66	ROGERS	I003	CHELSEA								179.94%
66	ROGERS	I004	OOLOGAH-TALALA								
66	ROGERS	I005	INOLA				126.63%				
66	ROGERS	I006	SEQUOYAH		94.11%			614.90%			
66	ROGERS	I007	FOYIL								
66	ROGERS	I008	VERDIGRIS								
67	SEMINOLE	C054	JUSTICE								
67	SEMINOLE	I001	SEMINOLE								
67	SEMINOLE	I002	WEWOKA			96.95%	379.39%				
67	SEMINOLE	I003	BOWLEGS								
67	SEMINOLE	I004	KONAWA								
67	SEMINOLE	I006	NEW LIMA								
67	SEMINOLE	I007	VARNUM								
67	SEMINOLE	I010	SASAKWA								
67	SEMINOLE	I014	STROTHER								
67	SEMINOLE	I015	BUTNER			90.94%	90.94%	90.24%			
68	SEQUOYAH	C001	LIBERTY								
68	SEQUOYAH	C035	MARBLE CITY								
68	SEQUOYAH	C036	BRUSHY					87.34%	90.68%		
68	SEQUOYAH	C050	BELFONTE								
68	SEQUOYAH	C068	MOFFETT								
68	SEQUOYAH	I001	SALLISAW								
68	SEQUOYAH	I002	VIAN								
68	SEQUOYAH	I003	MULDROW								
68	SEQUOYAH	I004	GANS						134.77%		
68	SEQUOYAH	I005	ROLAND						145.40%		
68	SEQUOYAH	I006	GORE								
68	SEQUOYAH	I007	CENTRAL								
69	STEPHENS	C082	GRANDVIEW								
69	STEPHENS	I001	DUNCAN					85.83%			168.69%
69	STEPHENS	I002	COMANCHE								
69	STEPHENS	I003	MARLOW								
69	STEPHENS	I015	VELMA-ALMA								
69	STEPHENS	I021	EMPIRE						94.45%		89.33%
69	STEPHENS	I034	CENTRAL HIGH								
69	STEPHENS	I042	BRAY-DOYLE								
70	TEXAS	C009	OPTIMA								
70	TEXAS	C080	STRAIGHT								
70	TEXAS	I001	YARBROUGH								
70	TEXAS	I008	GUYMON								
70	TEXAS	I015	HARDESTY								
70	TEXAS	I023	HOOKER								
70	TEXAS	I053	TYRONE							92.63%	
70	TEXAS	I060	GOODWELL								
70	TEXAS	I061	TEXHOMA								
71	TILLMAN	I008	TIPTON								
71	TILLMAN	I009	DAVIDSON								
71	TILLMAN	I158	FREDERICK								173.04%
71	TILLMAN	I249	GRANDFIELD								
72	TULSA	C015	KEYSTONE								
72	TULSA	I001	TULSA								140.99%

District who qualified for (85%) by their Est. of Needs, submitted bond election results or series bond sinking fund data

History of Districts with Bonded Indebtedness of 85% or more for Class Size

10/11/2012

County		District		Bond Year 2013 (7/1/12-6/30/13)	Bond Year 2012 (7/1/11-6/30/12)	Bond Year 2011 (7/1/10-6/30/11)	Bond Year 2010 (7/1/09-6/30/10)	Bond Year 2009 (7/1/08-6/30/09)	Bond Year 2008 (7/1/07-6/30/08)	Bond Year 2007 (7/1/06-6/30/07)	Bond Year 2006 (7/1/05-6/30/06)
72	TULSA	I002	SAND SPRINGS		111.21%	100.35%	373.01%			99.94%	100.33%
72	TULSA	I003	BROKEN ARROW		105.60%	97.54%	96.27%	105.98%		97.43%	101.85%
72	TULSA	I004	BIXBY		140.70%	85.22%	90.19%	89.29%			
72	TULSA	I005	JENKS		107.54%	109.30%	107.74%	109.03%		105.37%	
72	TULSA	I006	COLLINSVILLE						240.45%		172.10%
72	TULSA	I007	SKIATOOK							159.91%	
72	TULSA	I008	SPERRY								167.47%
72	TULSA	I009	UNION		103.51%	97.53%	89.47%	85.14%			
72	TULSA	I010	BERRYHILL			86.09%		399.99%			
72	TULSA	I011	OWASSO			88.70%	130.17%				
72	TULSA	I013	GLENPOOL				477.72%		123.50%		
72	TULSA	I014	LIBERTY					91.02%			86.15%
73	WAGONER	I001	OKAY								
73	WAGONER	I017	COWETA								
73	WAGONER	I019	WAGONER								
73	WAGONER	I365	PORTER-CONSOLIDATED						374.14%		
74	WASHINGTON	I004	COPAN					91.28%		88.01%	
74	WASHINGTON	I007	DEWEY				86.10%	93.23%			
74	WASHINGTON	I018	CANEY VALLEY								
74	WASHINGTON	I030	BARTLESVILLE		119.76%	113.06%	93.29%	89.03%		95.22%	90.47%
75	WASHITA	I001	SENTINEL								
75	WASHITA	I010	BURNS FLAT-DILL CITY								
75	WASHITA	I011	CANUTE								
75	WASHITA	I078	CORDELL					180.88%			
76	WOODS	I001	ALVA								
76	WOODS	I003	WAYNOKA							98.06%	
76	WOODS	I006	FREEDOM								
77	WOODWARD	I001	WOODWARD				95.85%		222.41%		
77	WOODWARD	I002	MOORELAND								
77	WOODWARD	I003	SHARON-MUTUAL								
77	WOODWARD	I005	FORT SUPPLY								
521				1	28	39	60	58	36	60	61
* Series Bond - calculated per sinking fund & issues still pending											
62C020 Pickett-Center annexed into 62I009 Vanoss effective July 1, 2011.											
62	PONTOTOC	C020	PICKETT-CENTER			89.21%	93.36%				

StateNotes

Class Size

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State Policies Focusing on Class-size Reduction

Updated by Kyle Zinth
September 2009

Twenty-three states currently have policies addressing class-size reductions to a level below 20 students per classroom. The majority of these policies target students in the elementary grades, with the K-3rd grade range being especially popular. Fifteen states specifically focus policies on students in grades K-3. The remaining listed states either all include at least some grades in the K-3 range within their policies, but either extend the grades upward or begin at preschool.

Following the summary chart below is a brief primer on the rationale behind and evidence for the effectiveness of class-size reduction.

These policies are not synonymous with class-size limitation policies that exist in most states. Those policies establish maximum class sizes, and will be examined in a future StateNote. Corrections and additions to policies listed here are welcome.

State	Category (Type)	Description	Notes	Funding	Average Elementary School Class Size	
					1999-2000[1]	2003-04[2]
Alabama	Mandate ALA. ADMIN. CODE R. 290-5-1-.01	Targets K-3rd grades. State board resolution[3] sets a timetable and limits to 18 students per teacher		Through the 1995 Foundation Program Plan	18.7	18.4
California	Voluntary CAL. EDUC. CODE § 52120-52128.5	Targets K-3rd grades. Legislation authorized formation of smaller classes and provided funding for those schools choosing to do so.	CAL. EDUC. CODE § 52128 mandated independent evaluation. Report is currently available	Schools may apply for funds under one of two options. Under option one, a school district that provides a reduced class size for all pupils in each classroom for the full regular school day for each grade level may receive an apportionment equal to	22.7	21.7

