

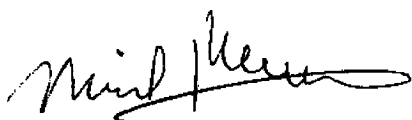
Michael Podgursky
5311 Red Castle Ct.
Columbia, MO 65203
April 19, 2012

Mr. Arthur S. Chalmers
Hite, Fanning & Honeyman LLP.
100 N. Broadway, Ste. 950
Wichita, KS 67202

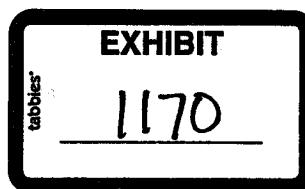
Dear Mr. Chalmers:

Please find attached my revised report.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael Podgursky", with a stylized flourish at the end.

Michael Podgursky
Professor of Economics



4/13/2012

Expert Report

Michael Podgursky
Professor of Economics
Department of Economics
University of Missouri
Columbia, MO

This report is divided into three sections.

Section I examines the performance of Kansas on the NAEP assessment relative to the US and other states.

Section II examines spending per student and related resource measures in Kansas and other states using data from the National Center for Education Statistics.

Section III examines the relationship between school district performance and district spending per student in Kansas.

I. The Relative Performance of Kansas on NAEP

Each state has its own K-12 assessments, but for the most part these are not comparable. The most reliable yardstick for comparing student performance from one state to another is the National Assessment of Educational Progress (NAEP). The following charts report data on fifty states plus DC on the most recent available NAEP assessments in math and reading in grades 4 and 8 (the only two grades reported at the state level in NAEP). In addition to the state scores, the US average score is also plotted, thus permitting easy visual comparison of Kansas to other states and to the US overall.

(The most recent NAEP assessment in science was 2009. While Kansas participated in the assessment, the sample size was too small to meet NCES reporting standards so no data are reported for the state. <http://nces.ed.gov/nationsreportcard/science/stateassessment.asp>)

In the following charts, average NAEP scores are reported for all public school students, and for three subgroups of public school students (FRL-eligible, Black, Hispanic).

In the color scheme, Kansas is highlighted, as well as the four states that border Kansas (Missouri, Oklahoma, Colorado, and Nebraska).

Not all charts include 51 data points. Since NAEP scores are based on a sample of students in each state, it is sometimes the case for sub-groups that NCES did not report a score due to small cell size. All of the state data reported by NCES are reported in the charts. No other exclusions are made.

Visual examination of these data shows that Kansas NAEP performance compares favorably not only to neighboring states but also nationally. This pattern holds not just for overall scores, but also for subgroups.

Since NAEP is based on a sample of students, some observed differences may simply reflect sampling error. Table 1 shows a 90 percent confidence interval for the US average NAEP score and the Kansas average score. The shaded cells are those in which the Kansas confidence interval is entirely above the US interval. This indicates that the observed difference in mean scores is statistically significant. In math, in 7 of 8 comparisons, the average score for Kansas is significantly above the US average. In reading, the Kansas score is significantly higher in 4 of 8 cases. There are no cases in which Kansas has a NAEP score significantly below the US average.

Note on NAEP data.

Data in Table 1 and all subsequent charts were downloaded from the interactive NAEP data engine on the NCES web site.

<http://nces.ed.gov/nationsreportcard/naepdata/>

Table 1: 90 Percent Confidence Intervals for US and Kansas 2011 NAEP Scores by Grade, Group and Subject (Shaded Kansas Scores Significantly Above US)

	Reading		Math	
Grade 4	US	Kansas	US	Kansas
All	219-221	222-226 +	240-241	244-248 +
FRL-Eligible	206-207	209-214 +	229-230	236-240 +
Black	229-230	227-231	223-224	223-231
Hispanic	204-207	205-212	228-230	232-237 +
Grade 8				
All	263-264	265-269 +	282-283	288-291 +
FRL-Eligible	251-252	254-258 +	268-270	275-278 +
Black	247-249	242-254	261-263	265-273 +
Hispanic	250-252	250-258	269-270	271-278 +

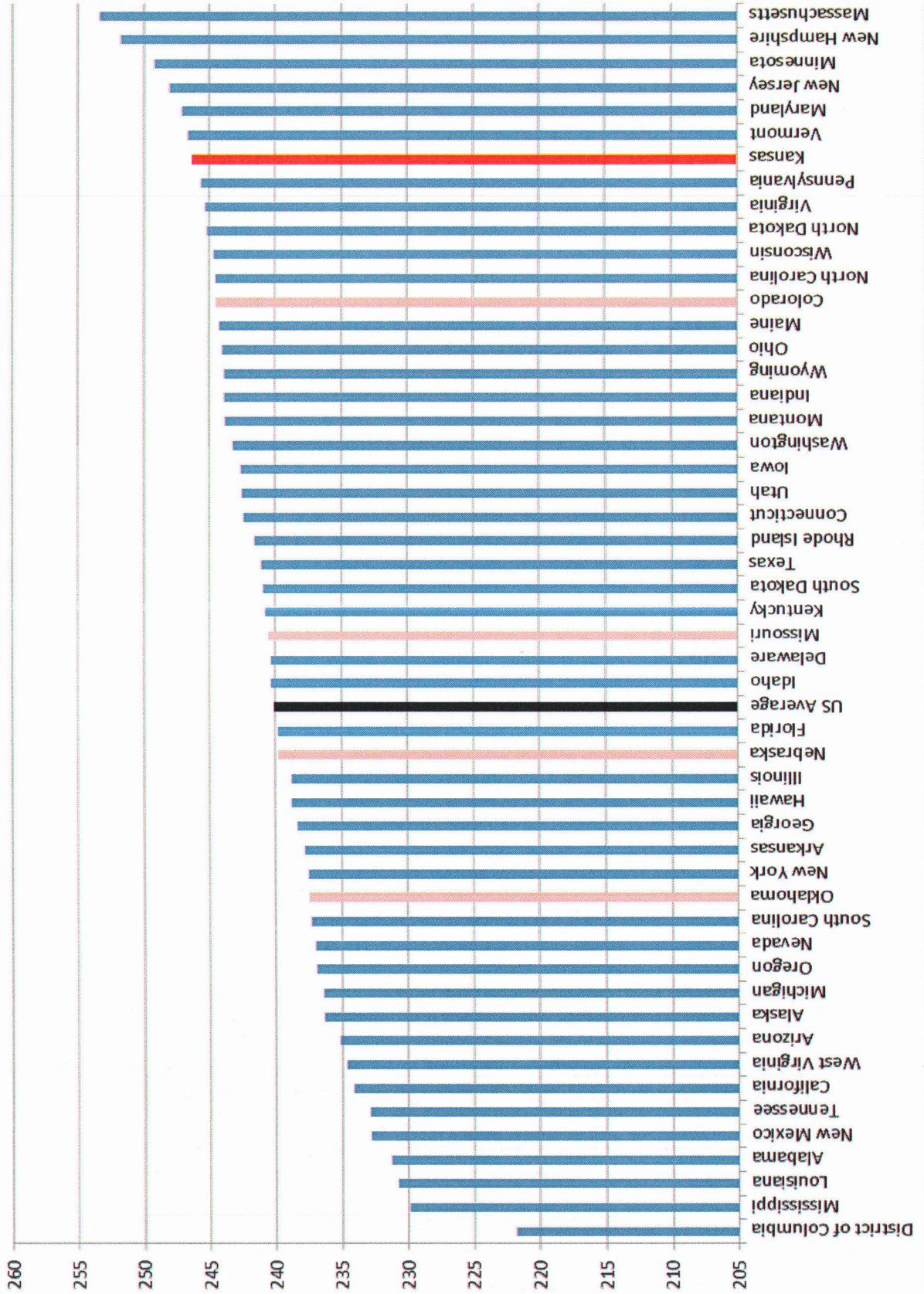
Math

2011

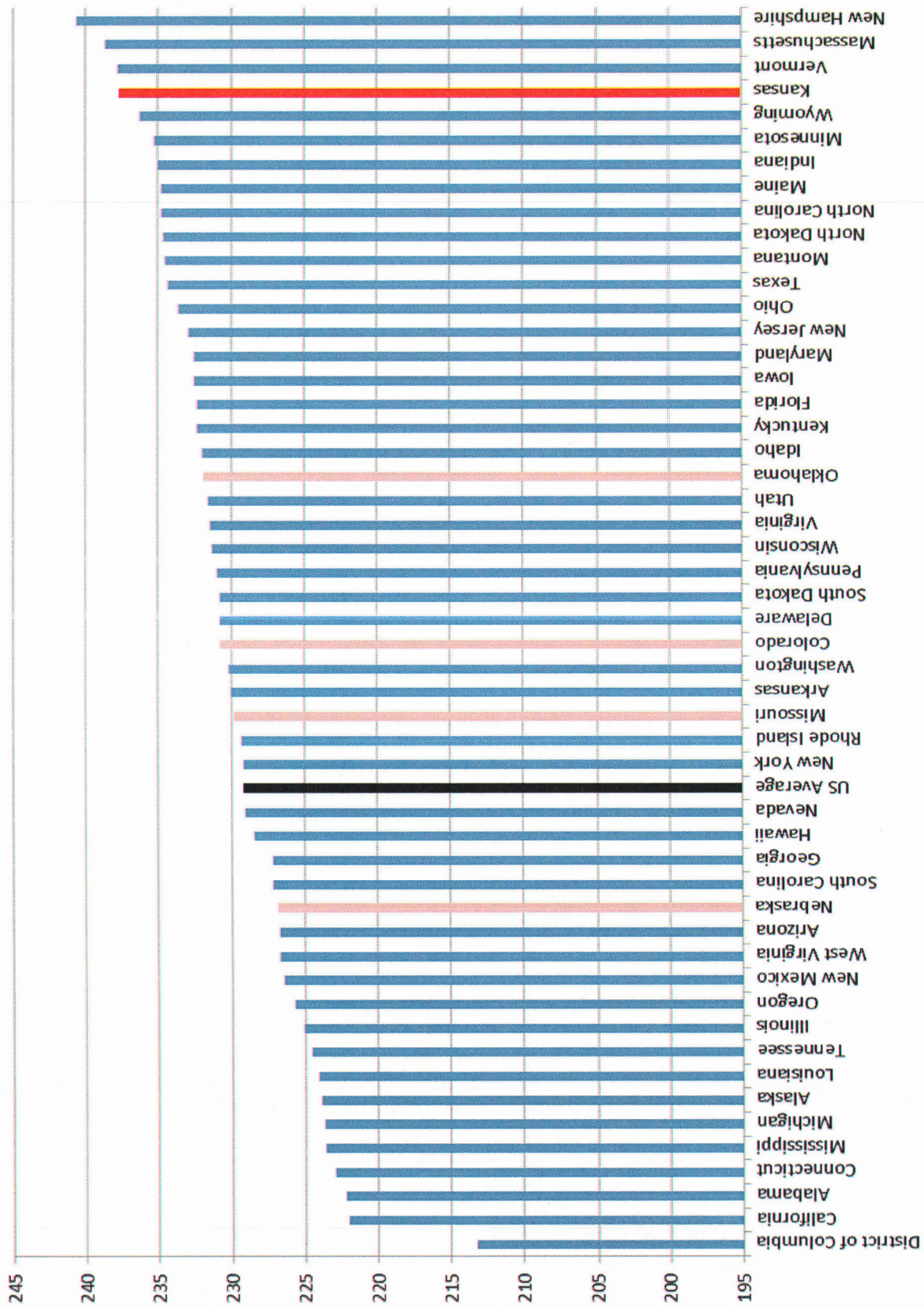
Public School Students

Grades 4 and 8

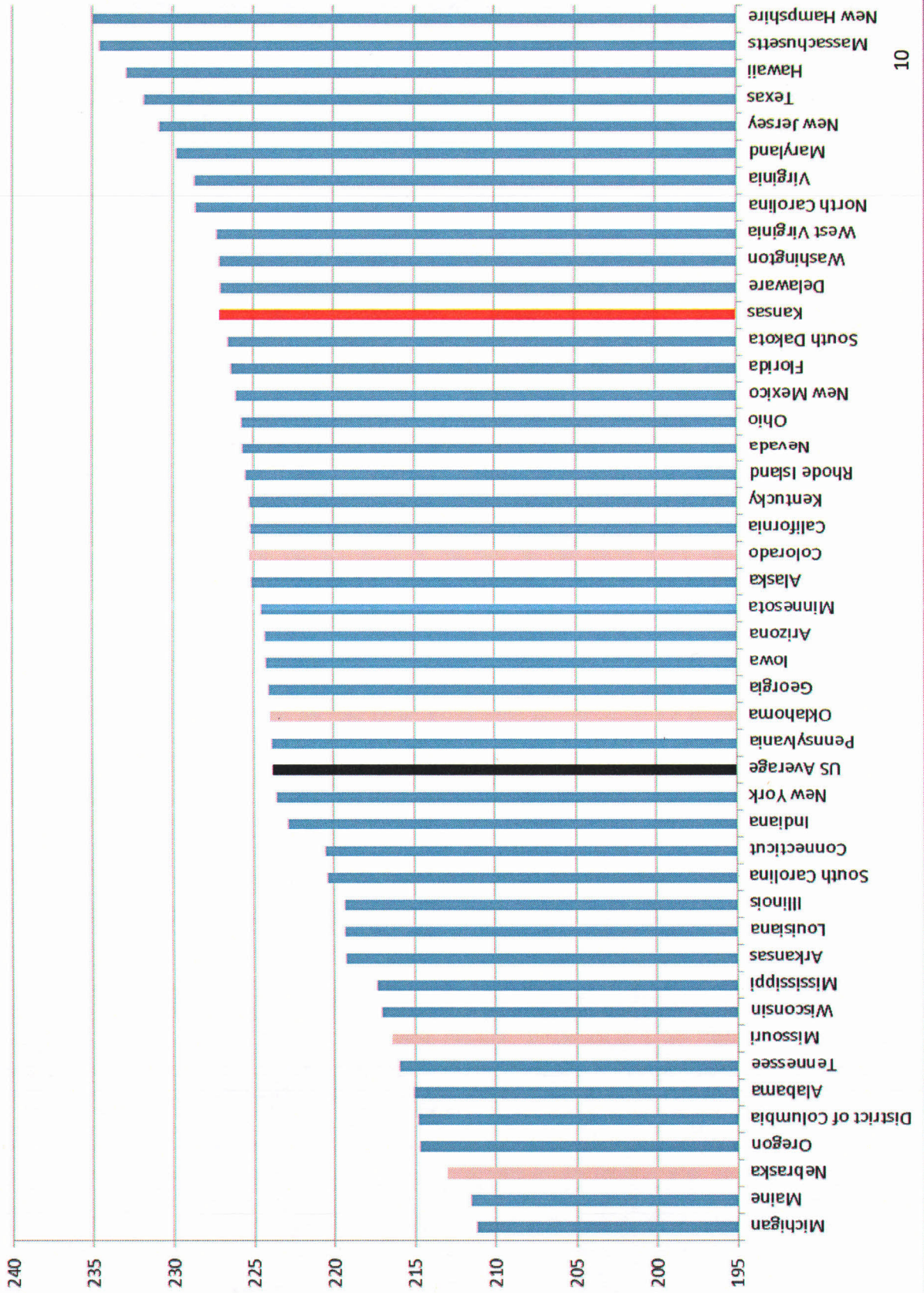
NAEP 4th Grade Math All Students 2011: Public Schools