State	Category (Type)	Description	Notes	Funding	Average Elementary School Class Size	
					1999-2000[1]	2003-04[2]
		Initial targets: 20 in K-3.	online.[4]	$800 per pupil. Under option two, a school district that provides a reduced class size for all pupils in each classroom for at least half of the instructional minutes offered per day at each grade level may receive an apportionment equal to $400 per pupil.		
Connecticut	Voluntary/Grant CONN. GEN. STAT. § 10-265F	Targets K-3rd grades. Designed in part to enable the reduction of K-3 class-size to no more than 18 in core curriculum classes in schools within a "priority" districts.	Grants allocated: 1. To establish full-day kindergarten 2. To reduce class size in grades K-3 3. To establish intensive early intervention reading programs. Schools may receive a grant for one or more of the listed purposes.	Eligible districts may apply to the state for funding through a competitive grant process. Statute dictates that funds available for this program in the fiscal year ending June 30, 2009 be in the amount of $1.8 million. Eligible districts may also qualify for additional funds for applicable facilities expenditures. (CONN. GEN. STAT. § 285a. § 285d.)	20	19.5
Florida	Mandate FLA. CONST. ART. 9 § 1, FLA. STAT. ANN. § 1003.03, § 1002.55 (applies to private pre-k programs)	Targets P-3rd grades. State constitution stipulates that by the beginning of the 2010 school year, the maximum number of students assigned to each teacher for P-3rd grade is 18. Ratio for 4th-8th grades is no more than 22 students.	Voters approved an initiative in 2002 to amend the Florida constitution in order to provide funding to decrease class sizes.	Specific operating categorical fund for class-size reduction (FLA. STAT. ANN. § 1011.685). The class size reduction lottery revenue bond program exists to fund program (FLA. STAT. ANN. § 1013.737). Classrooms for Kids program may be used for facilities upgrades or purchases in order to reduce class size (FLA. STAT. ANN. § 1013.735).	23.1	21.2
Georgia	Mandate GA. CODE ANN. § 20-2-161 GA. CODE ANN. § 20-2-182	Class sizes are funded as follows: • Kindergarten: 16 • Kindergarten Early Intervention: 11 • 1st-3rd grades: 17 • 1st-3rd grades Early Intervention: 11 • 4th-5th grades early intervention: 11	Due to an "unforeseen and unprecedented downturn in Georgia's Economy," for the 2009-10 school year, class-size limits were increased by two students per class.[5]	Through funding formula	19.7	17.8
Illinois	Voluntary/Grants	Targets K-3rd grades.	Eligibility limited to districts with	Grants		

State	Category (Type)	Description	Notes	Funding	Average Elementary School Class Size	
					1999-2000[1]	2003–04[2]
	105 ILL. COMP. STAT. 5/2-3.134(a), ILL. ADM. CODE TIT. 23, § 565.10 - § 565.60	Limits classes to no more than 20 students per teacher.	schools serving K-3rd grades that are on the academic warning list or the academic watch list.		22.3	22.9
	Voluntary/Pilot/Grants 105 ILL. COMP. STAT. 5/2-3.134(b), ILL. ADM. CODE TIT. 23, § 565.110 - § 565.160	Targets K-3rd grades. Limits classes to no more than 15 students per teacher.	Eligibility limited to districts with schools serving K-3rd grades that are on the academic warning list or the academic watch list	Grants		
Indiana	Voluntary/Pilot IND. CODE § 21-43-9-1 - § 21-43-9-11	Targets K-3rd grades. Primetime Program Specifies a target of between 15-18 students per class.		Through funding formula determined by factoring in the school's at-risk index and amount of tuition support.	21.4	21.3
Iowa	Mandate IOWA CODE ANN. § 256D.1	Targets K-3rd grades. Provides resources to reduce class size in basic skills instruction to 17 students per teacher.	Designed to achieve a higher level of student success in the basic skills, especially reading.	Class-Size Reduction funding incorporated into state's K-12 funding formula.	20.1	20.9
Louisiana	Mandate LA. REV. STAT. ANN. § 17:174	Targets K-3rd grades. Classes not to exceed 20 unless authorized in writing by the state superintendent	No provision of this measure can take effect until funds appropriated specifically by the legislature.	Students above the maximum not to be counted for funding purposes.	18.9	18.7
Maine	Voluntary ME. REV. STAT. ANN.TIT. 20-A, § 4252	Targets K-3rd grades. Enables local units to limit class size within one or more grades. Recommendation of 15 to 1, with a maximum of 18 to 1.	Authorizes a number of policies that districts may implement with state support.	Allowable reimbursable cost	18	17.1
Minnesota	Mandatory MINN. STAT. ANN. § 126C.12	Targets K-3rd grades. Requires districts to expend funds to keep average class size at 17.		State learning and development revenue distributed according to funding formula.	22	22.3
Montana	Mandatory	Targets K-2nd grades.		Does not specify	18.2	18.1

State	Category (Type)	Description	Notes	Funding	Average Elementary School Class Size	
					1999-2000[1]	2003-04[2]
	MONT. ADMIN. R. 10.55.712	Limits class sizes to no more than 20 students.				
Nevada	Mandate NEV. REV. STAT. § 388.700	Targets K-3rd grades. Legislature limited teacher/student ratio in K-3rd grades to15 in core subjects.	Directs school districts and licensed personnel associations to develop plans to reduce class sizes in grades 1-3 within limits of available financial support. Districts allowed to apply for and receive waivers to policy.	Does not specify	20.7	22.6
Ohio	Voluntary OHIO REV. CODE ANN. § 3317.02.09	Targets K-2nd grades. Enables a district to modify or purchase classroom space to reduce class size with a goal of attaining class sizes of 15 students per licensed teacher.	The district must certify its need for additional space to the department, in a manner satisfactory to the department.	State funding formula	22.7	20.3
Oklahoma	Mandate OKLA. STAT. TIT. 70, § 18-113.1, § 18-113.2, § 18-113.3	Targets 1st-6th grades. No more than 20 students may be regularly assigned to a teacher.	Districts can face fiscal penalties for failure to compiy. Districts can avoid penalties if classrooms are not available and district meets certain guidelines (has maximum millage allowable or voted indebtedness within five prior years).	Funding is addressed through foundation program.	18.6	19.9
Pennsylvania	Voluntary/Grants PA. CONS. STAT. ANN. § 25-2599.2	Targets K-3rd grades. Supports programs to limit class sizes to 17 students or two teachers for every 35 students	Grants may support various allowable uses, including the establishment, maintenance or expansion of a class size reduction program.	Through state "accountability grants" meant to be used by districts to "to attain or maintain academic performance targets."	22.2	20.6
Rhode Island	Voluntary/Grants R.I. GEN. LAWS § 16-67-2	Targets K-3rd grades. Encourages districts to reduce class size to no more than 15 in grades K-3.		Educational improvement block grants (R.I. Gen. Laws § 16-67-4(2), § 16-5-31)	20	19.6

State	Category (Type)	Description	Notes	Funding	Average Elementary School Class Size	
					1999-2000[1]	2003-04[2]
South Carolina	Voluntary S.C. CODE ANN. § 59-63-65.	Targets 1st-3rd grades. Provides funds to districts choosing to reduce class size to 15.	Districts choosing to implement the reduced class size must track the students served in classes with a 15:1 ratio for three years so that the impact of smaller class size can be evaluated.	Funds are provided by the General Assembly to support purpose of this policy.	17.9	18.5
South Dakota	Voluntary/Grants S.D. CODIFIED LAWS § 13-14-8.1	Targets K-3rd grades. Provides incentives for reducing class sizes in to 15 or less.		Youth-at-risk grants funds Grants for up to three years.	18.8	17.8
Tennessee	Pilot TENN. CODE ANN. § 49-6-3501	Targets K-3rd grades. Demonstration centers (operated by local boards) established with class maximum enrollment of 17. Two hundred teaching positions were funded by the department of education.	Program was a pilot and is no longer active. Included in this chart due to its influence on later policy in other states.	All but 5% of costs paid by the department of education.	19.7	19
Texas	Mandate TEX. EDUC. CODE ANN. § 25.112	Targets K-4th grades. Districts may not enroll more than 22 students in a class.	The commissioner may grant exceptions if "the limit works an undue hardship on the district." A campus or district that is granted an exception must provide written notice of the exception to the parent of or person standing in parental relation to each student affected by the exception. (TEX. EDUC. CODE ANN. § 25.113)	Does not specify.	18.5	18.7
Utah	Mandate UTAH CODE ANN. § 53A-17a-124.5	Emphasis on K-2nd grades. Requires districts to reduce class size in grades K-8, with emphasis on K-2. Must use 50% of funds allocated for this purpose to reduce class size in K-2, with emphasis on improving reading skills.	20% of district's allocation may be used for capital facilities projects that will help to reduce class size.	Funding determined through use of weighted pupil units. The budgeted state contribution, for the 2008-09 fiscal year, toward the class size reduction program is $90,537,741. (UTAH CODE ANN. § 53A-17a-104)	23.7	24.3

State	Category (Type)	Description	Notes	Funding	Average Elementary School Class Size	
					1999-2000[1]	2003–04[2]
		If average class size is below 18 in K-2, may petition the state board for waiver to use its allocation for reduction in other grades.				
Washington	Voluntary WASH. REV. CODE ANN. § 28A.630.055	Targets K-3rd grades. Support for class sizes at a ratio of one teacher to 16.	Authorizes four demonstration projects to develop, implement and document the effects of a comprehensive K-3 foundations program. Policy directs the office of the superintendent of public instruction to contract with the Northwest Regional Educational Laboratory to conduct an evaluation of the demonstration projects.	State grants are provided to approved applicants.		
	Voluntary WASH. REV. CODE ANN. § 28A.505.210, Initiative 728 (2000)	Targets K-4th grades. Provides funds to districts in order to reduce class size in K-4th grades.	In 2000, voters approved initiative 728, which became effective in 2001. The initiative stated that "the state's long-term goal should be to reduce class size in grades K-4 to no more than eighteen students per teacher in a class." Funds may be used for other purposes spelled out in the policy, including extended learning opportunities or teacher professional development.	State-administered Student Achievement Fund	23.9	21.9
Wisconsin	Voluntary/ Grants WIS. STAT. ANN. § 118.43	Targets K-3rd grades Student Achievement Guarantee in Education (SAGE). Provides financing to schools to reduce class size to 15.	Districts enter into five-year achievement guarantee contacts with the department of public instruction. Schools receiving preschool through 5th grade grants provided for in WIS. STAT. ANN. § 115.45 are not eligible for the program.	Finance formula. Schools receive state aid equal to $2,250 for each low-income K-3 child[6].	20.8	19.5

State	Category (Type)	Description	Notes	Funding	Average Elementary School Class Size	
					1999-2000[1]	2003-04[2]
			Class size reduction is one of several requirements for the grants to be eligible for annual renewal.			

Small Class Sizes: Discussion, Rationale, Evidence

The debate over the effectiveness and efficiency of reducing class size remains unresolved.

Researchers keep the discussion alive as they argue about the merits and methodologies of various class-size studies. For state policymakers, reducing class size is a visible, concrete initiative that can be replicated throughout schools. Meanwhile, teachers and parents proclaim what they see as obvious — fewer students in a class make it easier to teach and to learn. In the end, state leaders must weigh the "political points" they earn from teachers and parents against the high cost of reducing class size and the education reforms left unfunded because of this policy.

The class-size reduction discussion intensified in 1990 when the Tennessee legislature funded a longitudinal study on smaller classes and student achievement, and then commissioned a follow-up study to determine the lasting benefits. The first study, known as Project STAR (Student Teacher Achievement Ratio) studied 7,000 students in 79 elementary schools. Researchers concluded that small class sizes (13-17 students) significantly increased student achievement scores, compared to regular classes of 22 to 25 and regular classes with a full-time teacher's aide. They also found that gains made in kindergarten were maintained through 3rd grade and the greatest gains were made in inner-city small classes.

Tennessee's second analysis, the Lasting Benefits Study, tracked students from grades 4-7 as they returned to normal size classes and concluded these students:

- Were less frequently retained in grade
- Succeeded in narrowing the achievement gap between children living in poverty and more affluent students, and between white and African-American students
- Had higher achievement "across the board" (in science, social studies, math, reading, spelling and study skills)
- Continued to outscore peers from larger classes; however, differences diminished somewhat as years went on.

While the results from these two studies appear convincing, critics point out that 1,100 small-class size studies produced mixed findings. They also question whether Project STAR and the Lasting Benefits Study should be viewed as the definitive studies on which to develop and invest in class-size reduction policies.

Overall, most experts agree that the evidence is inconclusive as to whether small classes improve student achievement. The research has produced mixed and contradictory results, including:

- Students in early grades learn more and continue to have an edge over the rest of their peers when they return to normal classrooms. The impact is greatest and longer-lasting if they remain in small classes, however.
- The payoff in terms of student achievement gains does not translate into a cost-effective investment. Tutoring and direct instruction appear to be more cost-effective.
- Kindergarten through 3rd-grade students benefit most, as do minority students in urban schools.
- Class-size reduction cannot be isolated as the sole factor for increased student achievement.
- Reading and math scores improve for some students in comparison to peers in regular-size classes.
- Smaller classes force districts to hire significantly more teachers and create more classroom space.
- Effectiveness depends on whether teachers adapt their teaching methods to take advantage of small classes and have more focused time with students.
- Small classes result in fewer classroom distractions and more time for teachers to devote to each student

Characteristics of High-Quality Initiatives

Reducing class size is most effective when:

- Classes are reduced to between 15 and 19 students (Little impact has been demonstrated in class sizes of 20 to 40 students.)
- Particular schools are targeted, especially those with low-achieving and low-income students
- Teachers are provided ongoing, high-quality professional development to make the most of the smaller class size conditions
- Teachers are well-qualified and a challenging curriculum is used for every student.

Actions for Policymakers

If state policymakers decide to invest in class-size reduction, they may want to consider the following actions:

- Estimate the cost of funding the proposed class-size reduction plan, then:
    - Determine the state's commitment and any district contribution that will be necessary
    - Indicate whether state funding is permanent, temporary or contingent upon available revenue
    - Address the need for additional, qualified teachers and classroom space
    - Provide sufficient funds for the grades and schools covered under the initiative.
- Target the program and dollars to low-income, low-achieving schools to allow significant class-size reduction in a few schools, rather than modest reductions statewide.

- Provide professional development funds so teachers can adapt their teaching methods for the smaller classes.
- Evaluate the small class-size initiative on a regular basis to determine its benefits and cost-effectiveness.
- Assist schools and districts to combine class-size reduction with other school-improvement plans for maximum impact.

Comments to Policymakers

As more states adopt or consider legislation to reduce class size, the discussion should focus on the costs of creating smaller classes and whether the costs are justified by the returns. Moreover, if class size is believed to make a difference, then policymakers need better information about why small classes are beneficial to student achievement and how this information can be used for other reform efforts. Finally, state leaders should be prepared to deal with the unintended consequences if class size is reduced on a statewide scale; for example, the need for additional, qualified teachers and classroom space and the issue of teachers choosing more desirable districts.

Suggestions for Evaluation: California Example

The following was adapted from *Report to the State Board of Education: A Plan for the Evaluation of California's Class Size Reduction Initiative* 10/20/97.

QUESTIONS TO ASK ABOUT THE IMPACT OF THE CLASS SIZE REDUCTION PROGRAM

The Class Size Reduction program (CSR) consortium proposed a research plan to find information on many topics, broken into seven categories. The answers to some of these questions will come from data (test scores, for example), while many others will require observations, surveys, and conversations with policymakers, teachers and administrators, and parents.