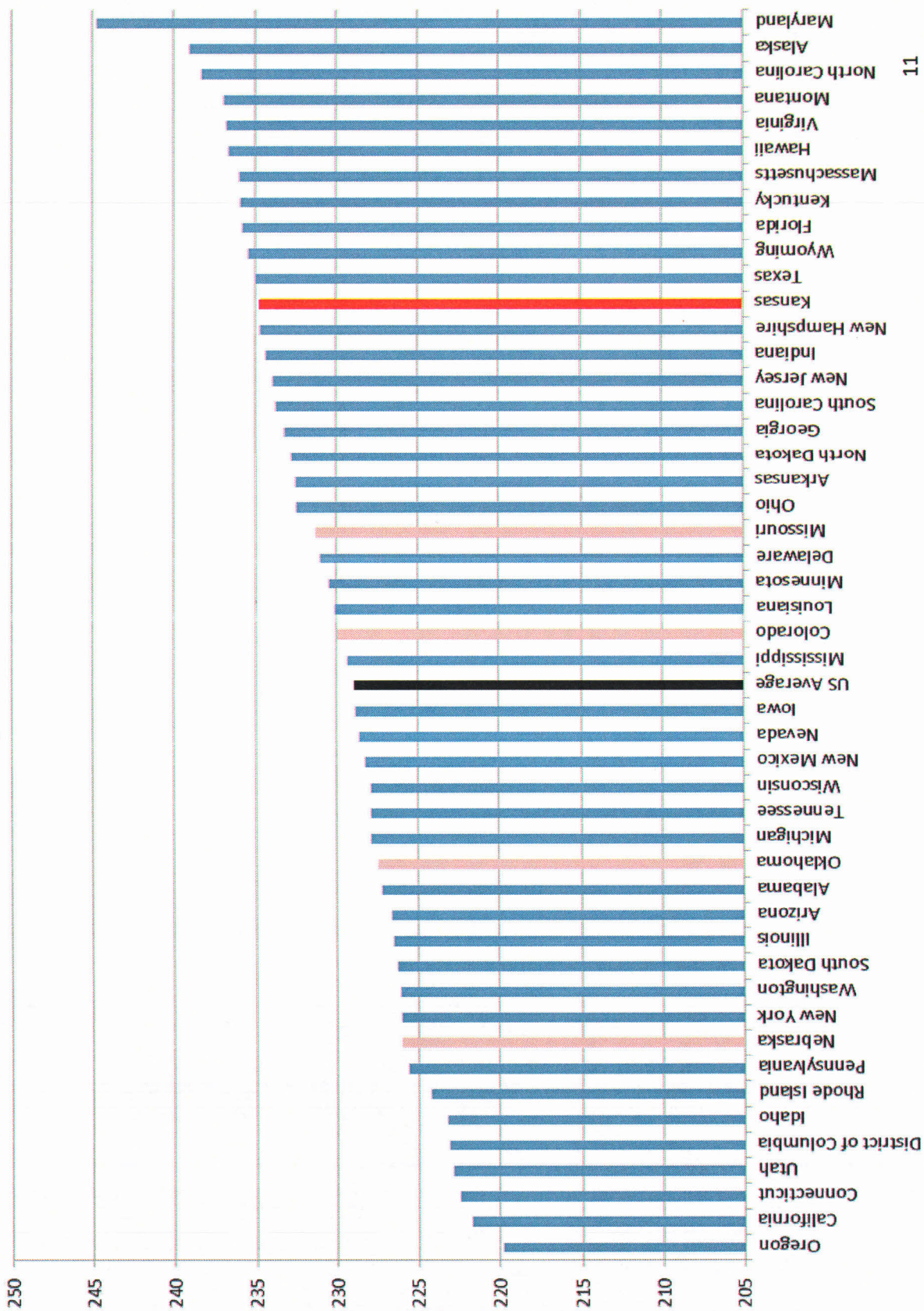
NAEP 4th Grade Math FRL Students 2011: Public Schools



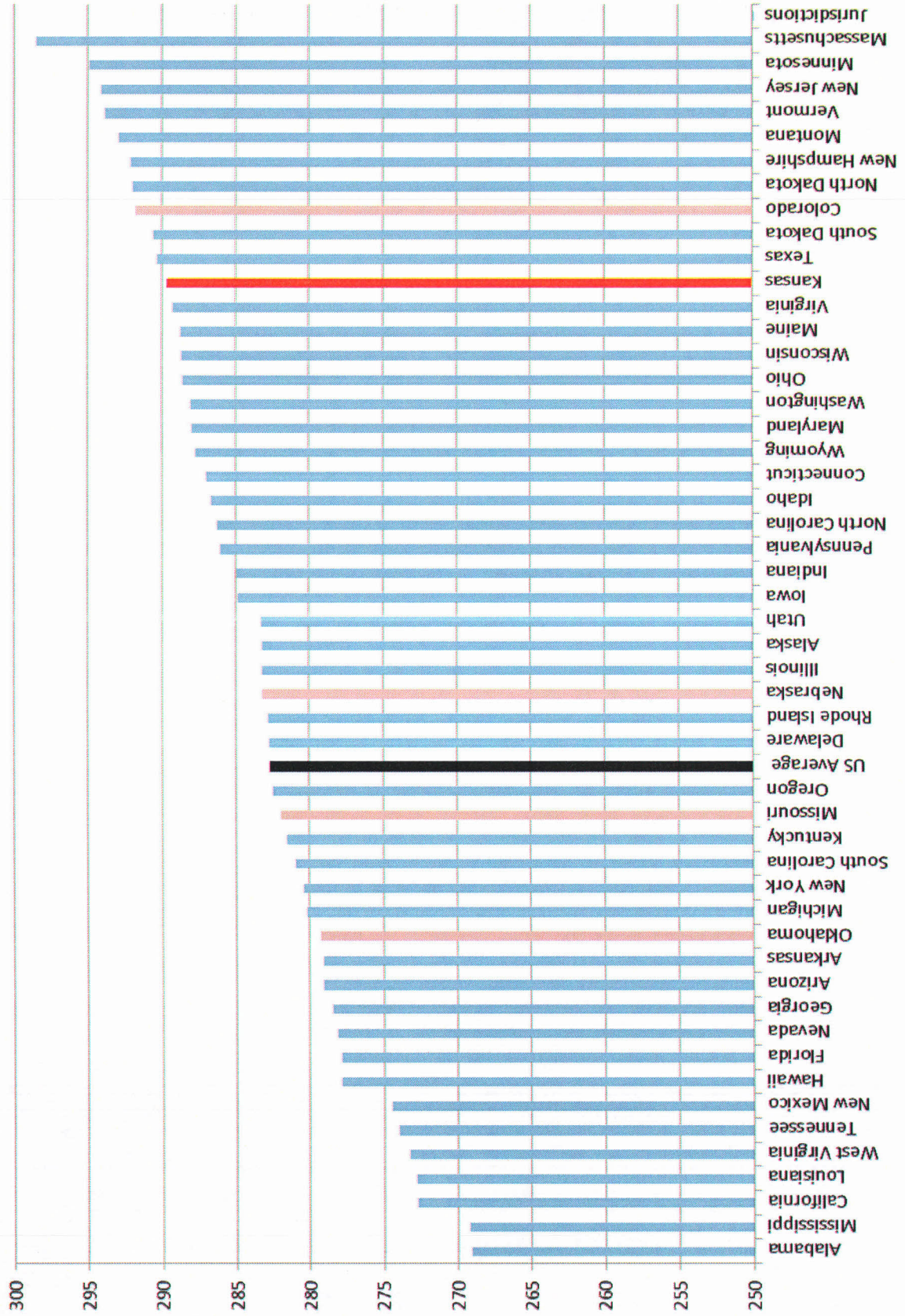
NAEP 4th Grade Math Black Students 2011: Public Schools



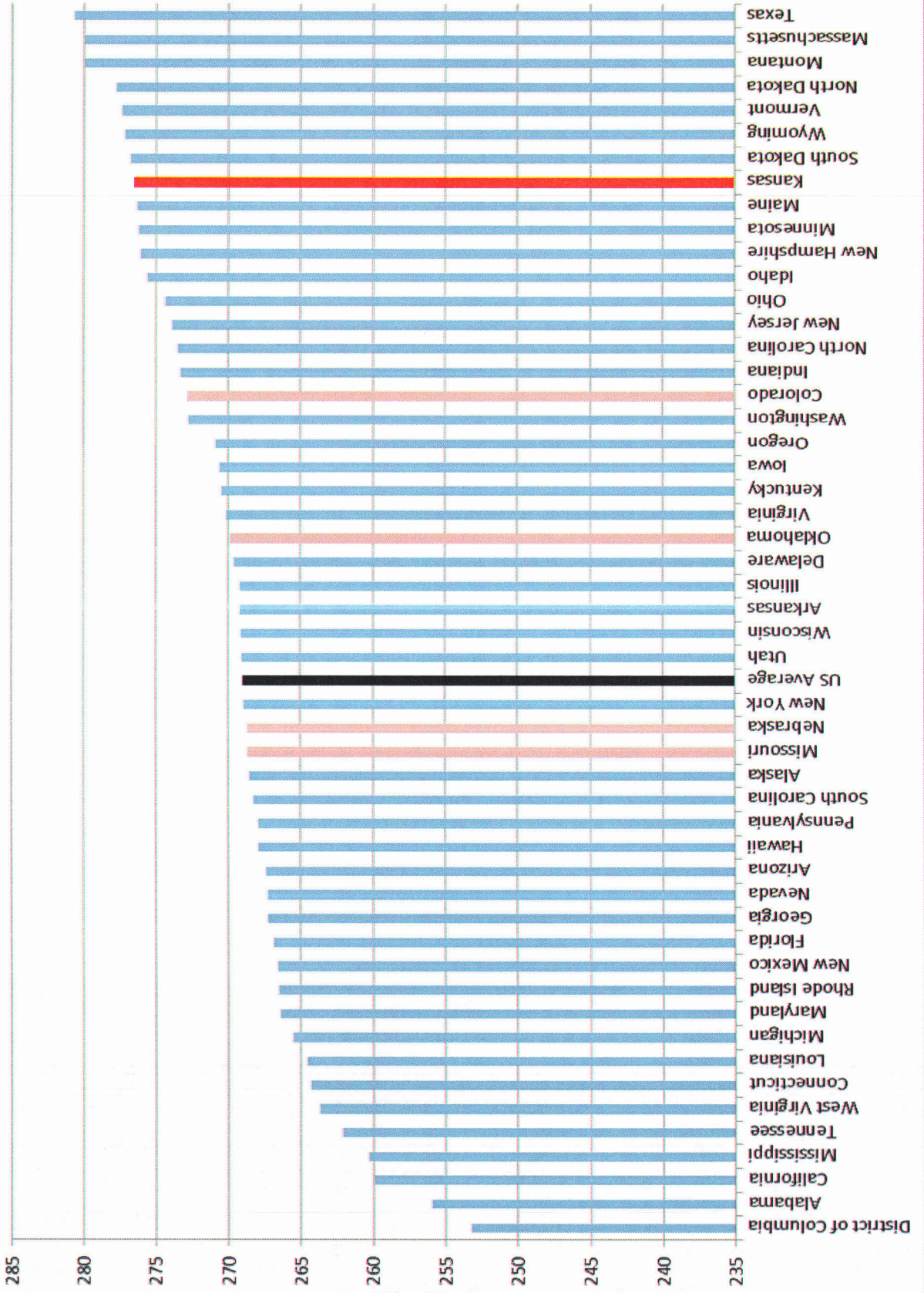
NAEP 4th Grade Math Hispanic Students 2011: Public Schools



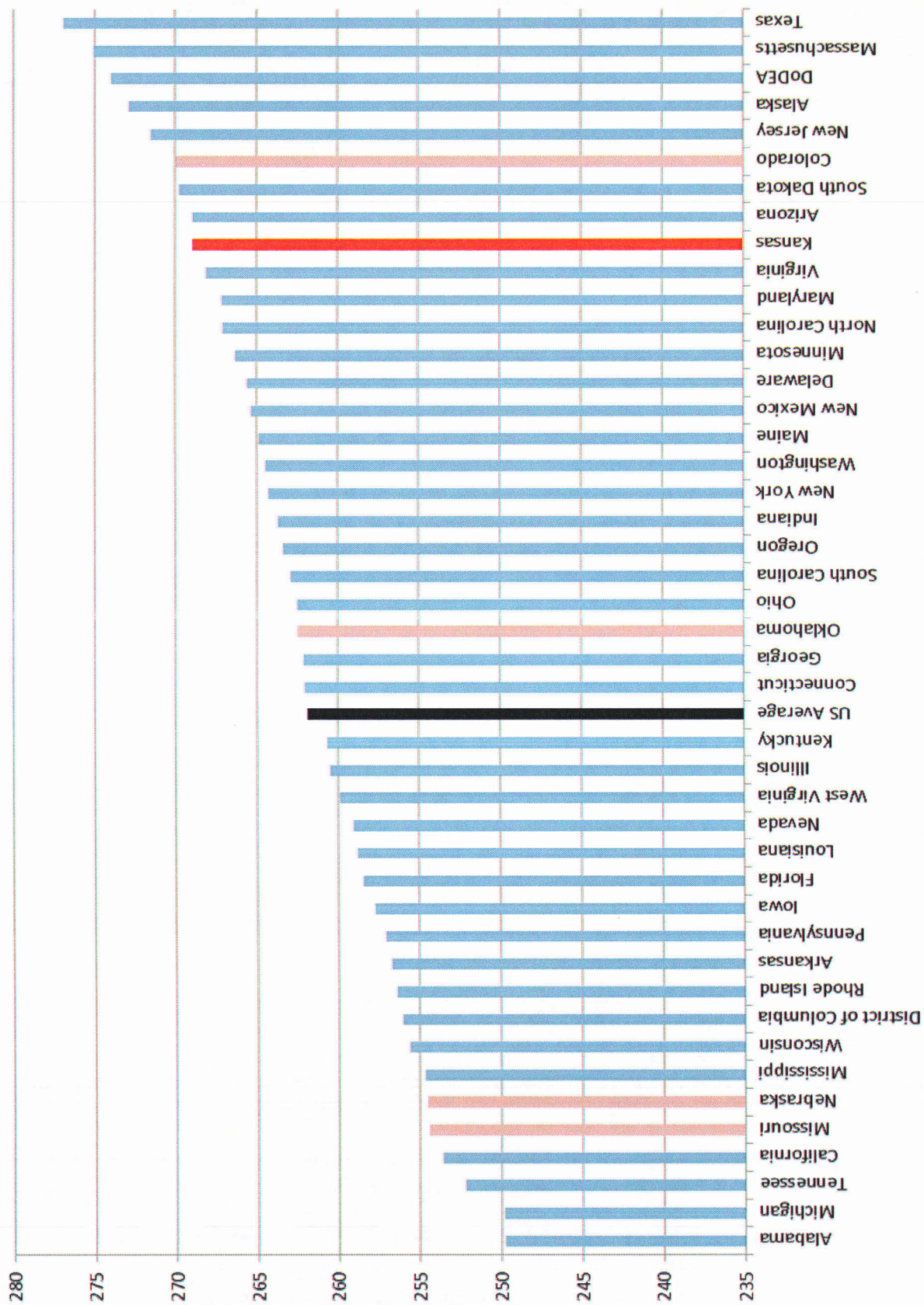
NAEP 8th Grade Math All Students 2011: Public Schools