Policymaking at the state, district and school levels

- What are policymakers' goals and expectation for CSR? Their concerns?
- Do they have common expectations about the influence on student learning? Do these match or differ from teachers' or school boards' expectations.
- How do educational policies, regulations and labor agreements help or hinder implementation?

Resource allocation within and among schools

- What is the effect on districts' revenues and expenditures? On spending for school operations and facilities, across grades, for instructional support services and programs? On resources across primary and secondary schools and across district programs?
- How did schools find space for new classrooms? If there were tradeoffs, what were they and are they permanent?
- How does CSR money affect equity of funding among districts, schools and groups of students given the different resources already available to districts?

Intersection with other education reforms

- What is the relationship between CSR and large categorical programs (Special Education, Title 1) and programs for English learners?
- Do district or school characteristics (high or low revenue, for example) affect implementation?

- Is CSR integrated with a district's master plan or existing reform efforts? What interaction, if any, will there be with new state curriculum standards?
- Does CSR intersect with other reform efforts, or is it a diversion?

Teacher quality, assignment and training

- What is the impact of CSR on recruiting and assigning teachers? What is the influence of collective bargaining?
- What are the qualifications and experience of teachers in the smaller classes and in classes with limited-English or minority or special-needs students?
- What professional development and support do teachers get? Does it change according to their experience? Does it vary by district?
- What do teachers report about their satisfaction and attitudes as a consequence of CSR? How do these affect student learning?

Classroom practices

- How has CSR affected teaching practices?
- What methods of instruction are used for English language learners in CSR classes? Does instruction differ across districts, classrooms or categories of students?
- How is the classroom atmosphere changed?
- What is the impact on personnel to support teachers?

Student outcomes

- Has achievement in reading and math improved? Has promotion, retention changed? What do the next grade teachers report?
- Have transitions into or out of special programs changed?
- What is the impact on students' attendance, behavior, completing homework?
- Are English language learners ready to read sooner?
- Do student outcomes vary according to school, teacher, classroom practices or the characteristics of the student?
- Have changes in classroom practices affected student outcomes?

Parental involvement

- How have parents been involved in decisions about participation, allocation of resources and space, and pupil assignments?
- Are parents more directly involved with their child's teacher or in the classroom?
- Do parents believe their children's education is improved? Is there a change in their satisfaction with teachers, the school, or the district? Do they think the total school program has improved?
- Have parent involvement programs grown or declined? Parent participation?

This last segment used with permission: EdSource, *Evaluating California's Class Size Reduction Program*, February 1998. To order the evaluation, send $4 plus $1 shipping and handling to: EdSource, 4151 Middlefield Road, Suite 100, Palo Alto, CA 94303-4743. 650/857-9604, phone 650/857-9618 fax; www.edsource.org

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California Department of Education, *What Have We Learned About Classroom Reduction in California?* Sacramento, CA: California Department of Education, September 2002.

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[1] National Center for Education Statistics. Average Elementary School Class Size, Washington, D.C.: NCES, May 2002; School and Staffing Survey, 1999-2000: Overview of the Data for Public, Private, Public Charter, and Bureau of Indian Affairs Elementary and Secondary Schools (Table 1.16 "Average class size for teachers in self-contained classes"). Washington, D.C.: NCES, May 2002, http://nces.ed.gov/pubs2002/2002313.pdf.

[2] National Center for Education Statistics, Digest of Education Statistics, Highest degree earned, years of full-time teaching experience, and average class size for teachers in public elementary and secondary schools, by state: 2003–04 http://nces.ed.gov/programs/digest/d08/tables/dt08_067.asp (Accessed June 4, 2009).

[3] Alabama Board of Education Resolution, September 11, 1997, http://www.alsde.edu/html/boe_resolutions2.asp?id=481.

[4] *What We Have Learned About Class Size Reduction in California,* CSR Research Consortium, September 2002, http://www.classize.org/techreport/CSRYear4_final.pdf.

[5] Georgia Department of Education Class Size Exemption Recommendations Effective for the 2009-2010 School Year Only, January 2008, http://www.gadoe.org/DMGetDocument.aspx/GaDOE%20Waiver%20Request%20Letter%20and%20Information.pdf?p=6CC6799F8C1371F6D75E81A462FB23085752B797FE849F24CE0C64A73399F083&Type=D (Accessed July 31, 2009).

[6] Student Achievement Guarantee in Education (SAGE) Program, Wisconsin Department of Public Instruction Web site http://dpi.wi.gov/sage/index.html, (Accessed August 27, 2009)

Kyle Zinth, policy analyst in the ECS Information Clearinghouse, updated this report. E-mail Kyle at kzinth@ecs.org

Helping State Leaders Shape Education Policy

BROWN CENTER on
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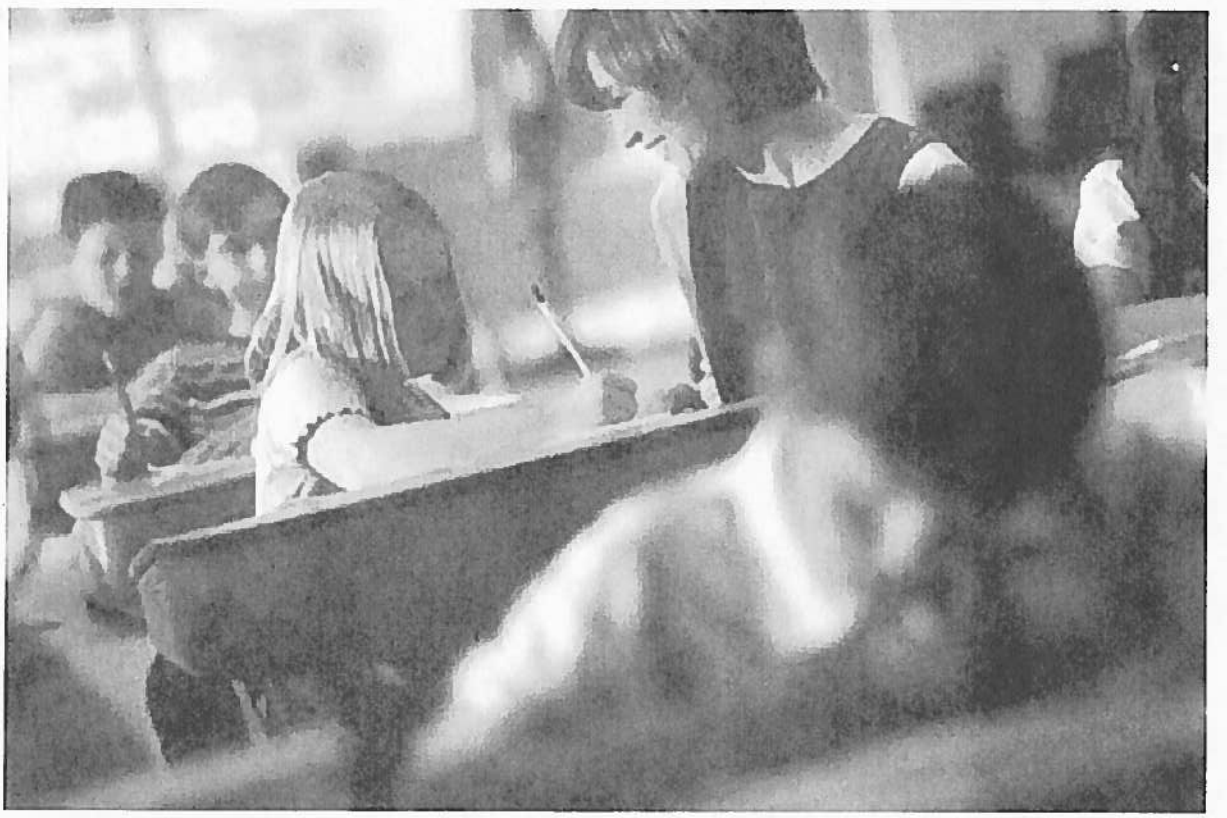
May 11, 2011

Class Size: What Research Says and What it Means for State Policy



Bruce Ayres

Grover J. "Russ" Whitehurst and
Matthew M. Chingos

EXECUTIVE SUMMARY

Class size is one of the small number of variables in American K-12 education that are both thought to influence student learning and are subject to legislative action. Legislative mandates on maximum class size have been very popular at the state level. In recent decades, at least 24 states have mandated or incentivized class-size reduction (CSR).