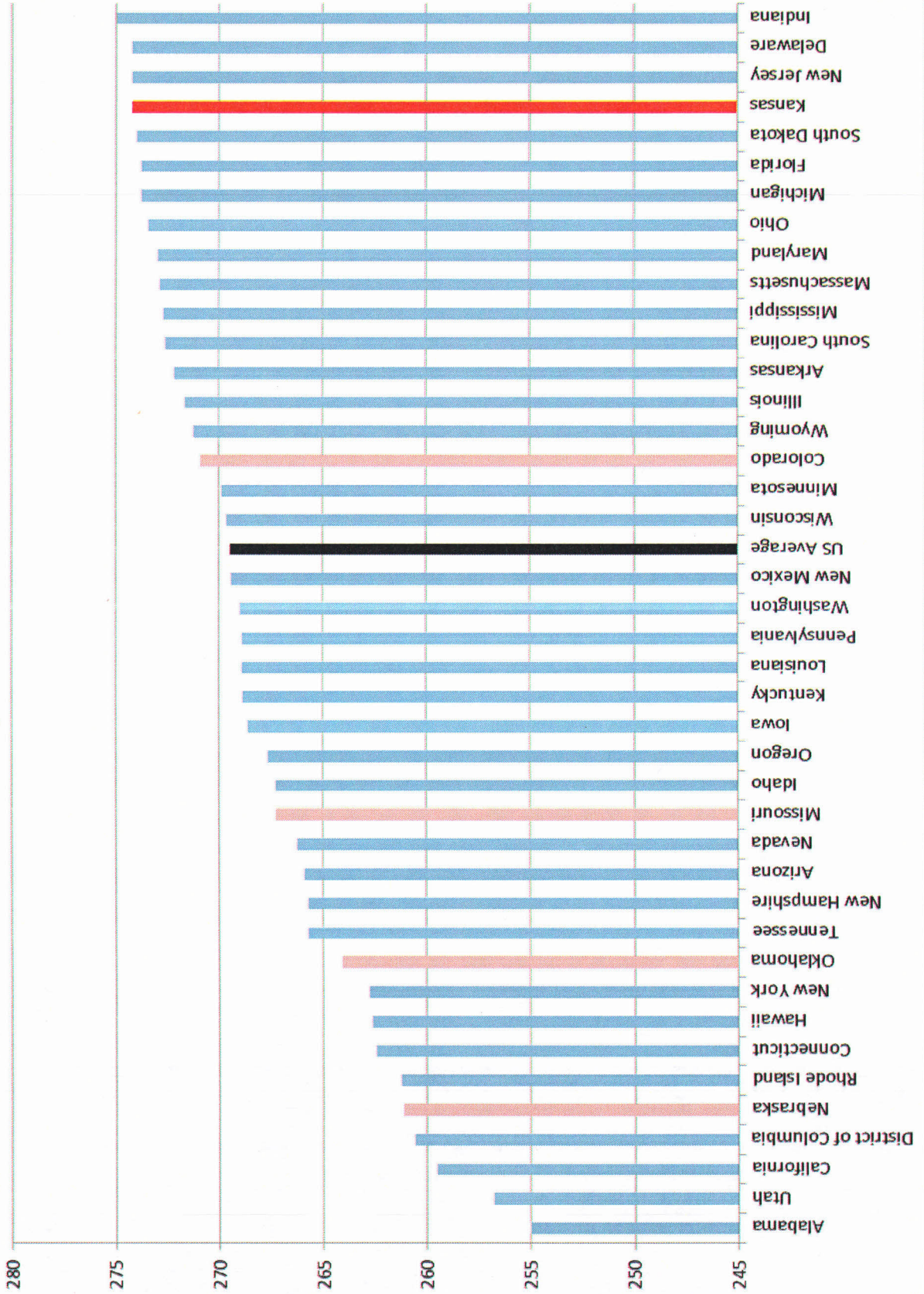
NAEP 8th Grade Math FRL Students 2011: Public Schools



NAEP 8th Grade Math Black Students 2011: Public Schools



NAEP 8th Grade Math Hispanic Students 2011: Public Schools



Reading

2011

Public School Students

Grades 4 and 8

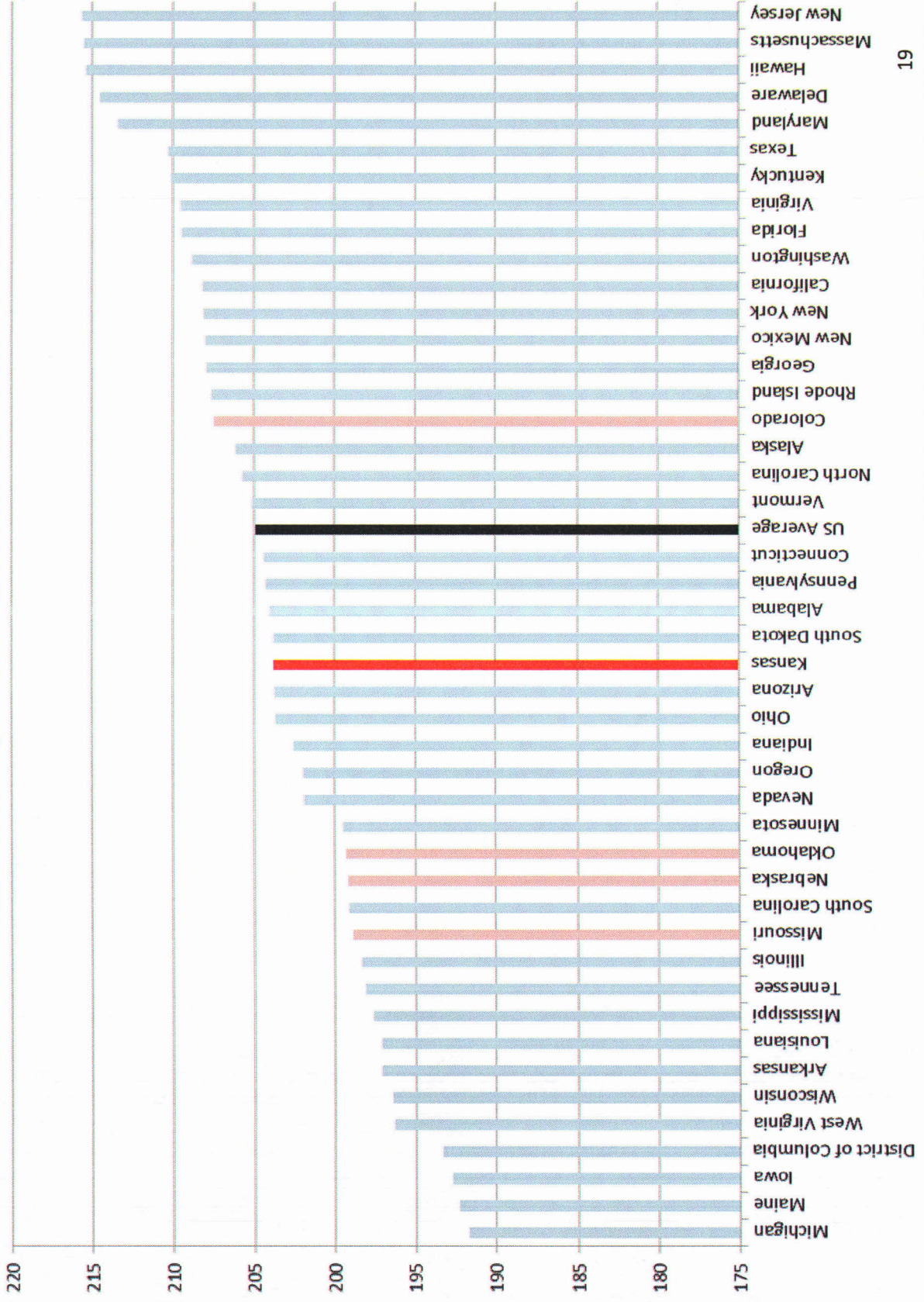
NAEP 4th Grade Reading All Students 2011: Public Schools



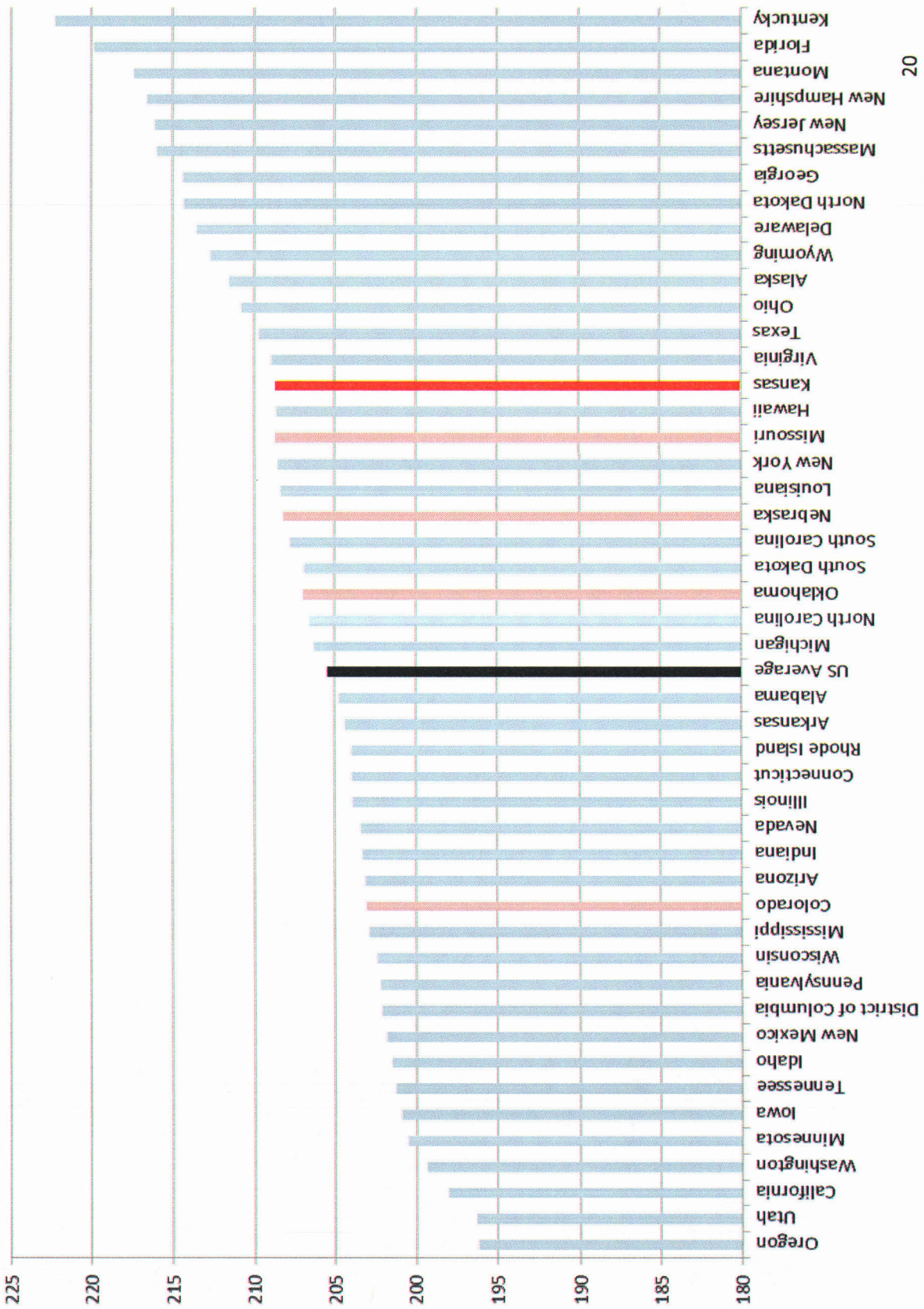
NAEP 4th Grade Reading FRL Students 2011: Public Schools



NAEP 4th Grade Reading Black Students 2011: Pubic Schools



NAEP 4th Grade Reading Hispanic Students 2011: Public Schools



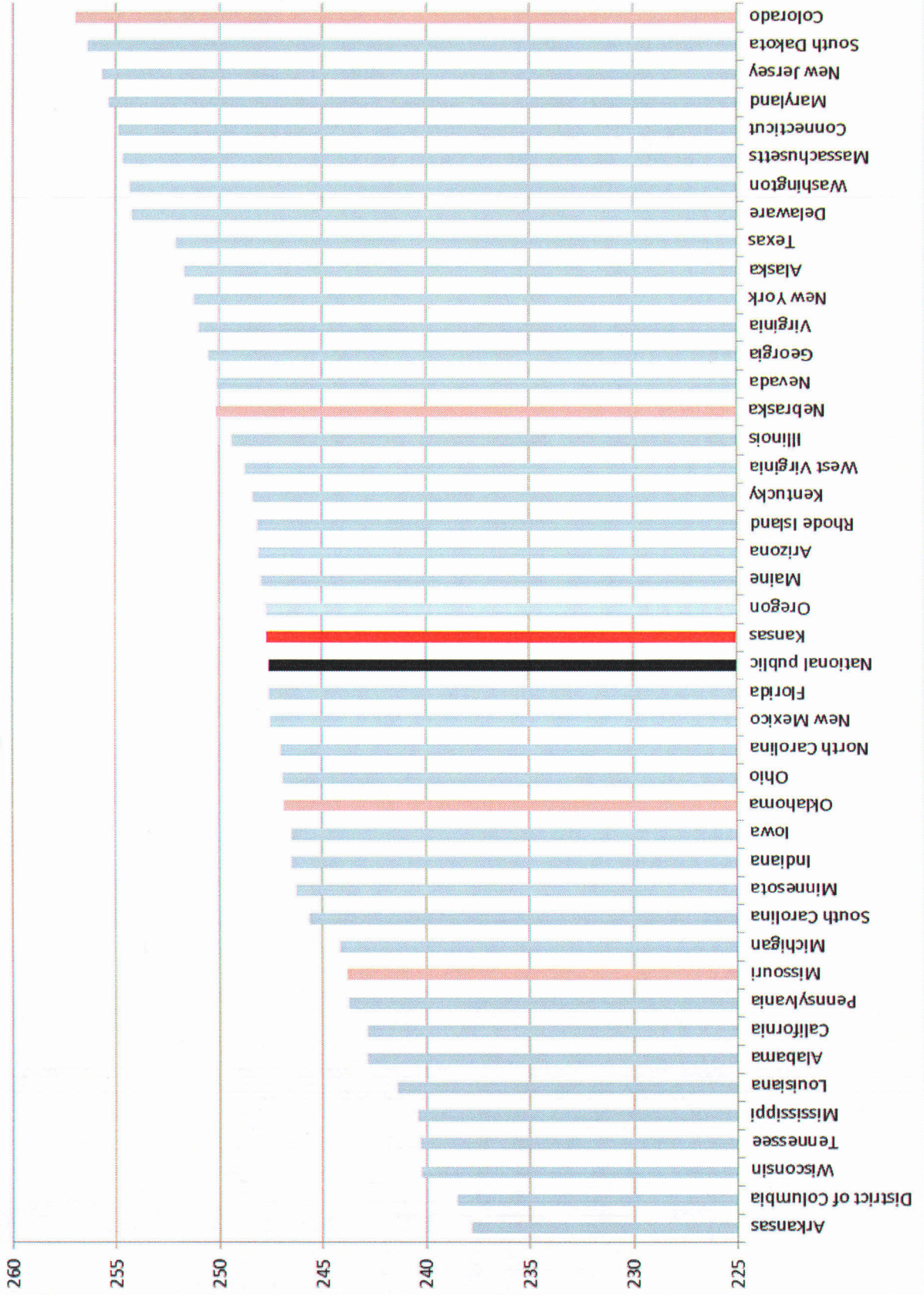
NAEP 8th Grade Reading All Students 2011: Public Schools



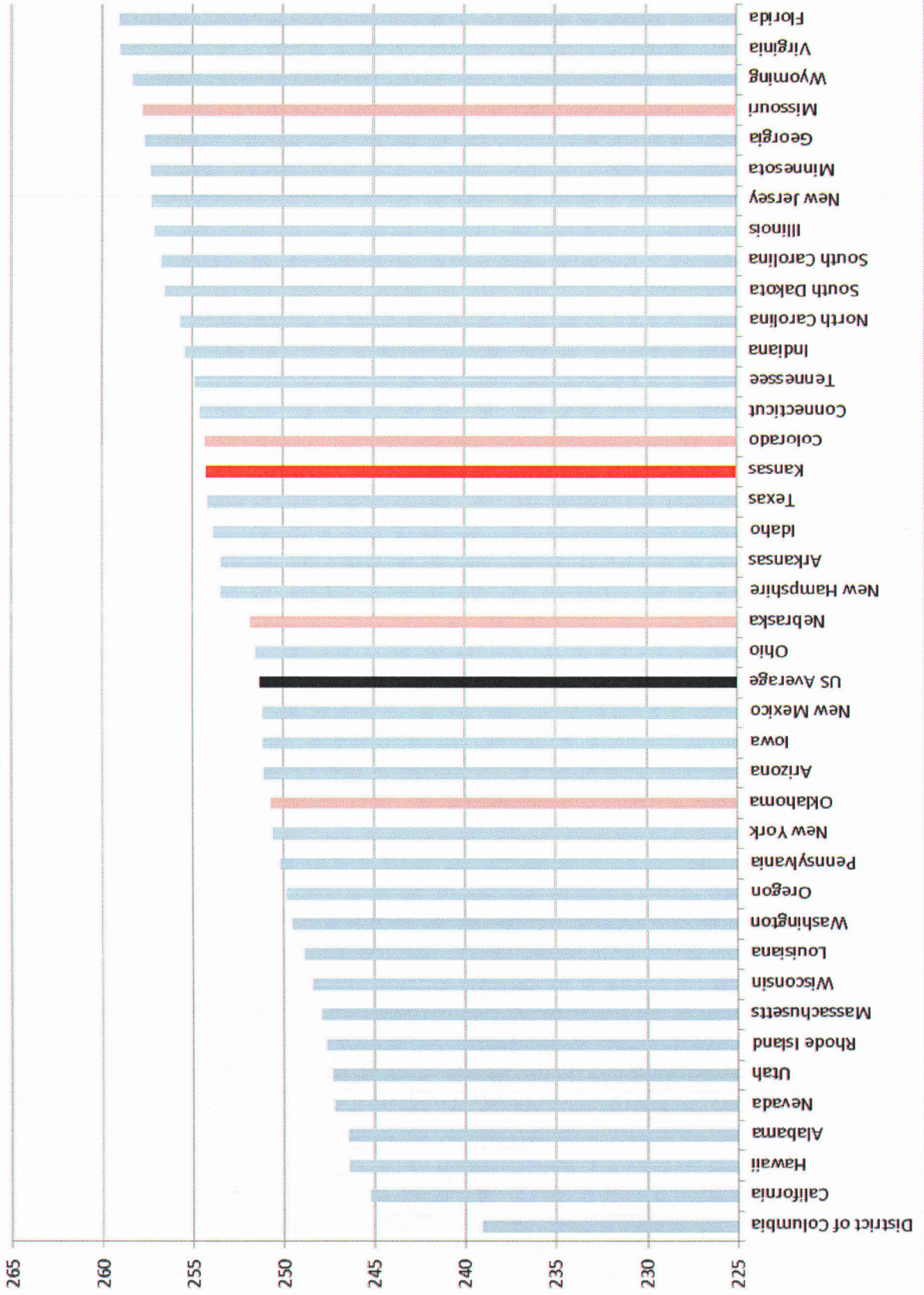
NAEP 8th Grade Reading FRL Students 2011: Public Schools



NAEP 8th Grade Reading Black Students 2011: Public Schools



NAEP 8th Grade Reading Hispanic Students 2011: Public Schools



II. Relative Spending and Related Resource Measures in Kansas

This section compares K-12 education spending per pupil and related resource measures using the most recent data from the National Center for Education Statistics (NCES).

Figure 1 reports current spending per pupil in Kansas and the other states (plus DC) for school year 2008-09, the most recent year for which NCES data are available. Kansas ranked 24 among the states with an average level of spending that was just below the national average. This level of spending was also above that of three of the four surrounding states.

Figure 2 reports current spending deflated by the Comparable Wage Index (CWI) an experimental approach to adjusting for geographic cost differences in the cost of delivering K-12 education services. This is an index measuring the earnings of college-educated workers in states and regional markets (Taylor and Fowler, 2006). If one deflates each state spending measure by the CWI, the relative position of Kansas improves. This reflects the fact that the average salaries of college-educated non-teachers are higher in many of the states that rank above Kansas in terms of school spending. Kansas's rank rises to 19 with this adjusted measure.

Figure 3 reports estimated average base teacher salaries by state, as reported by NCES. Base salaries exclude salary supplements for extra duties such as coaching, as well as any type of bonuses or supplemental pay (e.g., for NBPTS certification, career ladder). They also exclude summer pay. The rank of Kansas falls with this measure, to 37th among the states, and is well below the national average.

At first glance, it might seem inconsistent for Kansas to rank in the middle on a measure of spending per student but relatively low on a measure of teacher pay. This inconsistency is explained by the fact that Kansas has a relatively low student-teacher ratio. Ignoring other costs, if revenues per student rise by ten percent, a school district can hold teacher staffing ratios constant and raise teacher pay by ten percent, or it can hold pay constant and lower the staffing ratio by ten percent, or any combination of the two that totals ten percent. School districts in Kansas have shown a preference for lower staffing ratios.

This is seen in Figures 4 and 5, which present data on student-teacher ratios. Figure 4 reports the most recent available data reported by NCES. In Fall, 2008, there were 15.3 students per teacher nationally. In Kansas, the ratio was 13.1, or more than two fewer students per teacher. Not only is this ratio well below the US average, but is also low relative to the other states and Kansas's neighbors. This indicates that Kansas has "traded off" higher salaries for lower staffing rates. For example, if Kansas increased its student teacher ratio to the national average it would be possible to raise the salary of every teacher in Kansas by 17 percent (or, preferably, selectively award performance bonuses that total 17 percent of payroll). In terms of Figure 3 this would raise the average teacher salary in Kansas by 17 percent, and move Kansas from 37th to 18th place in the teacher salary ranking – approximately equal to the US average.

More limited survey data suggest that Kansas schools on average have smaller class sizes as a result of this policy. In 2008, the average class size for a self-contained elementary school class nationally was

20.3 students, in Kansas it was 19.4. At the secondary level, the average class size for a departmentally taught class was 23.3 students nationally versus 20.6 in Kansas.¹

Thus, overall Kansas compares favorably nationally and with neighboring states in spending for K-12 education. Salaries are relatively lower, but this is explained by lower staffing ratios.

Adequacy of Teacher Compensation

An important indicator of the adequacy of teacher salaries is the ratio of qualified applicants to vacancies. If schools are able to staff their classes with qualified teachers, this suggests a basic level of adequacy of salary and benefits. Unfortunately, we were unable to get data in a timely way from the four key plaintiff districts that would permit careful examination of this question.

References

Taylor, L. L. and Fowler, W.J. Jr. (2006) A Comparable Wage Approach to Geographic Cost Adjustment (NCES2006-321) U.S. Department of Education. Washington DC: National Center for Education Statistics. <http://nces.ed.gov/pubs2006/2006321.pdf>