The current fiscal environment has forced states and districts to rethink their CSR policies given the high cost of maintaining small classes. For example, increasing the pupil/teacher ratio in the U.S. by one student would save at least $12 billion per year in teacher salary costs alone, which is roughly equivalent to the outlays of Title I of the Elementary and Secondary Education Act, the federal government's largest single K-12 education program.

The substantial expenditures required to sustain smaller classes are justified by the belief that smaller classes increase student learning. We examine "what the research says" about whether class-size reduction has a positive impact on student learning and, if it does, by how much, for whom, and under what circumstances. Despite there being a large literature on class-size effects on academic achievement, only a few studies are of high enough quality and sufficiently relevant to be given credence as a basis for legislative action.

The most influential and credible study of CSR is the Student Teacher Achievement Ratio, or STAR, study which was conducted in Tennessee during the late 1980s. In this study, students and teachers were randomly assigned to a small class, with an average of 15 students, or a regular class, with an average of 22 students. This large reduction in class size (7 students, or 32 percent) was found to increase student achievement by an amount equivalent to about 3 additional months of schooling four years later.

Studies of class size in Texas and Israel also found benefits of smaller classes, although the gains associated with smaller classes were smaller in magnitude than those in the Tennessee STAR study. Other rigorous studies have found mixed effects in California and in other countries, and no effects in Florida and Connecticut.

Because the pool of credible studies is small and the individual studies differ in the setting, method, grades, and magnitude of class size variation that is studied, conclusions have to be tentative. But it appears that very large class-size reductions, on the order of magnitude of 7-10 fewer students per class, can have significant long-term effects on student achievement and other meaningful outcomes. These effects seem to be largest when introduced in the earliest grades, and for students from less advantaged family backgrounds.

When school finances are limited, the cost-benefit test any educational policy must pass is not "Does this policy have any positive effect?" but rather "Is this policy the most productive use of these educational dollars?" Assuming even the largest class-size effects, such as the STAR results, class-size mandates must still be considered in the context of alternative uses of tax dollars for

Grover J. Whitehurst is director of the Brown Center on American Education and a senior fellow in Governance Studies at the Brookings Institution.

Matthew M. Chingos is a fellow in the Brown Center on Education Policy at the Brookings Institution.

education. There is no research from the U.S. that directly compares CSR to specific alternative investments, but one careful analysis of several educational interventions found CSR to be the least cost effective of those studied.

The popularity of class-size reduction may make it difficult for policymakers to increase class size across the board in order to sustain other investments in education during a period of budget reductions. In that context, state policymakers should consider targeting CSR at students who have been shown to benefit the most: disadvantaged students in the early grades, or providing a certain amount of funding for CSR but leaving it up to local school leaders on how to distribute it.

In settings where state mandates on maximum class size are relaxed, policymakers need to bear in mind that the effect of any increase in class size will depend on how such an increase is implemented. For example, a one-student increase in the pupil/teacher ratio in the U.S. would reduce the teaching workforce by about 7 percent. If the teachers to be laid off were chosen in a way largely unrelated to their effectiveness, such as seniority-based layoffs, then the associated increase in class size might well have a negative effect on student achievement. But if schools choose the least effective teachers to let go, then the effect of increased teacher quality could make up for some or all of the possible negative impact of increasing class size.

State resources for education should always be carefully allocated, but the need to judiciously weigh costs and benefits is particularly salient in times of austere budgets. Class-size reduction has been shown to work for some students in some grades in some states and countries, but its impact has been found to be mixed or not discernable in other settings and circumstances that seem similar. It is very expensive. The costs and benefits of class-size mandates need to be carefully weighed against all of the alternatives when difficult decisions must be made.

A Context for Linking Research to Policy

There are a small number of variables in American K-12 education that are both thought to influence student learning and are subject to legislative action. Class size is one. Others include human resource policies, funding levels, curriculum, days/hours of instruction, and testing and accountability. Advocates for legislation on any of these topics are likely to appeal to research evidence as support for their position. That is appropriate and desirable as long as: a) the evidence is of high quality, b) it is relevant to the legislative action under consideration, c) conflicting evidence isn't ignored, and d) alternative courses of legislative action are similarly evaluated and compared.

The absence of any of these four conditions undermines the legitimacy of advocacy that is built on assertions about what "research says." If the evidence is not of high quality it provides little or no support for any conclusions. For

instance, advocates for class-size reduction might cite evidence that students in smaller classes perform better on state examinations. But this simple correlation could be due to families with higher levels of education living in more affluent school districts that can afford smaller classes. Class size per se might have no more to do with student achievement than the condition of the schools' sports stadiums. "Evidence" that is this weak is no evidence at all.

Research can be of high quality but of questionable relevance to legislative action because the settings and circumstances of the research are so different from those at hand. For example, a number of well-designed studies of class size in the U.S. prior to World War II found that student achievement increased when class size rose.[1] But the nature of the population, the organization of schools, the characteristics of teachers and so many other things differ between now and the U.S. between the two world wars that the relevance of this research for current legislation is weak.

Considering the balance of the evidence is also very important. Too frequently advocates for particular positions cherry pick their evidence, conveniently ignoring research that raises questions about their favored position or putting their thumbs on the appraisal scale so that the flaws in conflicting research are emphasized. Advocates for and against class-size reduction have engaged in or been accused of engaging in such cherry picking for as long as there has been research on this issue and the prospect of legislation.[2]

Finally, and most importantly, all legislative action that requires appropriations involves choices. An appeal to evidence to support expenditures without consideration of the costs and benefits of all the options that are available can seriously mislead. With a limited and currently shrinking pool of state funds available to support K-12 education, the relative productivity of expenditures should be carefully considered. What are the costs and benefits of maintaining a cap on class size relative to other state-mandated uses of funds for education? And what are the costs and benefits of state mandates on specific uses of education funds relative to appropriations that allow more flexibility at the local level in how funds are spent?

Background on Class-size Reduction

Legislative mandates on maximum class size have been very popular at the state level. In recent decades, at least 24 states have mandated or incentivized

[1] Jonah Rockoff, "Field Experiments in Class Size from the Early Twentieth Century," *Journal of Economic Perspectives*, 23(4): 211–230 (2009).

[2] See, e.g, Eric A. Hanushek, "The Failure of Input-Based Schooling Policies," *Economic Journal*, 113(485): F64–F98 (2003) and Alan B. Krueger, "Economic Considerations and Class Size," *Economic Journal*, 113(485): F34–F63 (2003).

class-size limits in their public schools.[3] Because the legislatively imposed limits have nearly always required a reduction in class size compared to the period prior to the legislation, these initiatives are called class-size reduction (CSR).