¹ http://nces.ed.gov/surveys/sass/tables/sass0708_2009324_t1s_08.asp

Figure 1

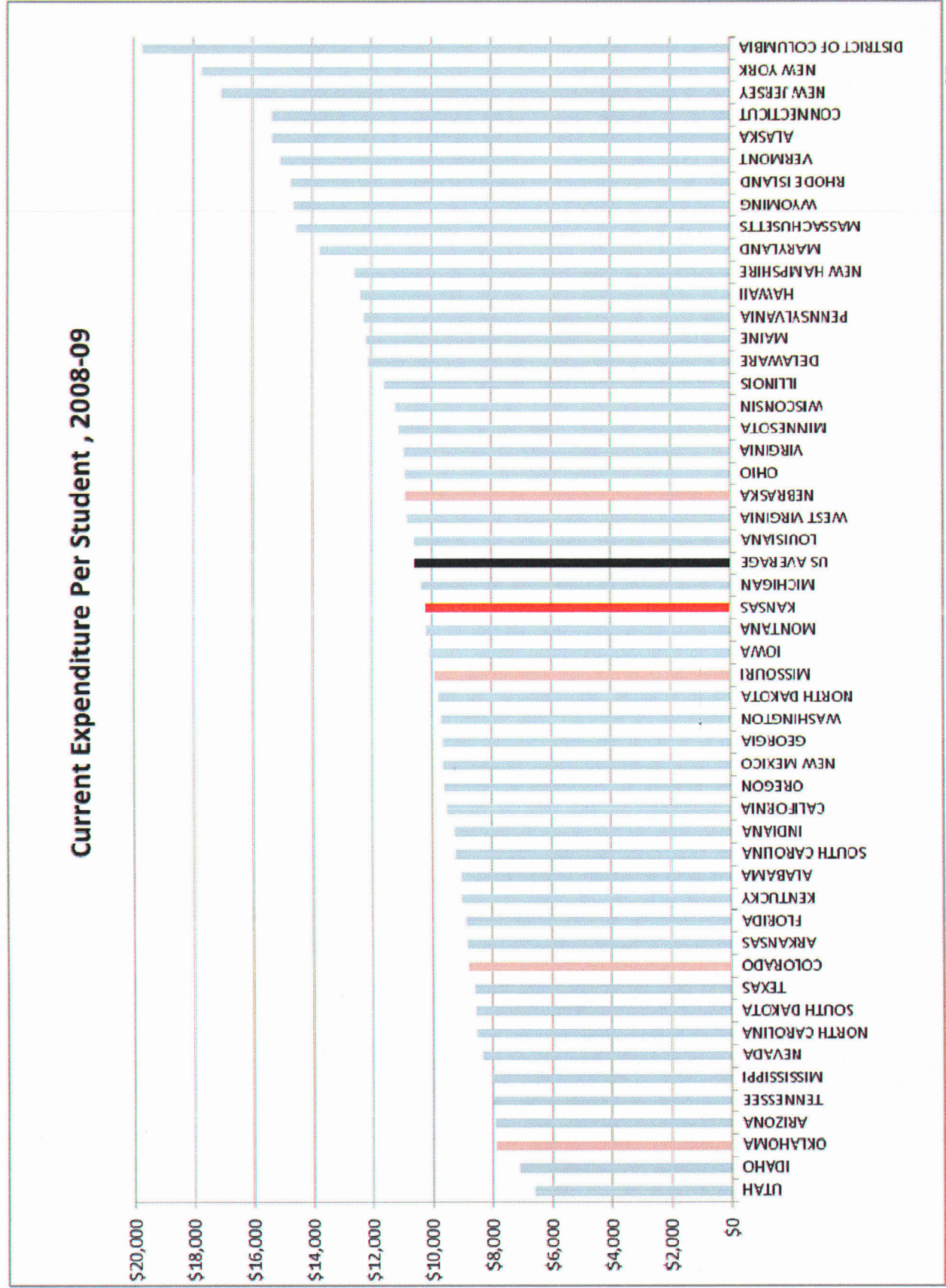


Figure 2

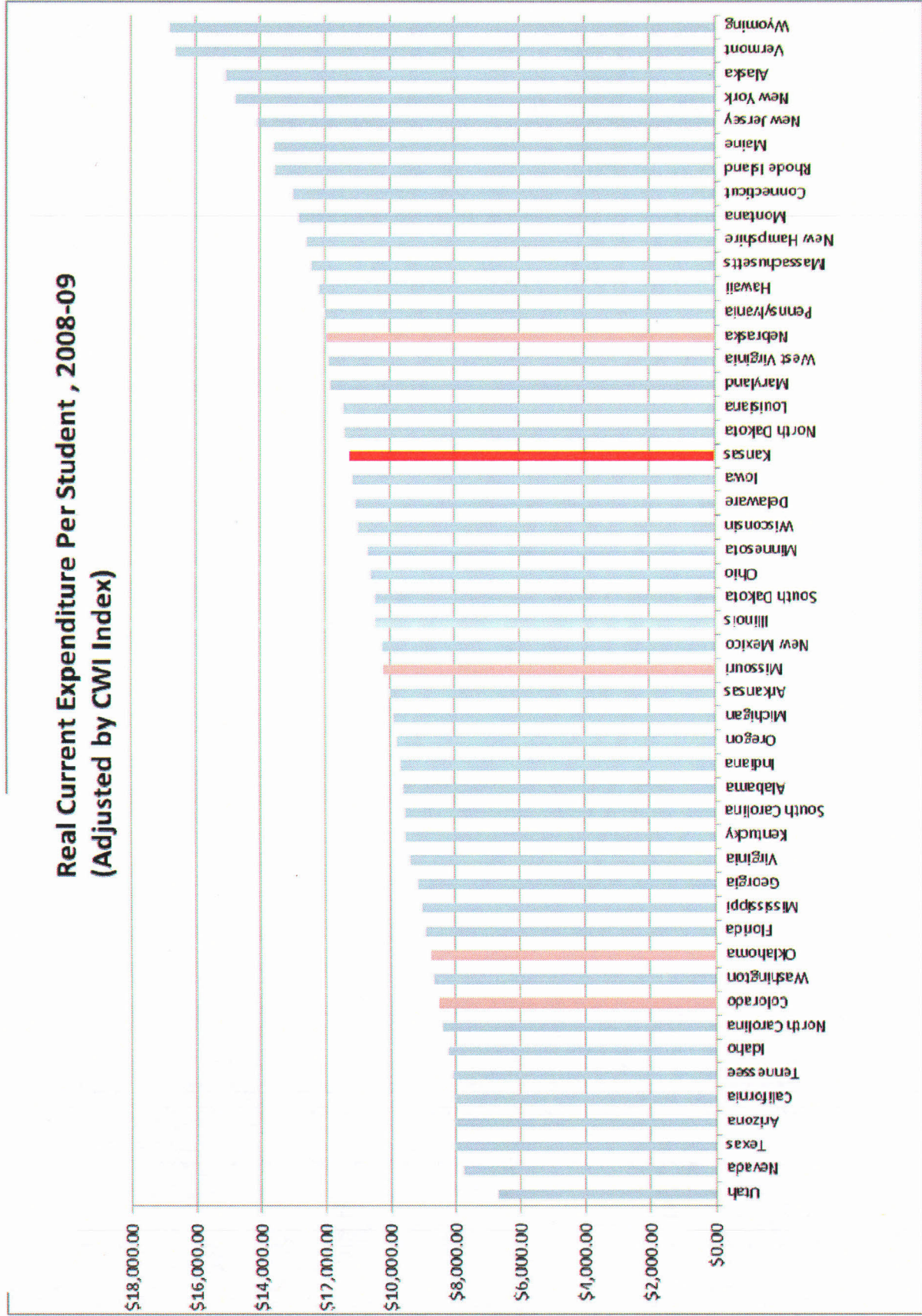


Figure 3

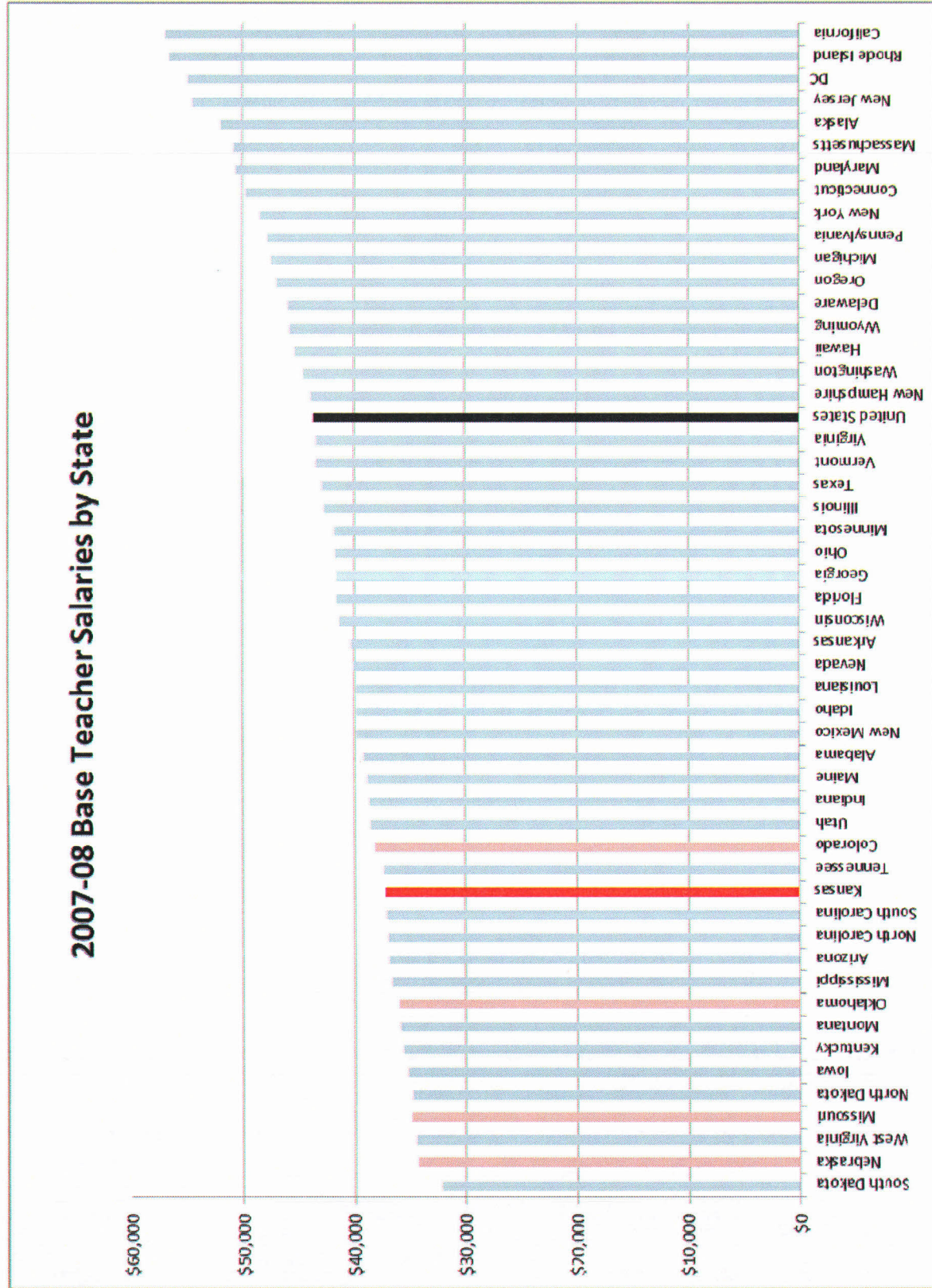
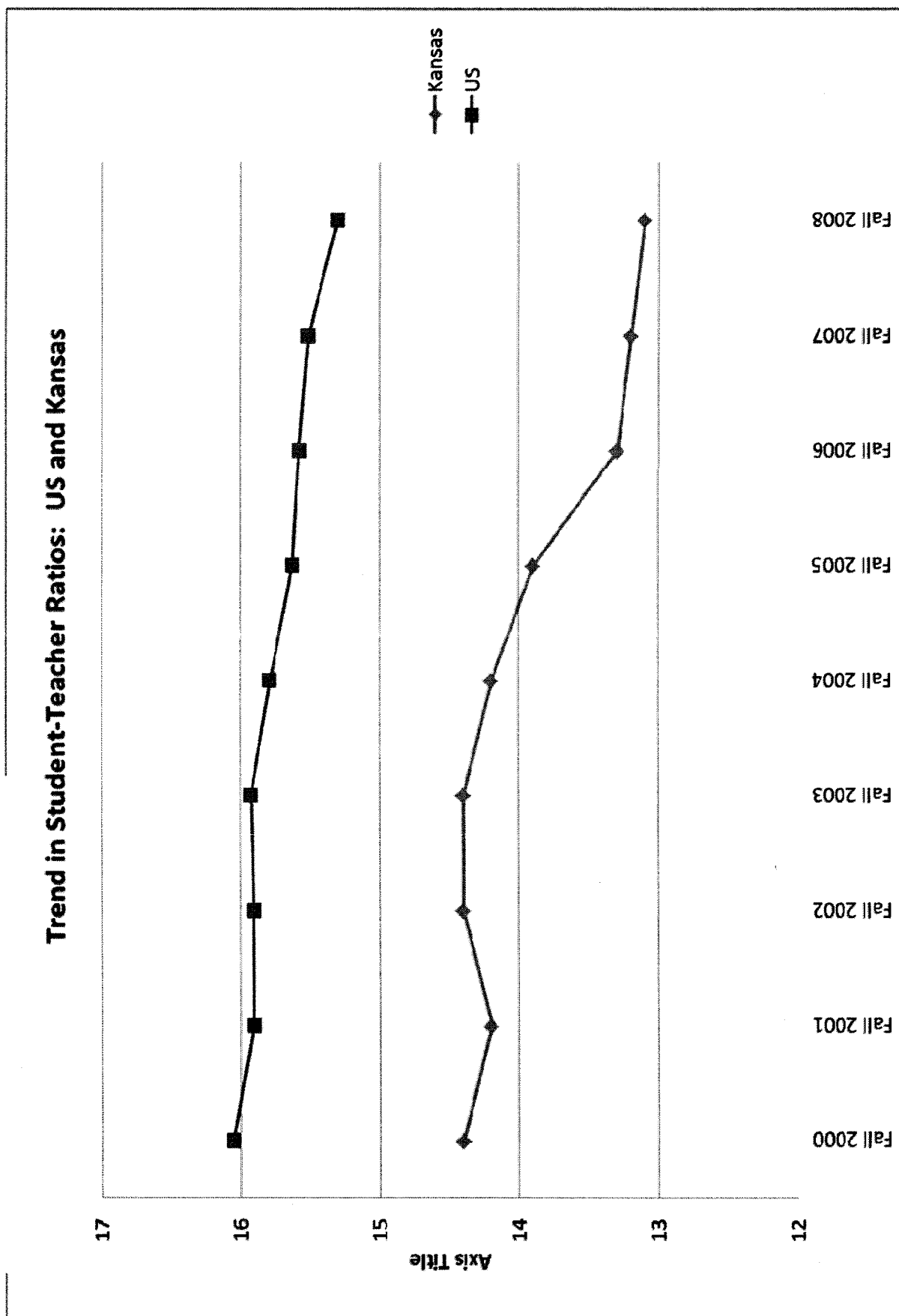


Figure 4

Student-Teacher Ratios by State: 2008-09



Figure 5



Sources for data

Figure 1

Data Source: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "National Public Education Financial Survey (State Fiscal)", 2008-09 (FY 2009), v.1a.
Accessed via CCD data engine

Figure 2

Same as Figure 1 and OMI state file downloaded from NCES

<http://nces.ed.gov/edfin/adjustments.asp>

Figure 3. Digest of Education Statistics, 2010. Table 80

Figure 4 Digest of Education Statistics, 2010. Table 70.

Figure 5 Digest of Education Statistics, 2010, Table 70, and selected earlier volumes

III. Student Achievement and Spending in Kansas School Districts

The follow charts plot the relationship between median 2011 Kansas assessment scores by district and 2010-11 current operating expenditures per student. These data were provided by the Kansas Department of Education. For each district, median scale scores are reported for math, reading, and science at three school levels: elementary, middle/junior high, and high school.

For each of these groups, median scores are reported for all students and several subgroups (FRL-eligible, black, Hispanic, disabled, and English Language Learners).

In order to protect the confidentiality of the student test scores, KSDE only provided cell median values for assessment scores if there were ten or more students with valid scores. Thus the number of observations plotted varies from group to group. For example, there are more points plotted for All students than for Hispanic students because there are more district level cells that were excluded for the latter group. In all cases, the data plotted are all observations meeting the “ten our more” threshold established by KSDE. No other filters are used.

These data show that there is no systematic or stable positive statistical relationship between spending per student in a district and student achievement. Indeed, it is much more common to find a negative relationship between the two variables. This does not mean that higher spending causes lower student achievement. Rather, it simply indicates that reliable statistical relationship between the two variables does not exist. Simply put, it is not possible to identify a level of district spending per student that can reliably predict any given level of student achievement. Alternately, one cannot fix a level of performance and reliably “cost out” spending that will support that level of performance, as is done in education cost function studies.

These charts focus on current (2011) test score data and spending. A careful, long-term analysis of changes in district performance, as measured by test scores and graduation rates, and changes in spending may be found in Neymotin (2010). Neymotin finds no statistically significant relationship between changes in spending and student “persistence” (graduation rates, dropout rates, diploma rates) or changes in test scores. These findings reinforce what we observe in the charts below.

This does not mean that resources do not matter. It means that over the range of district spending observed in the Kansas data no stable relationship between spending and achievement emerges. There is nothing novel in this finding for Kansas. This weak relationship between district spending and student achievement has been observed in other states (Podgursky, 2007; Costrell, Hanushek and Loeb, 2008; Imazeki, 2008) and is widely discussed and debated in the larger scholarly research literature (Hanushek, 1986, 2003; Greenwald, Hedges, Laine, 1996).

Technical note on graphs.

The scaling on the horizontal axis is automatically set by the statistical software based on the range of variation of the independent (x) variable including cases where the dependent (y) variable is missing (i.e., due to KSDE suppression). For some subgroups, this results in a rather compressed range of points

plotted on the x-axis. Rather than alter the range on the x-axis from graph to graph, the default for all districts in the database is used. This in no way alters the results described above.

References

Costrell, Robert, Eric Hanushek, Susanna Loeb. (2008). What Do Cost Functions Tell Us About the Cost of an Adequate Education? *Peabody Journal of Education*. 83, 198-233.

Greenwald, Rob, Larry V. Hedges, Richard D. Laine. (1996) The Effect of School Resources on Student Achievement. *Review of Education Research*. 66, 361-396.

Hanushek, Eric (1986). The Economics of Schooling: Production and Efficiency in Public Schools. *Journal of Economic Literature*. 24, 1141-1177.

Hanushek, Eric. (2003). The Failure of Input-Based Schooling Policies. *Economic Journal*. 113, F64-F98.

Imazeki, Jeniffer. (2008). Assessing the Costs of Adequacy in California Public Schools: A Cost Function Approach. *Education Finance and Policy*. 3, 90-108.

Neymotin, Florence. (2010). The Relationship between School Funding and Student Achievement in Kansas Public Schools. *Journal of Education Finance*. 36, 88-108.

Podgursky, Michael. (2007). Trial Slides: CEE vs State of Missouri.

http://web.missouri.edu/%7Epodgurskym/papers_presentations/presentations/Trial_slides_Podgursky.ppt

I. 2011 Kansas Assessment versus District Current Spending per Student

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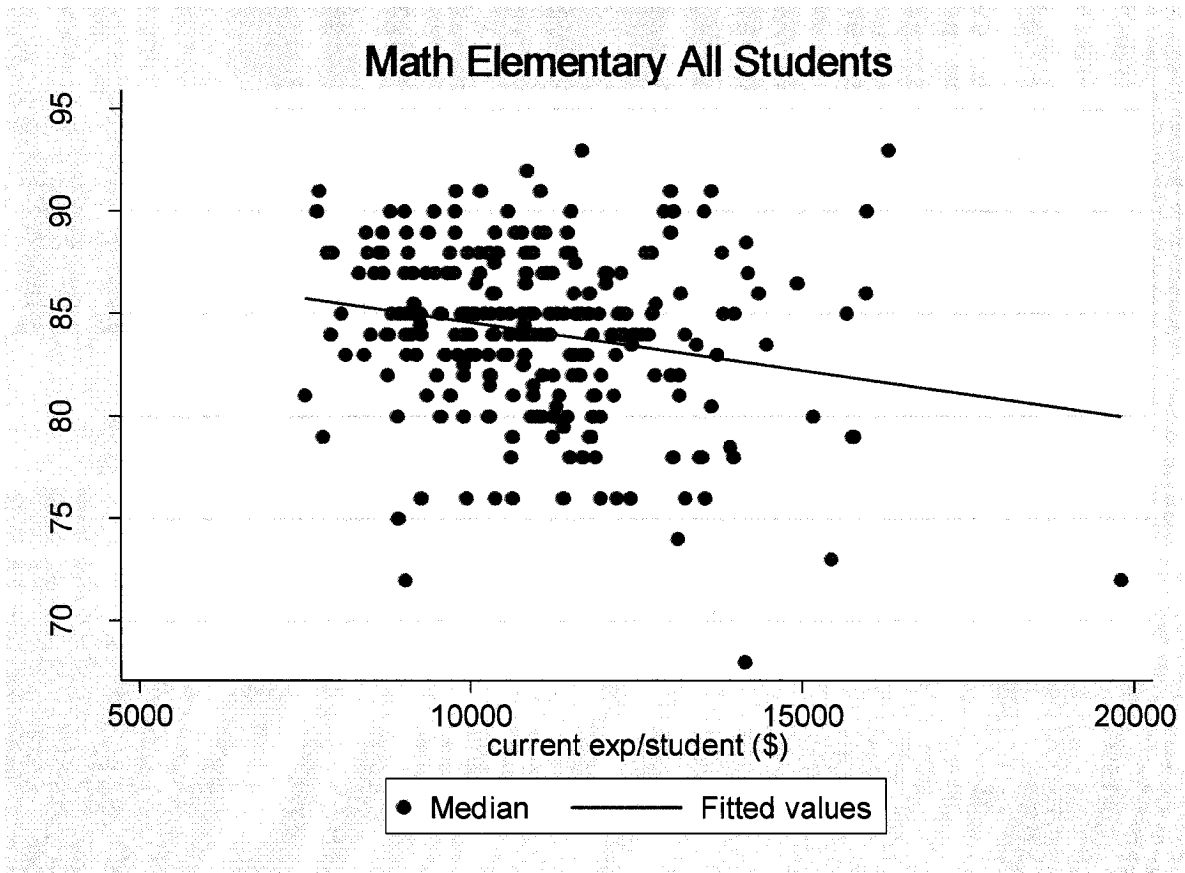
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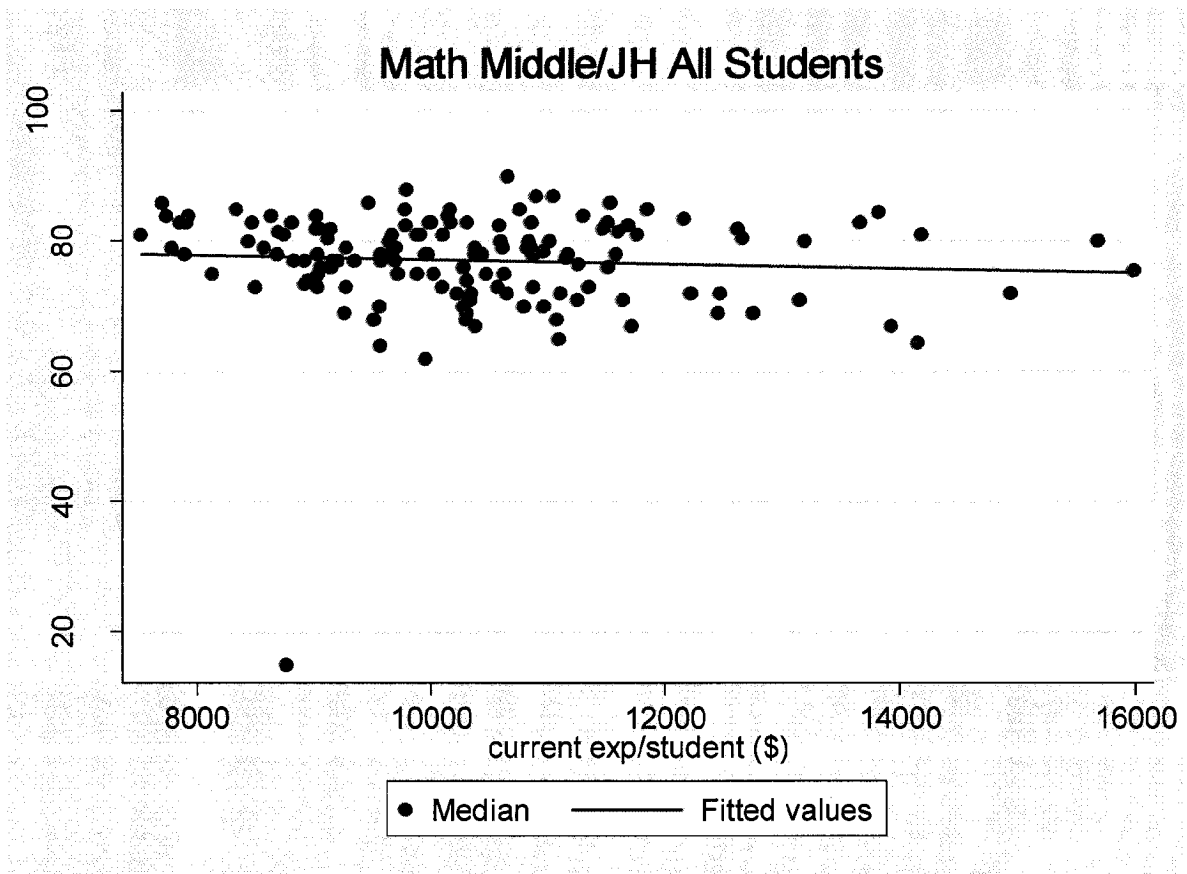
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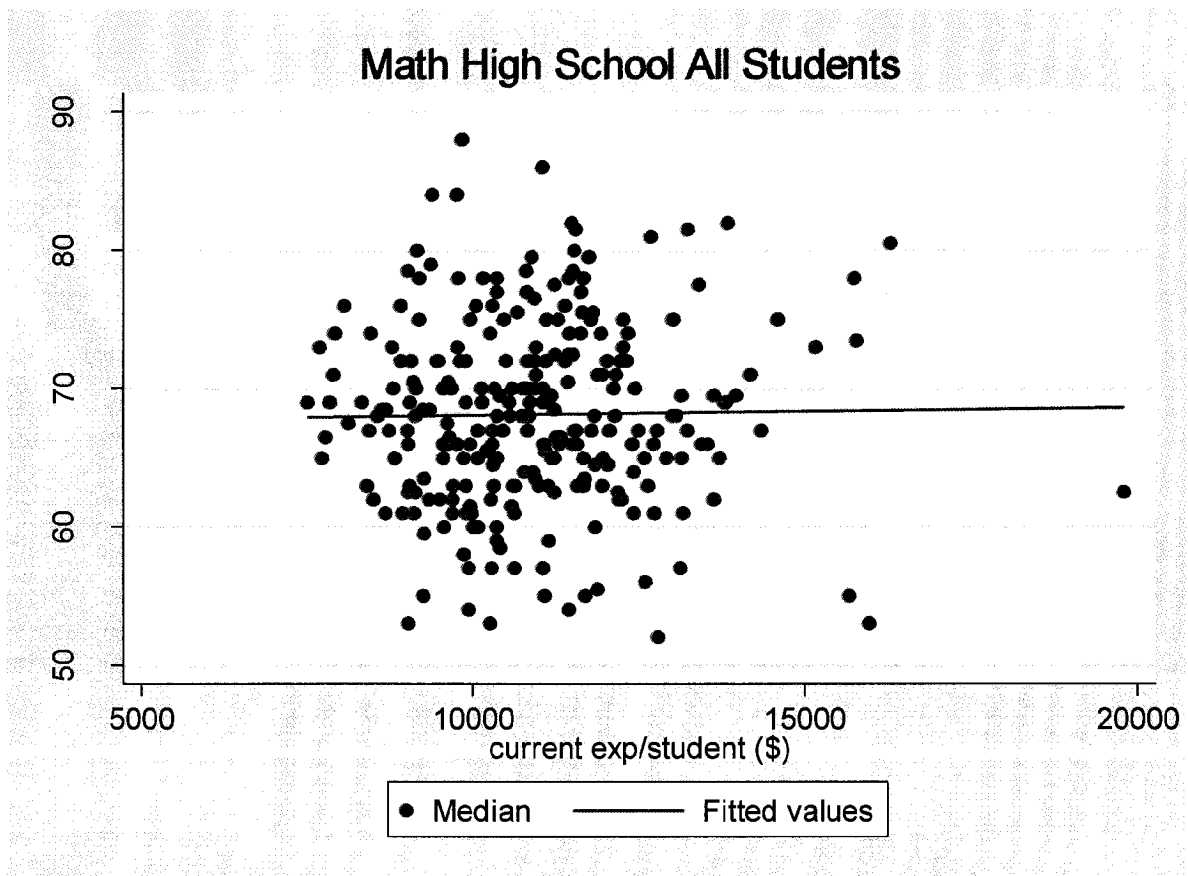
All Students