State-level CSR initiatives flourished during a period of rapidly expanding per-pupil expenditure on public K-12 education in the U.S. (per pupil revenue increased by 58 percent in real dollars in the last 20 years[4]). Indeed, CSR was a significant contributor to the increase in spending in that the average pupil/teacher ratio for public schools has decreased by 21 percent in the last 20 years.[5,6]

The average U.S. pupil/teacher ratio in the public schools is currently 15.3.[7] With an average U.S. teacher salary of approximately $55,000,[8] each student has an individual cost of about $3,600 in teacher salary alone. With about 49.3 million public school students enrolled, a one-student decrease in class size from the present average would cost over $12 billion a year in aggregate for the U.S.[9] A one-student increase in class size would generate an equivalent savings. The costs of CSR are not limited to teacher salaries. More classrooms are needed for smaller classes. In our example of a one-student reduction in class size across the U.S., more than 225,000 additional classrooms would need to be added to the nation's stock. In any context $12+ billion a year for any educational initiative is a large amount. By way of comparison, the federal government's largest single K-12 education program, Title I of the Elementary and Secondary Education Act, involves about the same level of annual expenditure as would a one-student reduction in the nation's average pupil/teacher ratio.[10]

With the end of federal stimulus funding and economic growth at low rates, 40 states are projecting shortfalls for their 2012 budget year. Some, including

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[3] Education Commission of the States, "State Class-Size Reduction Measures," Denver, Colorado: Education Commission of the States (2005).

[4] http://nces.ed.gov/edfin/tables/tab_public_effort_show.asp?referrer=edfin

[5] http://nces.ed.gov/programs/digest/d09/tables/dt09_064.asp

[6] Note that the pupil/teacher ratio is nearly always smaller than class size because it includes teachers in specialized roles as well as regular classroom teachers. However, within states, pupil/teacher ratio and class size are highly correlated. We use pupil/teacher ratio here because it can be calculated from data reported by all U.S. school districts to the federal government, whereas class size cannot.

[7] http://nces.ed.gov/programs/digest/d10/tables/dt10_068.asp

[8] http://nces.ed.gov/programs/digest/d10/tables/dt10_083.asp

[9] Presently there are 3.2 million teachers serving 49.3 million students in the public schools, which corresponds to 15.3 students for every teacher. Decreasing the pupil/teacher ratio to 14.3 would require hiring 226,000 additional teachers, which at $55,000 per teacher would cost $12.4 billion/year in salary costs alone.

[10] These per-pupil cost estimates are very conservative compared to others in the literature that try to account for all costs of teachers, including fringe benefits and facilities. See, e.g., Douglas N. Harris, "Toward Policy-Relevant Benchmarks for Interpreting Effect Sizes: Combining Effects With Costs," *Educational Evaluation and Policy Analysis* 31(1): 3–29 (2009).

large states such as California, Texas, and Illinois, are projecting revenue shortfalls that are more than 20 percent of the size of the 2011 budgets.[11] For these states, there is no single solution. Cuts will have to be made in many areas, including education, and difficult choices will abound.

In this context, we believe it is useful to revisit research on the effects of class size on student learning, and to explore what the findings from that research have to contribute to the budget deliberations that many state legislatures are presently or will shortly be engaged in. Does class-size reduction have a positive impact on student learning? If so, by how much, for whom, and under what circumstances? What would be the likely effect of relaxing class-size mandates? What are the uncertainties in the conclusions that can be drawn from existing evidence about state CSR policies?

Research on Class Size

There is a large body of research on the relationship between class size and student learning. A 1979 systematic review of the literature identified 80 studies.[12] There are surely hundreds today. The vast majority of these studies simply examine the association between variation in class size and student achievement. The primary difficulty in interpreting this research is that schools with different class sizes likely differ in many other, difficult-to-observe ways. For example, more affluent schools are more likely to have the resources needed to provide smaller classes, which would create the illusion that smaller classes are better when in fact family characteristics were the real reason. Alternatively, a school that serves many students with behavior problems may find it easier to manage these students in smaller classes. A comparison of such schools to other schools might give the appearance that small classes produce less learning when in fact the behavior problems were the main factor.

The most credible studies of CSR have utilized either randomized experiments, in which students and teachers are randomly assigned to smaller or larger classes; natural experiments in which, for example, a sudden change in class size policy allows a before-and-after analysis of its effects; or sophisticated mathematical models for estimating effects that take advantage of longitudinal data on individual students, teachers, and schools. We limit our review to such studies.

Research that supports the effectiveness of smaller classes

The most influential and credible study of CSR is the Student Teacher Achievement Ratio, or STAR, study which was conducted in Tennessee during

[11] http://www.usnews.com/news/articles/2011/01/14/10-states-with-the-largest-budget-shortfalls

[12] Gene V. Glass and Mary Lee Smith. "Meta-Analysis of Research on Class Size and Achievement." *Educational Evaluation and Policy Analysis* 1(1): 2–16 (1979).

the late 1980s. Beginning with the entering kindergarteners in 1985, students and teachers were randomly assigned to a small class, with an average of 15 students, or a regular class, with an average of 22 students. Thus the reduction in class size (7 students, or 32 percent) was quite large. There are several research studies based on the STAR experiment. We examine two, including one that focuses on longer-term outcomes.

Krueger's analysis of the Tennessee STAR experiment finds that elementary school students randomly assigned to small classes outperformed their classmates who were assigned to regular classes by about 0.22 standard deviations after four years.[13] This is equivalent to students in the smaller classes having received about 3 months more schooling than the students in the regular classes.[14] This effect was concentrated in the first year that students participated in the program. In addition, the positive effects of class size were largest for black students, economically disadvantaged students, and boys.[15] Krueger estimates that the economic returns to class-size reduction in Tennessee were greater than the costs, with an internal positive rate of return of about 6 percent.

A recent long-term follow-up of STAR participants into adulthood utilized IRS tax records to investigate a range of outcomes.[16] The researchers find that students assigned to small classes at the beginning of elementary school are about 2 percentage points more likely to be enrolled in college at age 20. They did not find any evidence of an impact on incomes at age 27, but the income effects are measured with too much imprecision to warrant strong conclusions.

In summary, STAR researchers have found positive effects of early and very large class-size reductions on academic achievement in school and college attendance, with the economic benefits of the program outweighing the costs. These are important results from a very strong research design.

Rivkin, Hanushek, and Kain used a sophisticated statistical model to examine the effects of natural variation in class size in Texas in the mid-1990s.[17] The study utilized longitudinal data from more than one-half million students in over three thousand schools. The researchers found positive effects of

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[13] Alan B. Krueger, "Experimental Estimates of Education Production Functions," *Quarterly Journal of Economics*, 115(2): 497–532 (1999).

[14] The average student gains 0.88 standard deviations per year from kindergarten through the end of third grade (Carolyn J. Hill, Howard S. Bloom, Alison Rebeck Black, and Mark W. Lipsey, "Empirical Benchmarks for Interpreting Effect Sizes in Research," *Child Development Perspectives*, 2(3): 172–177 (2008)). The STAR effect size of 0.22 is 25 percent of that, which corresponds to 2.5 months of a 10-month school year.

[15] Matthew M. Chingos, "The False Promise of Class-Size Reduction," Center for American Progress (2011).

[16] Raj Chetty, John N. Friedman, Nathaniel Hilger, Emmanuel Saez, Diane Whitmore Schanzenbach, and Danny Yagan, "How Does Your Kindergarten Classroom Affect Your Earnings? Evidence from Project STAR," NBER Working Paper No. 16381, September 2010.

[17] Steven G. Rivkin, Eric A. Hanushek, and John F. Kain, "Teachers, Schools, and Academic Achievement," *Econometrica*, 73(2): 417–458 (2005).

smaller class sizes on reading and mathematics in 4th grade, a smaller but still statistically significant effect in 5th grade, and little or no effects in later grades. Because the researchers used state assessment results that were only available beginning at 4th grade, they could not estimate class-size effects for the early grades that were studied in STAR. The estimated class-size effects for 4th and 5th graders in Texas were about half the size the K-3 effects in Tennessee.

International studies also provide positive evidence for the effects of class-size reduction. Angrist and Lavy took advantage of a class-size limit in Israel of 40 students. Whenever there are more students in a grade than 40 per teacher, a teacher and classroom must be added. The effect on class size in smaller schools can be dramatic. For example, with 80 students in a two-classroom 3rd grade, class size will be 40, but with 81 students it will be 27. The researchers find positive effects of smaller fourth- and fifth-grade classes, with effect sizes that are on the lower end of the range of those found in the STAR study.[18] They do not find any effects on third-grade scores.