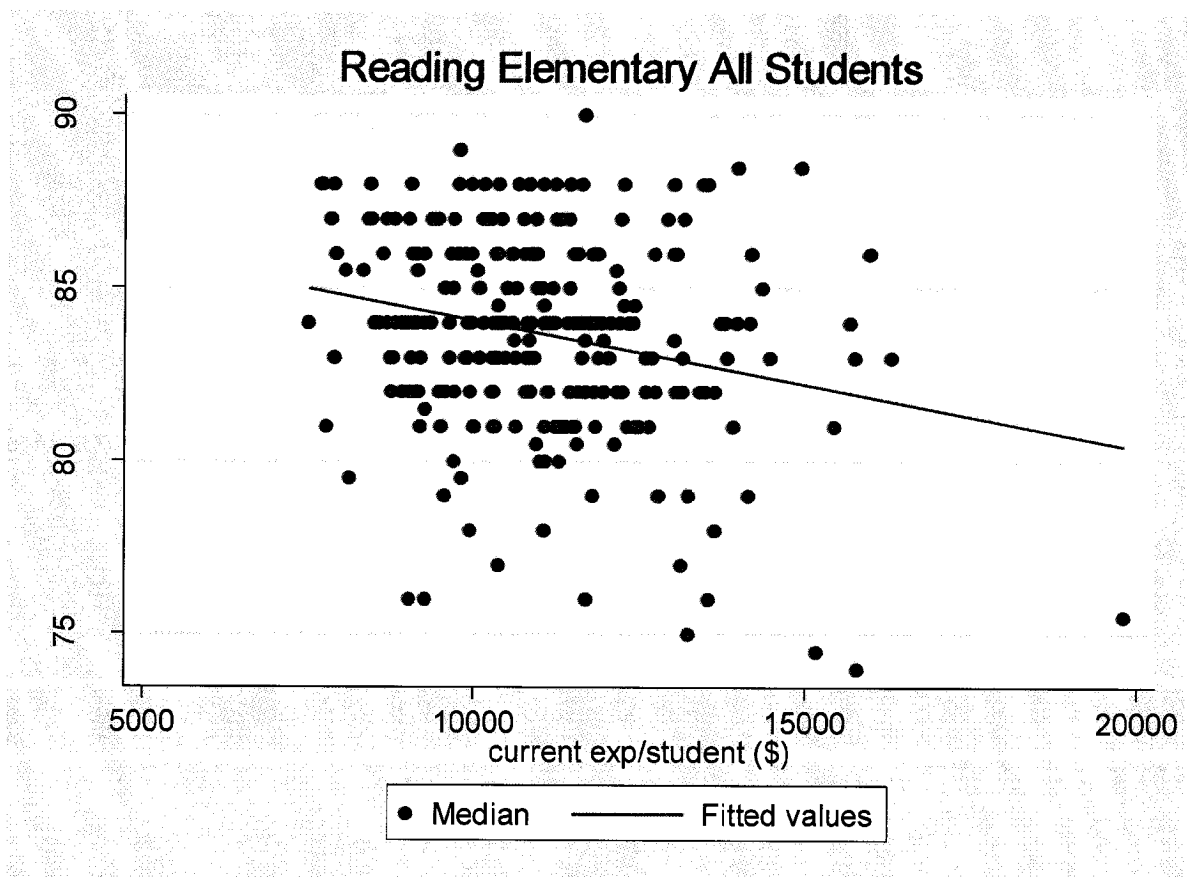
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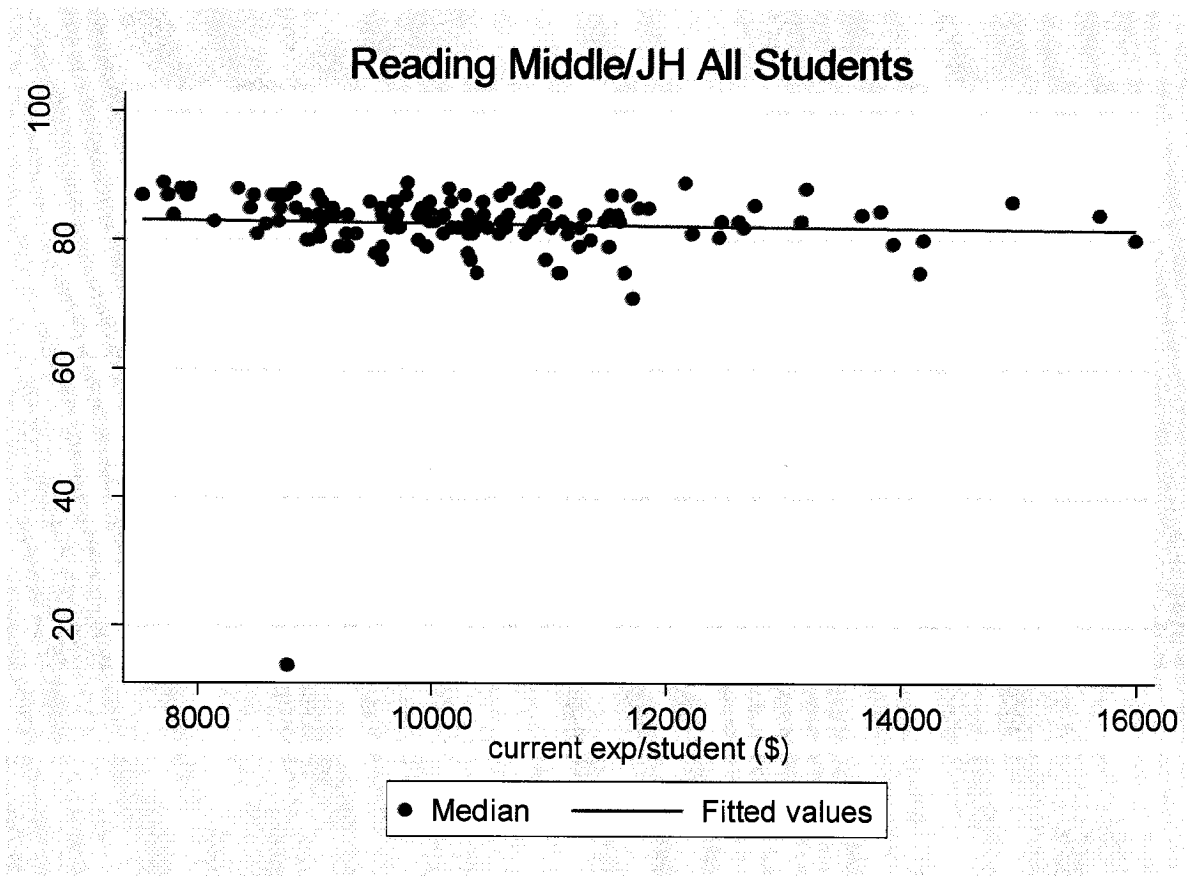
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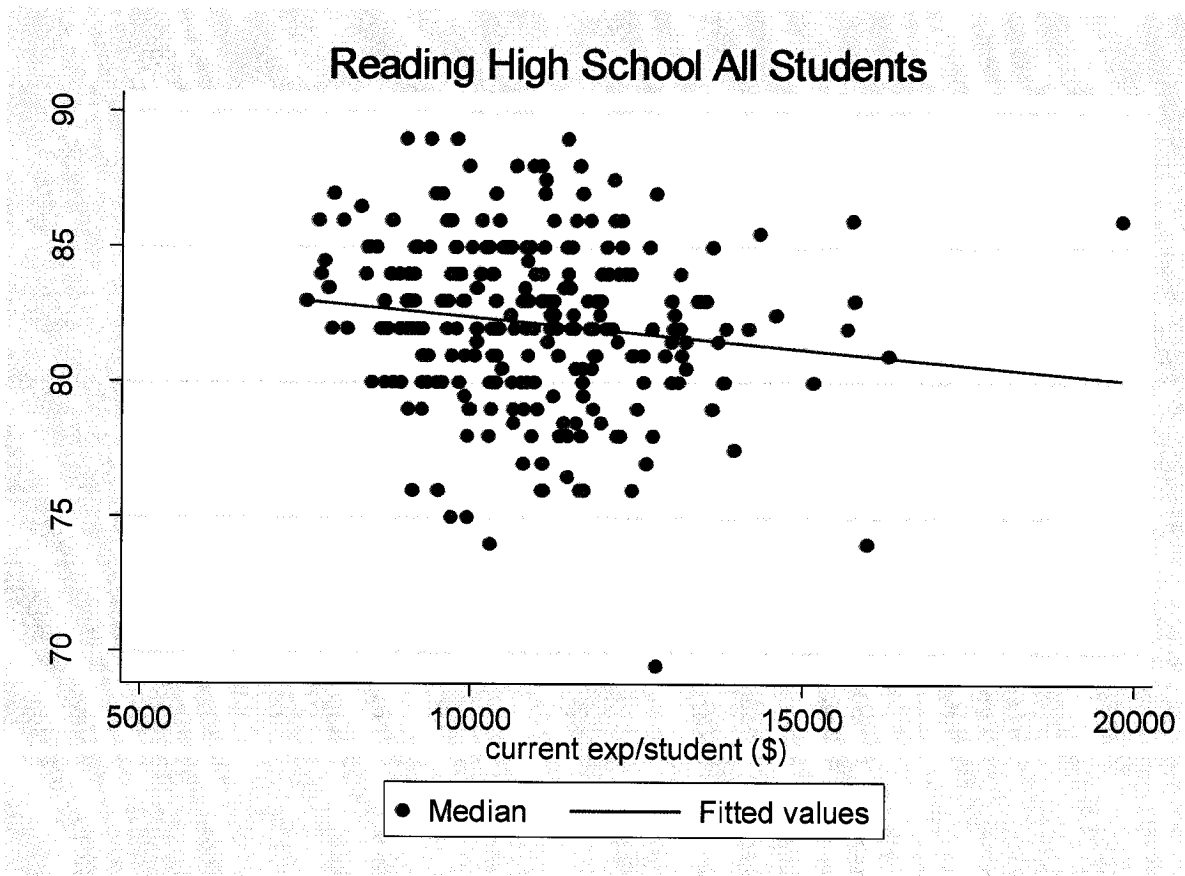


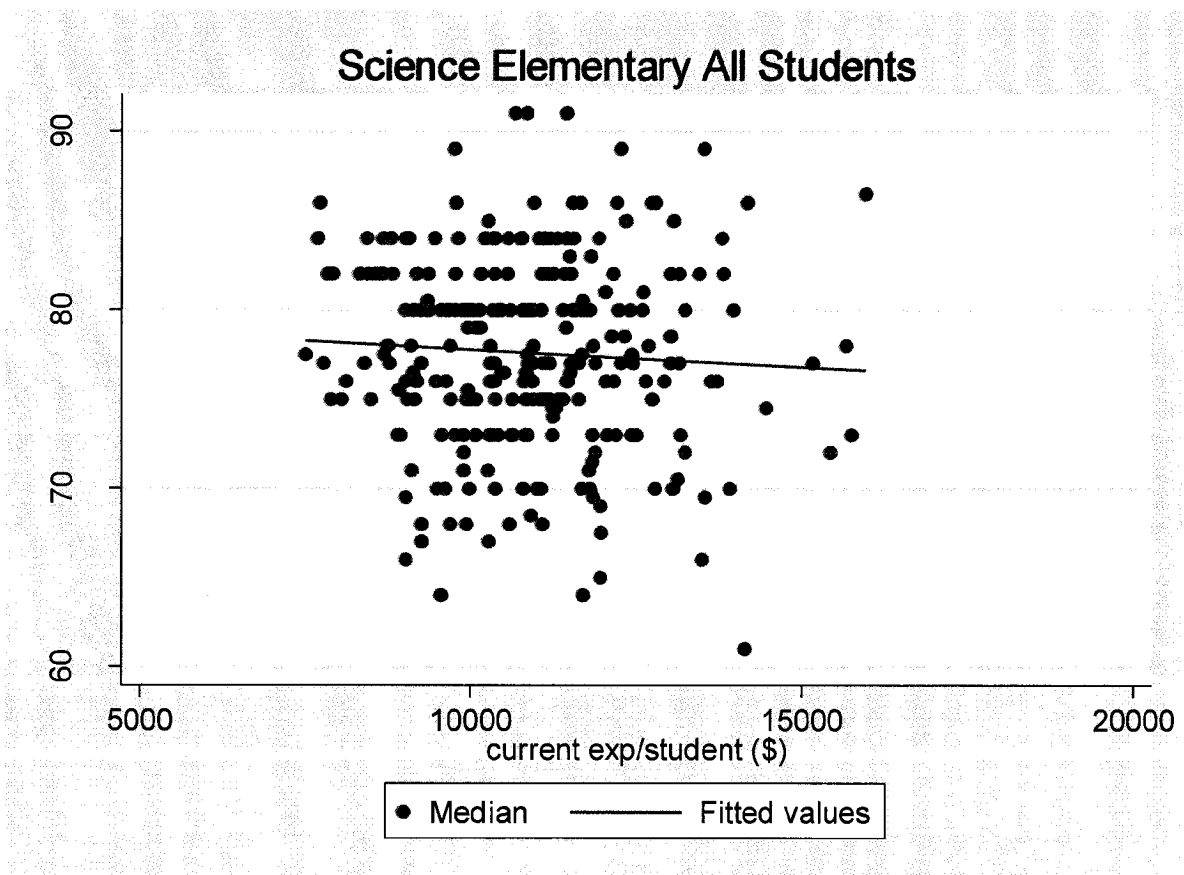


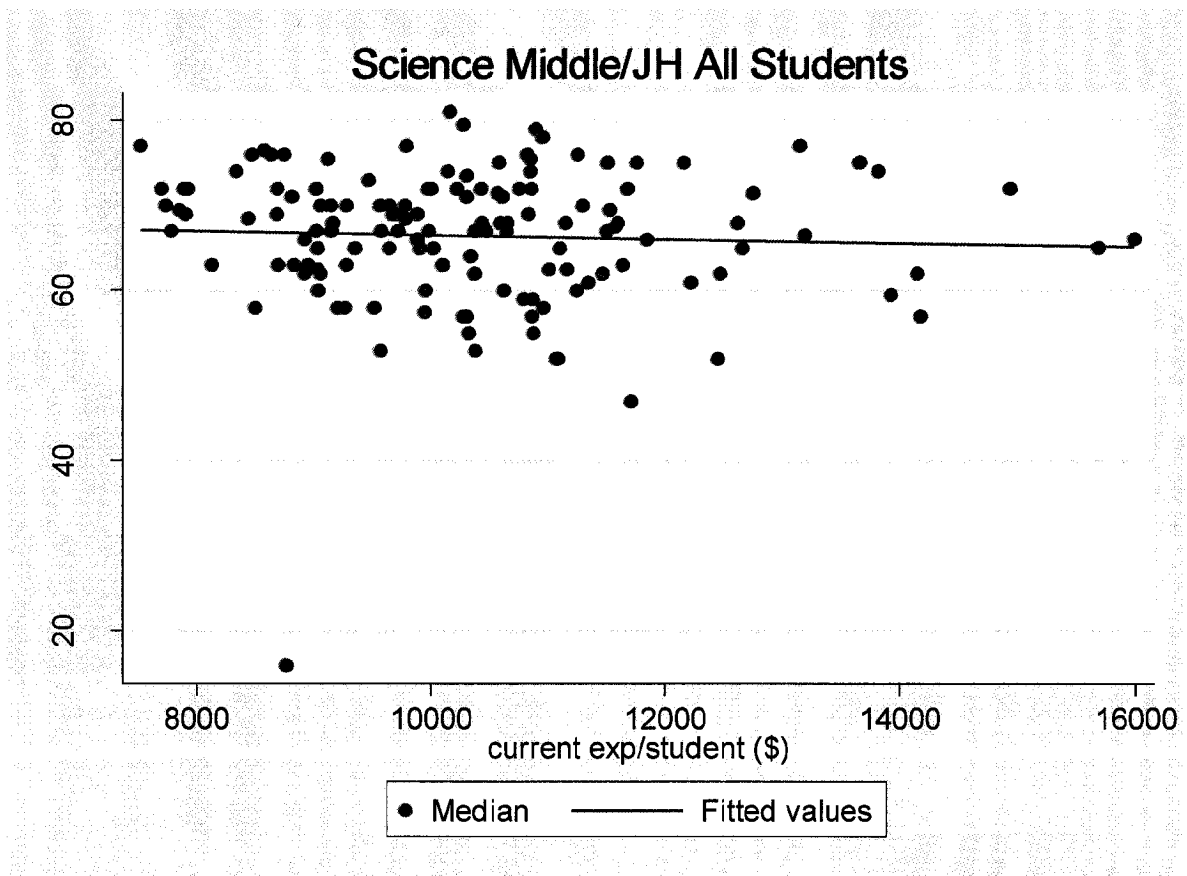


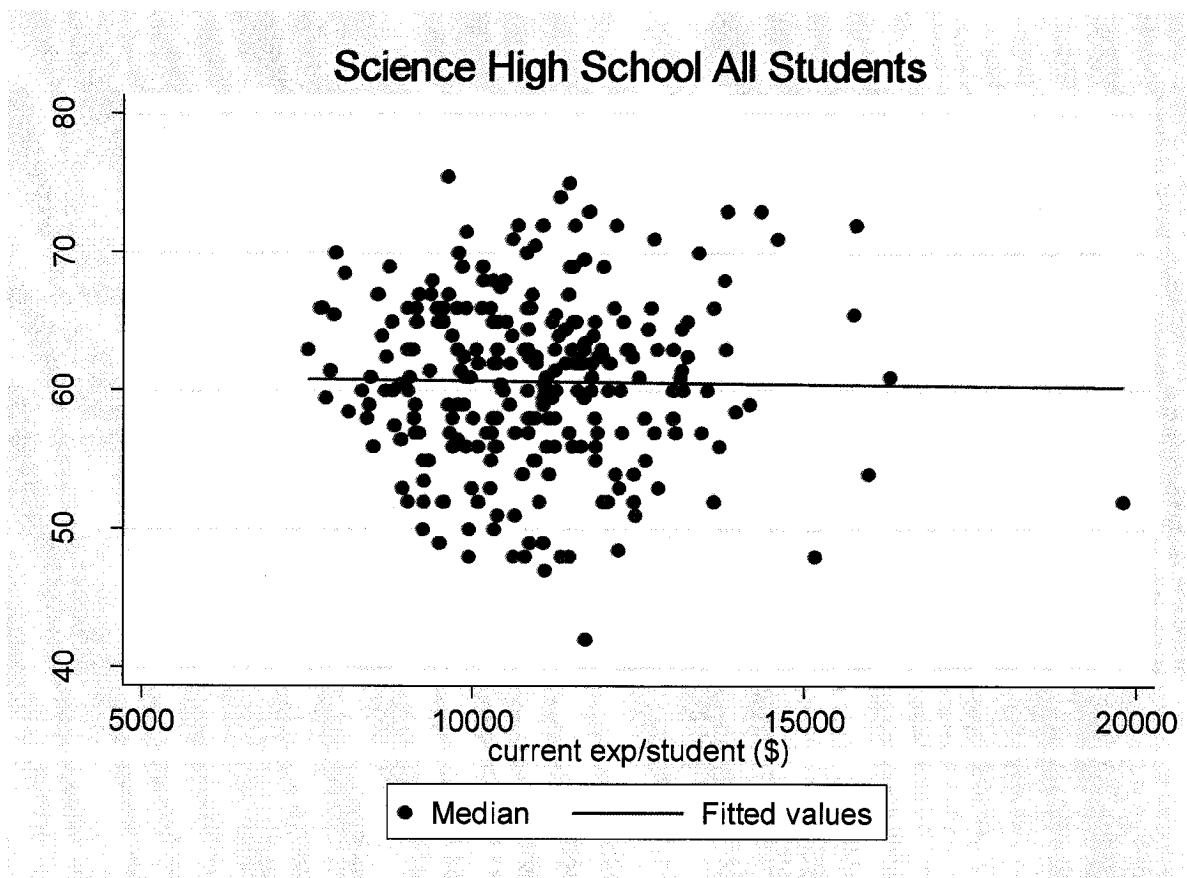








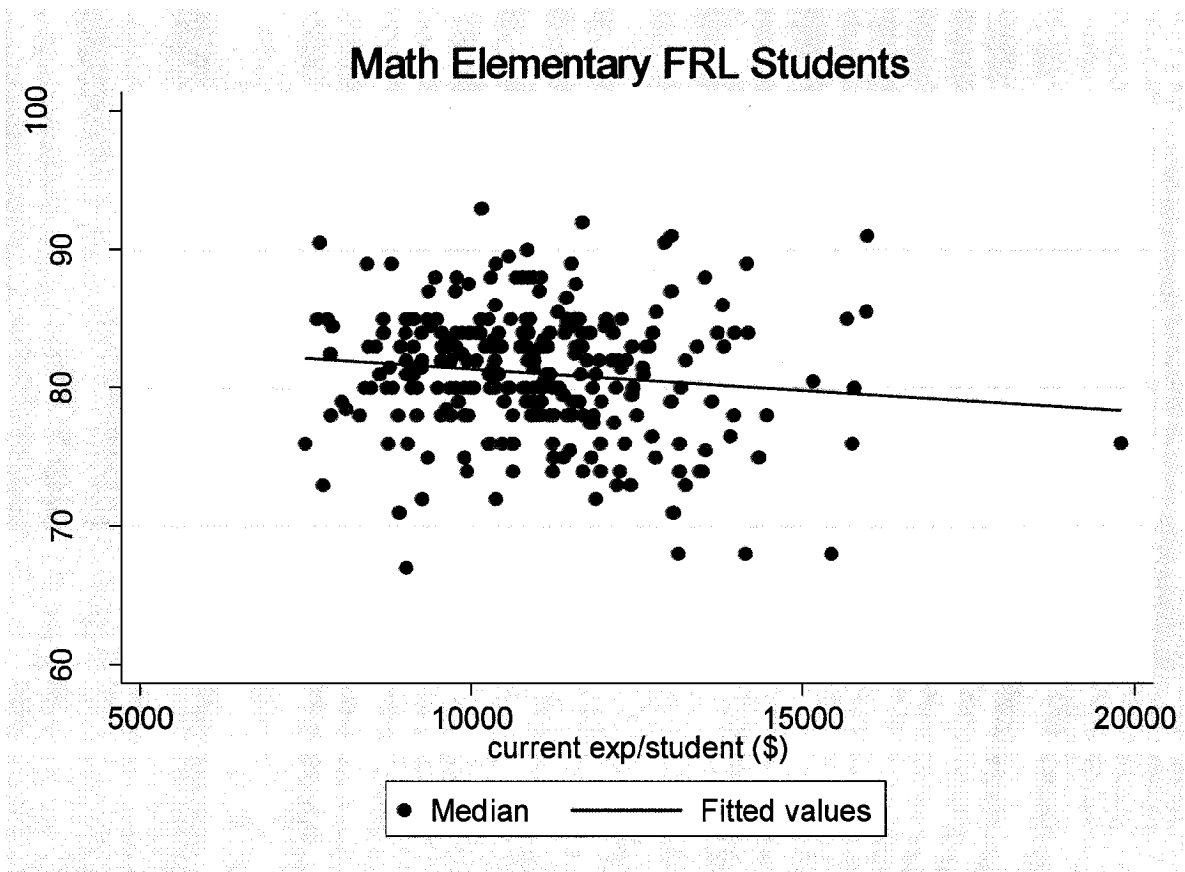


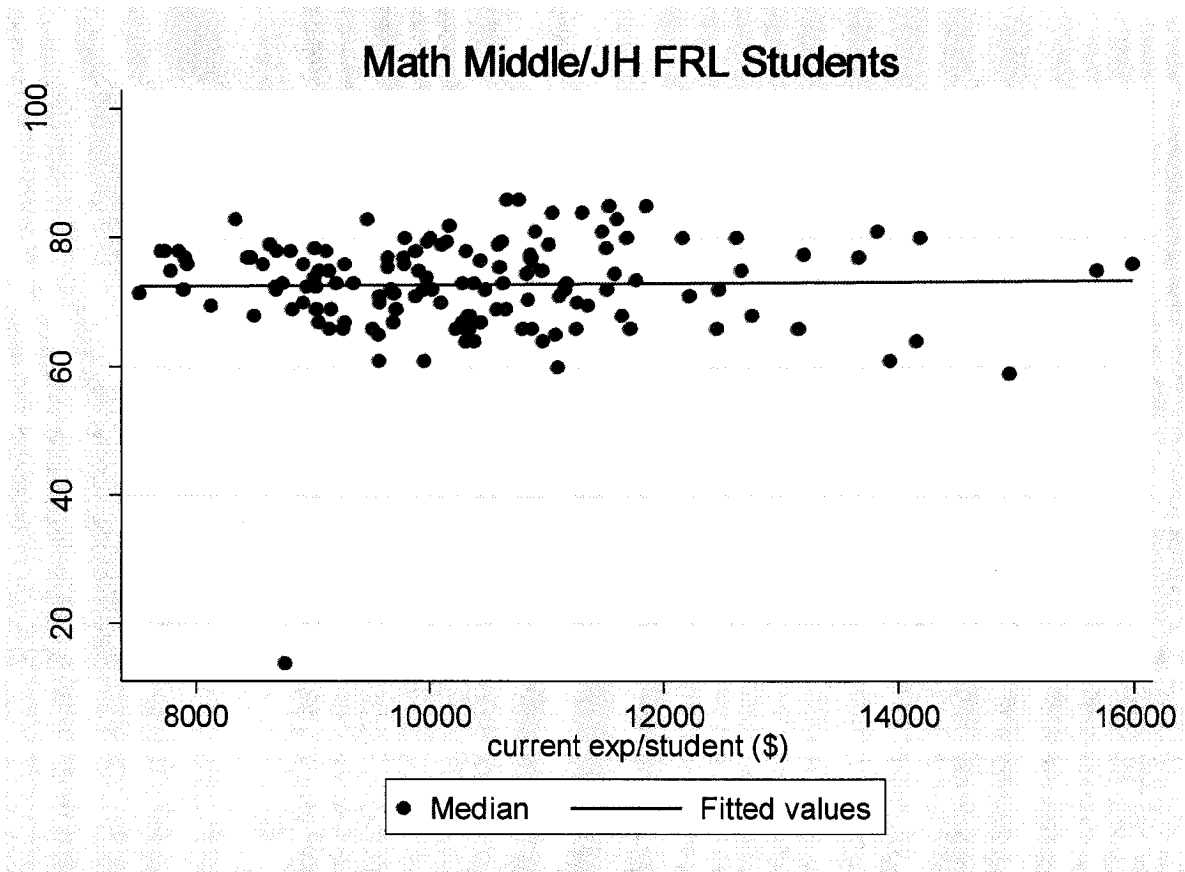


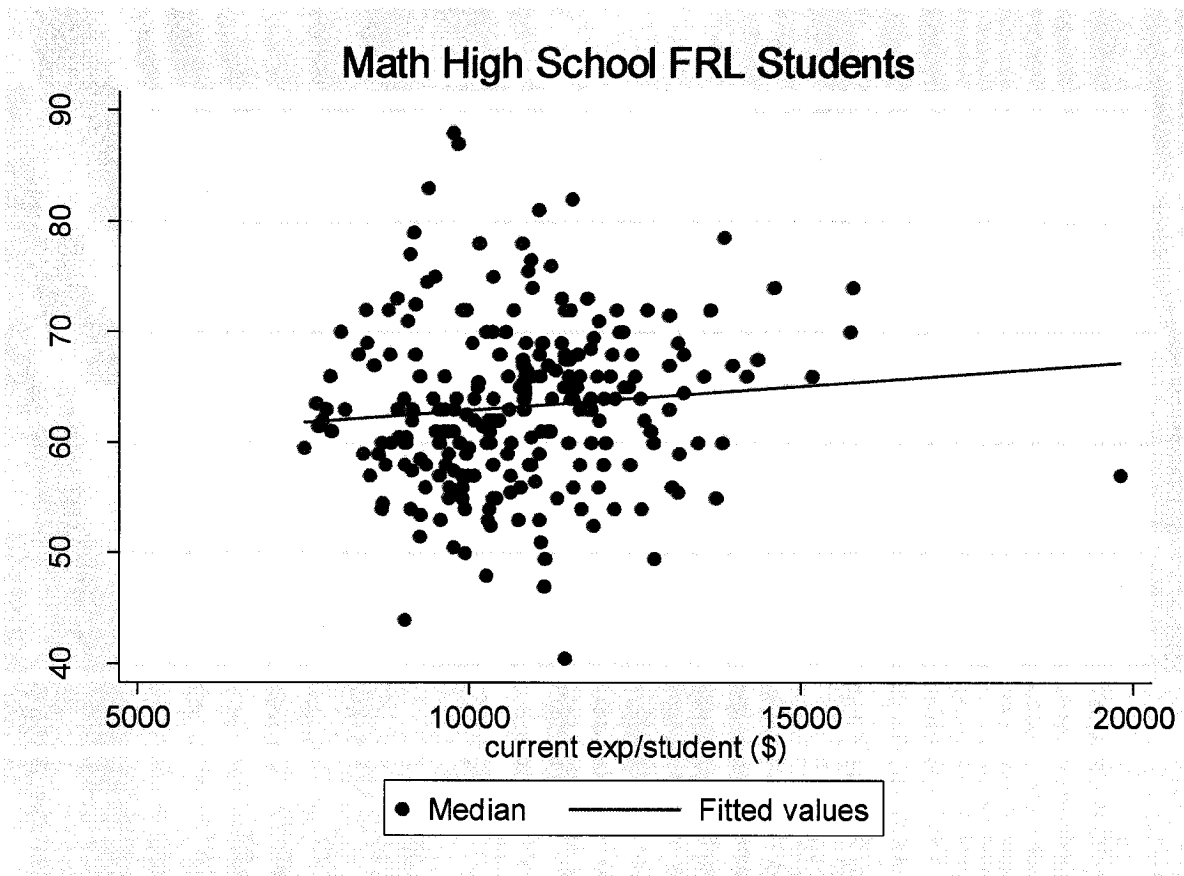
FRL-Eligible Students