Studies with mixed results

In 1996, California enacted a K-3 CSR program designed to reduce class size by ten students per class, from 30 to 20, throughout the state. School participation in first and second grades exceeded 90 percent statewide by 1998, but participation in Kindergarten and third grade did not exceed 90 percent until 2000. This staggered introduction of CSR provided opportunities for researchers to study its effects. CSR created 25,000 new teaching positions in its first two years. Many of these positions were filled by teachers without certification or prior teaching experience. Other positions were filled by experienced teachers who switched grades or schools.

Jepsen and Rivkin carried out a sophisticated analysis to examine the influence of both the class-size reduction and the changes in the teacher workforce.[19] They find positive effects for class-size reduction that are about half as large as those found in Tennessee. At the same time they find that increases in the numbers of new and not-fully-certified teachers offset much of these gains. In other words, students who ended up in the classrooms of teachers new to their classrooms and grades suffered academically from the teacher's inexperience by almost the same amount as they benefited from being in a smaller class. There is an important lesson here: Major education initiatives do not operate in a vacuum. Policies designed to affect one dimension of a student's educational experience are likely to affect others as

[18] Joshua D. Angrist and Victor Lavy, "Using Maimonides' Rule to Estimate the Effect of Class Size on Scholastic Achievement," *Quarterly Journal of Economics*, 114(2): 533–575 (1999).

[19] Christopher Jepsen and Steven Rivkin, "Class Size Reduction and Student Achievement: The Potential Tradeoff between Teacher Quality and Class Size," *Journal of Human Resources*, 44(1): 223–250 (2009).

well. Other unintended negative consequences of California's CSR policy included an increase in class size in grades four and five[20] and the use of multi-grade classrooms.[21]

Woessman and West, taking advantage of differences in average class size between the 7th and 8th grades within schools, examined class-size effects on performance on international examinations in 11 countries around the world.[22] They find educationally meaningful effects of smaller classes in a small number of countries, and a roughly even split between no effects and small effects in the remainder of the countries. Interestingly, the countries in which they find educationally meaningful positive effects of smaller classes are those with low salary levels for teachers and lower than average performance on international exams. A low average salary level for teachers suggests that a country is drawing its teaching population from a relatively low level of the overall capability distribution of all its employees. Thus, the countries studied by Woessman and West seem to have taken different paths, with some opting for relatively large numbers of poorly-paid teachers who perform better in smaller classes and others having relatively fewer but better-paid teachers whose performance isn't as affected by the number of students in class. In this regard it is worth noting that the East Asian nations that perform at higher levels than the U.S. on international exams have very large class sizes.

Dee and West used a nationally representative database of students to compare the outcomes of the same eighth-grade students who had attended different size classes in different subjects. They find no overall impact of class size on test scores, i.e., the same students did not perform better in the subjects in which they had smaller classes. There was, however, a small positive effect on test scores in urban schools, and modest overall positive effects on non-cognitive skills such as student attentiveness and attitudes about learning.[23]

Studies with negative results

Arrayed against these positive and mixed findings for CSR are two credible studies that find no positive effects. Hoxby examined natural class size variation in Connecticut that was caused when natural population variation triggered a change in the number of classes in a grade in a school. For example, a small school that has 15 first-grade students in one year and 18 the next year would

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[20] David Sims, "Crowding Peter to Educate Paul: Lessons from a Class Size Reduction Externality," *Economics of Education Review*, 28: 465–473 (2009).

[21] David Sims, "A Strategic Response to Class Size Reduction: Combination Classes and Student Achievement in California," *Journal of Policy Analysis and Management*, 27(3): 457–478 (2008).

[22] Ludger Woessmann and Martin West, "Class-Size Effects in School Systems Around the World: Evidence from Between-Grade Variation in TIMSS," *European Economic Review*, 50(3): 695–736 (2006).

[23] Thomas S. Dee and Martin R. West, "The Non-Cognitive Returns to Class Size," *Education Evaluation and Policy Analysis* (forthcoming).

have a larger class during the second year. Additionally, a school that has set a class-size limit of 25 would have one second-grade class of 25 if there were 25 second-grade students but two classes of 13 if there were 26 students. Hoxby finds no relationship between class size and achievement in fourth and sixth grade (which should reflect class size in all previous grades). Hoxby does not even find class-size effects at schools that serve disproportionately large shares of disadvantaged or minority students.[24]

A recent study by Chingos systematically examined the broad and expensive Florida CSR policy. In 2002, voters approved an amendment to the Florida state constitution that set limits on the number of students in core classes (such as math, English, and science) in the state's public schools. Beginning with the 2010-2011 school year, the maximum number of students in each core class would be: 18 students through grade 3; 22 students in grades 4 through 8; and 25 students in grades 9 through 12.

In 2003, the Florida Legislature enacted a law that implemented the amendment by first requiring, from 2003-04 to 2005-06, districts to reduce their average class sizes either to the maximum for each grade grouping or by at least two students per year until they reached the maximum. Beginning in 2006-07, compliance was measured at the school level, with schools facing the same rules for their average class size that districts faced previously. Beginning in 2010-11, compliance was measured at the classroom level.

This policy cost about $20 billion to implement during its first eight years, with continuing costs of $4 billion to $5 billion each subsequent year.[25]

Taking advantage of the staggered introduction of class-size reductions over time at the district and school level, Chingos utilized a sophisticated before-and-after analysis to examine the effects of the policy on student achievement between 2004 and 2009. He finds no evidence that the Florida policy had any impact on test scores in grades 3 through 8 (state-wide assessments in math and reading were not administered in the earlier grades).[26]

Research summary

Despite there being a large literature on class-size effects on academic achievement, only a few studies are of high enough quality and sufficiently relevant to be given credence as a basis for legislative action. Because the pool

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[24] Caroline M. Hoxby, "The Effects of Class Size on Student Achievement: New Evidence from Population Variation," *Quarterly Journal of Economics*, 115(4): 1239–1285 (2000).

[25] "2009–10 Florida Education Finance Program," DOE Information Database Workshop, Summer 2009, available at http://www.fldoe.org/eias/databaseworkshop/ppt/fefp.ppt.

[26] Matthew M. Chingos, "The Impact of a Universal Class-Size Reduction Policy: Evidence from Florida's Statewide Mandate," Harvard University, Program on Education Policy and Governance Working Paper. 10-03 (2010), available at http://www.hks.harvard.edu/pepg/PDF/Papers/PEPG10-03_Chingos.pdf

of credible studies is small; the individual studies differ in the setting, method, grades, and magnitude of class size variation that is studied; and no study is without issues, including those reviewed here, conclusions have to be tentative.

It appears that very large class-size reductions, on the order of magnitude of 7-10 fewer students per class, can have meaningful long-term effects on student achievement and perhaps on non-cognitive outcomes. The academic effects seem to be largest when introduced in the earliest grades, and for students from less advantaged family backgrounds. They may also be largest in classrooms of teachers who are less well prepared and effective in the classroom.

The Tennessee STAR experiment generates the largest estimate of the payoffs of a big decrease in class size. In Krueger's cost-benefit analysis, the return to the investment in smaller class sizes in Tennessee was slightly bigger than the costs of implementing the program. In other words, it paid its way.

All other studies of CSR generate either smaller estimates of the effects of variation in class size or find no effects at all. Getting a decent sense of the size of the effect that can be expected from reducing class size is obviously important to evaluating its benefits. Few voters would support a multi-billion dollar initiative that results in improvements in student outcomes (or any other desirable outcome, such as the population's health or vehicle gas mileage) that are too small to be noticeable.

One way to roughly estimate the size of class-size effects that is consistent with the existing literature would be to assume that the effects are linear, i.e., a reduction in class size by one student would generate 10 percent of the benefit of a reduction in class size by 10 students, and to assume that the effects diminish with each grade in school, with a reduction of a given number of students in 5th grade expected to have about half the effect of reduction of the same number of students in kindergarten.

The largest estimates of the magnitude of class-size effects are those produced by Krueger (1999), who found that the students in classes that were 7 to 8 students smaller on average than regular-sized classes performed about 0.22 standard deviations better on a standardized test. This means that students performed about 3 percent of a standard deviation better for every 1 student less in the class. These effects were generated largely by class-size reductions in kindergarten. If we take the effect by 5th grade to be half the size of the kindergarten effect, then a reduction in 1 student per class would generate approximately 1.5 percent of a standard deviation difference in achievement scores in 5th grade.

This means that on a statewide assessment such as the Texas Assessment of Knowledge and Skills (TAKS), which has a mean of about 700 and a standard deviation of about 100 at 5th grade for mathematics, a reduction in class size by one student would generate an improvement of 1.5 scale score points. Thus a statewide mean of 700 on TAKS would become a statewide mean of 701.5. Alternatively, an increase of class size by one student would lead to a statewide

mean of 698.5 on TAKS. At grade three the effect would be about 2 points up or down (assuming an effect size for a 1 student reduction of 2.0, which is 2/3rds of the effect for earlier grades in STAR). To put a one or two point change in student performance as a result of class size in context, the difference between the average scale scores of whites and blacks on TAKS at 5th grade is 65 points. Note that our estimates of a one to two point effect on TAKS of a one student change in class size are based on an upper bound for class-size effects based on Krueger's analysis. Estimates that averaged together effect sizes for all the studies we have reviewed, including the two that found no effects at all (Hoxby; Chingos), would obviously be considerably smaller.

Funding Class-size Reduction vs. Other Initiatives

When school finances are limited, the cost-benefit test any educational policy must pass is not "Does this policy have any positive effect?" but rather "Is this policy the most productive use of these educational dollars?" Assuming even the largest class-size effects, such as the STAR results, class-size mandates must still be considered in the context of alternative uses of tax dollars for education. Will a dollar spent on class-size reduction generate as much return as a dollar spent on: raising teacher salaries, implementing better curriculum, strengthening early childhood programs, providing more frequent assessment results to teachers to help guide instruction, investments in educational technology, etc.?

There is no research from the U.S. that directly compares CSR to specific alternative investments. In other words, the comparison condition for all CSR studies has been business as usual rather than, for example, a comparison of $20 billion invested in smaller classes vs. $20 billion invested in higher teacher salaries. Thus, estimates of effects and costs from different education investments have to be extrapolated and estimated from different studies, and this process is necessarily inexact. Nevertheless, Harris finds short-term rates of return for computer-aided instruction, cross-age tutoring, early childhood programs, and increases in instructional time that are all greater than those for CSR.[27] Whitehurst does not estimate costs, but finds effects on student achievement from choosing more effective curriculum; reconstituting the teacher workforce (for example by substituting Teach for America teachers for new teachers from traditional training routes); and enrolling students in popular charter schools in urban areas that are all as large or larger than those obtained from CSR.[28]

The popularity of class-size reduction may make it politically difficult for

[27] Douglas N. Harris, "Toward Policy-Relevant Benchmarks for Interpreting Effect Sizes: Combining Effects With Costs," *Educational Evaluation and Policy Analysis* 31(1): 3–29 (2009).
[28] Grover J. Whitehurst. "Don't forget Curriculum," *Brown Center Letters on Education, #3*. October 2009, Washington, D.C.: The Brookings Institution.

policymakers to increase class size in order to sustain other investments in education, even in a time of budget austerity. In that context, state policymakers might consider targeting the reductions at students who have been shown to benefit the most: disadvantaged students in the early grades, or providing a certain amount of funding for CSR but leaving it up to local school leaders on how to distribute it. Much smaller classes for inexperienced teachers who need support in developing skills or for teachers who are responsible for struggling students may make more sense than across the board reductions.

The tradeoff between class size and teacher salaries needs to be very carefully considered. Effects on student achievement related to differences in teacher quality are very large. The same data from the Tennessee STAR study that demonstrates long-term effects for class-size reduction produces estimates of much larger effects for variation in teacher quality within schools. Thus, for example, while differences between large and small classes in early elementary school had no long-term effects on the earning power of adults, differences in classroom quality did.[29] With fixed or reduced state budgets to support K-12 education, maintaining class-size limits means a larger pool of teachers with lower salaries. It means that funds that might be devoted to raising teacher salaries across the board or selectively in hard to fill positions or for highly effective teachers will be limited. By one estimate, an increase in average class size by 5 students would result in an across the board increase of 34 percent in teacher salaries if all the savings were devoted to that purpose.[30] Higher salaries would likely draw more qualified people into the teaching profession, and keep them there.

In the current fiscal climate, it is clear that the yearly increases in funding in real dollars that have long been enjoyed by our nation's public schools are coming to an end for the foreseeable future. Many states and districts are contemplating cuts in funding that will require schools to make hard choices. So although the research literature has focused on the effect of reducing class size, the current policy debate concerns the other side of the coin—the consequences of increasing the size of classes. The potential for negative consequences of larger classes clearly needs to be weighed against the fallout from cutting other programs in order to preserve smaller classes—both academic programs and non-academic offerings such as athletics and the arts.

Another important point is that the effect of any increase in class size will depend on how such an increase is implemented. Our earlier rough calculation indicated that a one-student increase in the pupil/teacher ratio in the U.S., which would save over $12 billion per year in salary costs alone, would decrease the

[29] Raj Chetty, John N. Friedman, Nathaniel Hilger, Emmanuel Saez, Diane Whitmore Schanzenbach, and Danny Yagan, "How Does Your Kindergarten Classroom Affect Your Earnings? Evidence from Project STAR," NBER Working Paper No. 16381, September 2010.
[30] Matthew M. Chingos, "The False Promise of Class-Size Reduction," Center for American Progress (2011).

teaching workforce by about 7 percent of the nation's teachers. Many school districts and states across the nation are considering reductions in the teacher workforce on this order of magnitude. If the teachers to be laid off were chosen in a way largely unrelated to their effectiveness, such as "last in first out," then the associated increase in class size could well have a negative effect on student achievement. But if schools choose the least effective teachers to let go, then the effect of increased teacher quality could make up for some or all of any negative effect of increasing class size.[31]

State resources for education should always be judiciously allocated, but the need to carefully weigh costs and benefits is particularly salient in times of austere budgets. Class-size reduction has been shown to work for some students in some grades in some states and countries, but its impact has been found to be mixed or not discernable in other settings and circumstances that seem similar. It is very expensive. The costs and benefits of class-size mandates need to be carefully weighed against all of the alternatives when difficult budget and program decisions must be made.

[31] See, e.g., Donald J. Boyd, Hamilton Lankford, Susanna Loeb, and James H. Wyckoff, "Teacher Layoffs: An Empirical Illustration of Seniority vs. Measures of Effectiveness," CALDER Brief 12 (July 2010) and Dan Goldhaber and Roddy Theobald, "Assessing the Determinants and Implications of Teacher Layoffs," CALDER Working Paper 55 (December 2010).

About the Brown Center on Education Policy

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The Brookings Institution
1775 Massachusetts Ave. NW
Washington DC, 20036
202.797.6090
202.797.6144 (f)
http://www.brookings.edu/brown.aspx

Governance Studies
The Brookings Institution
1775 Massachusetts Ave., NW
Washington, DC 20036
Tel: 202.797.6090
Fax: 202.797.6144
www.brookings.edu/governance.aspx

Editor
Christine Jacobs

Production & Layout
John S Seo

Email your comments to gscomments@brookings.edu