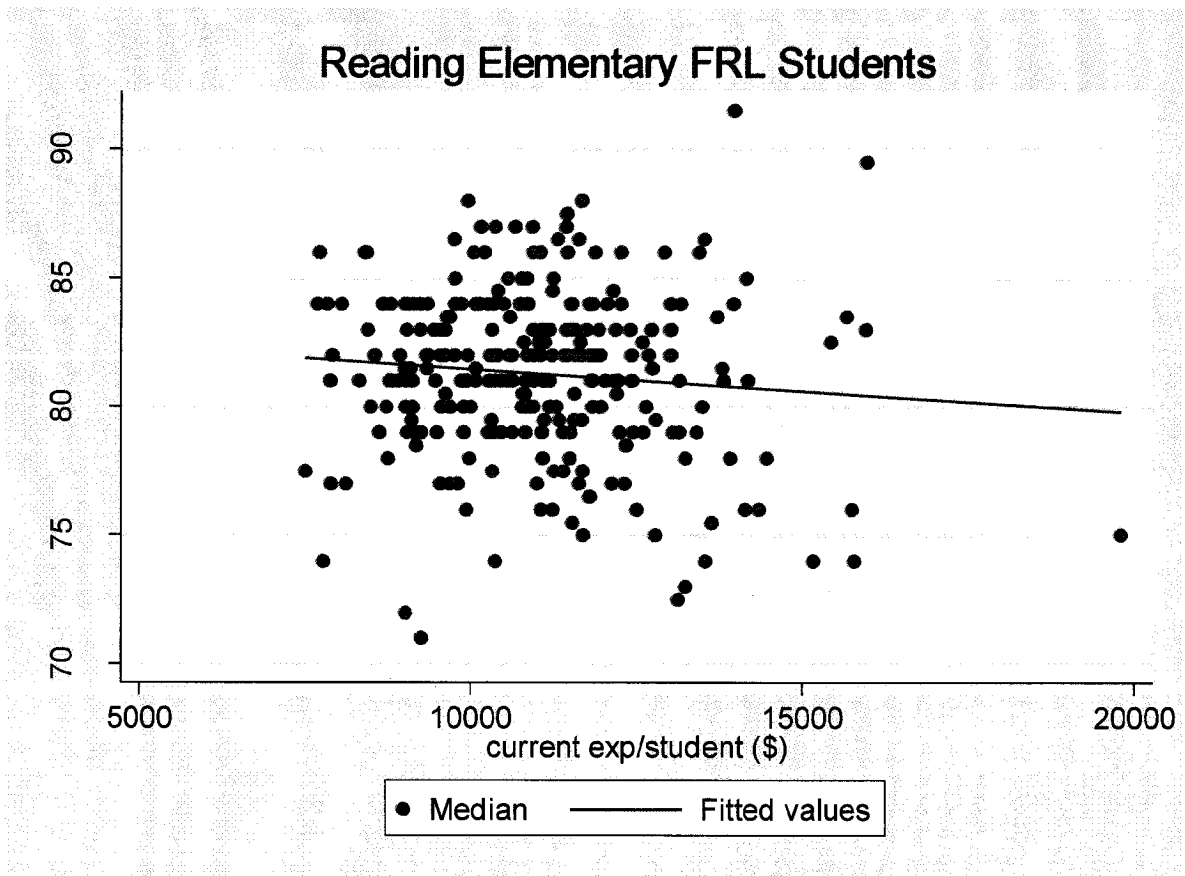
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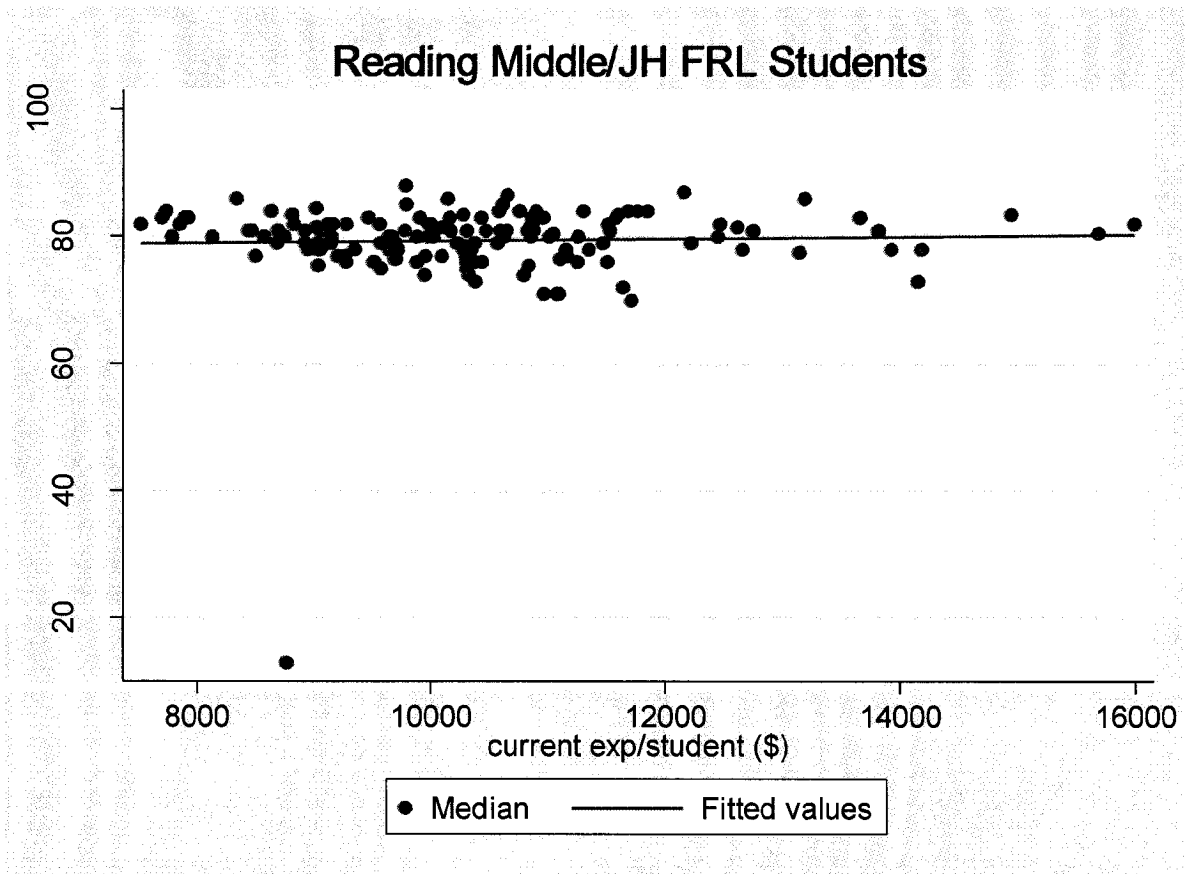
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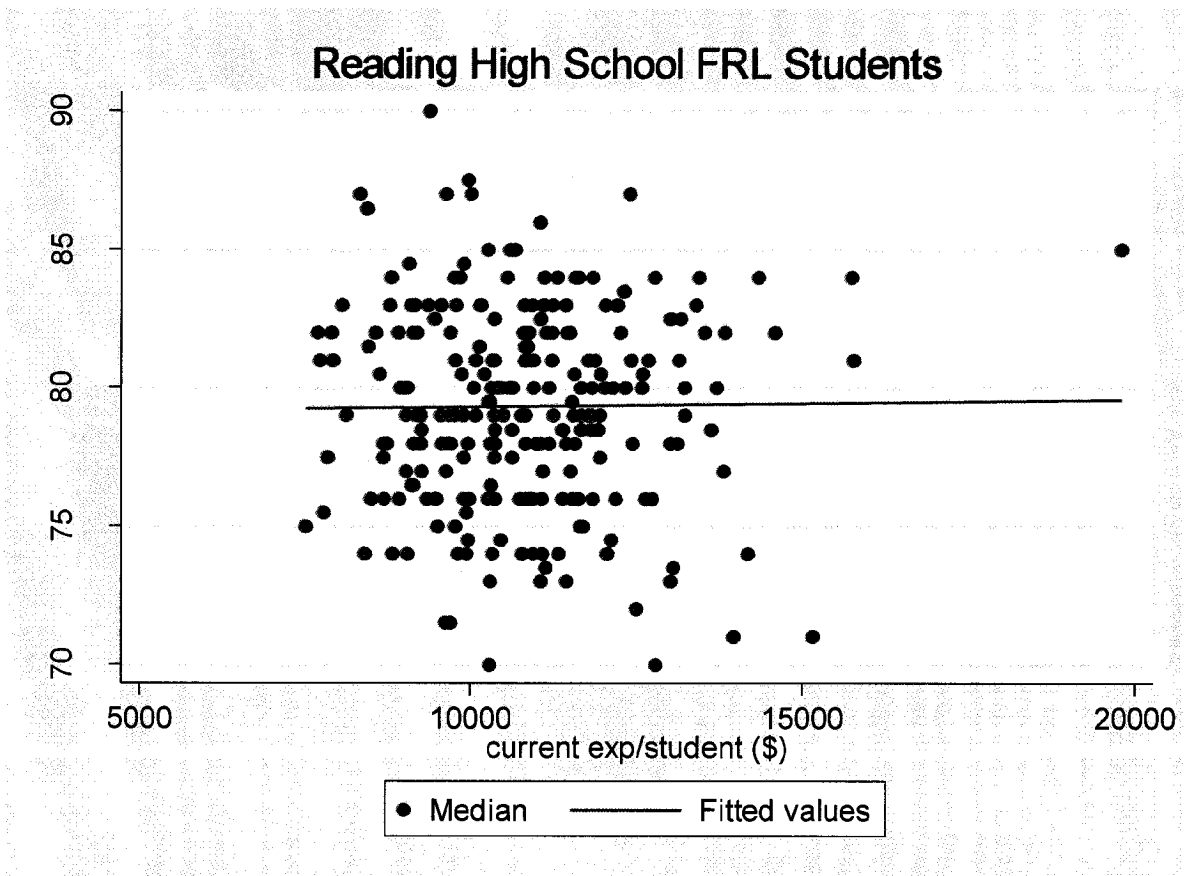


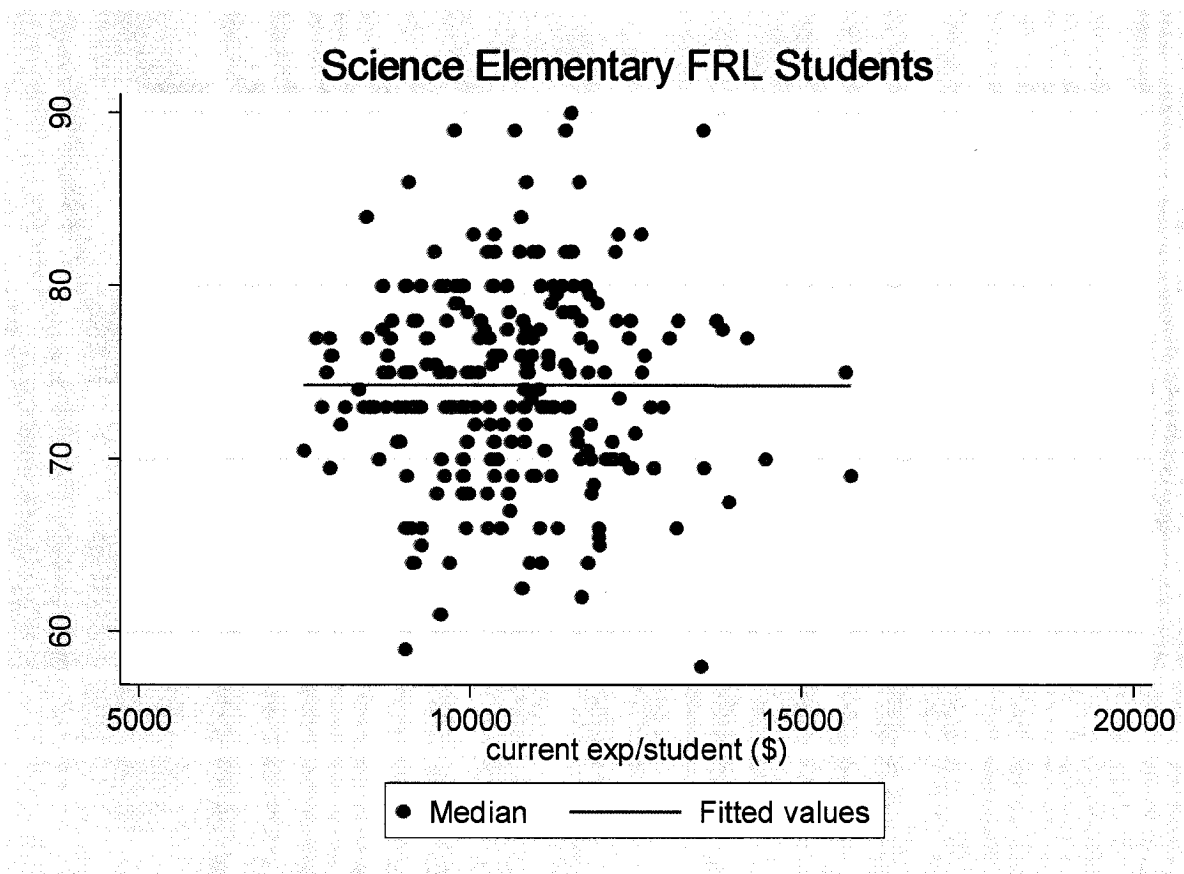


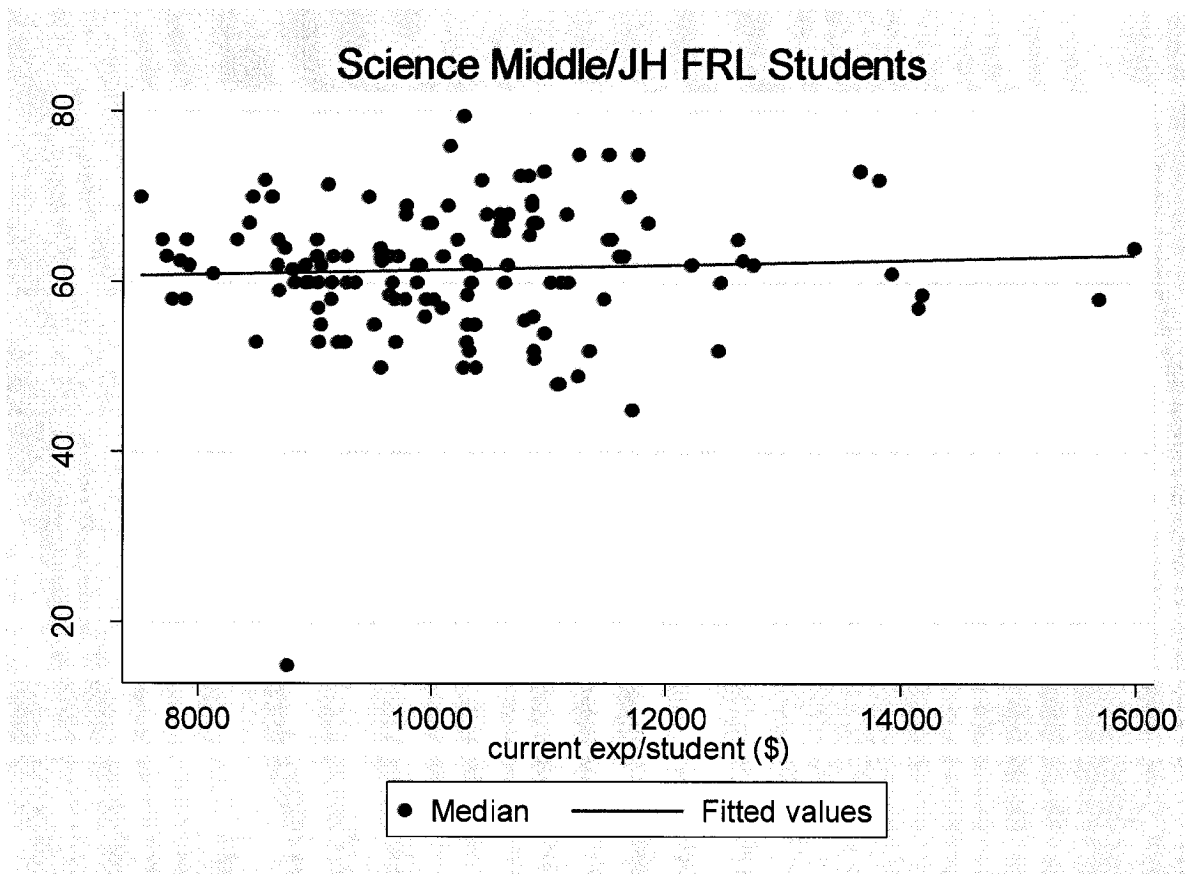


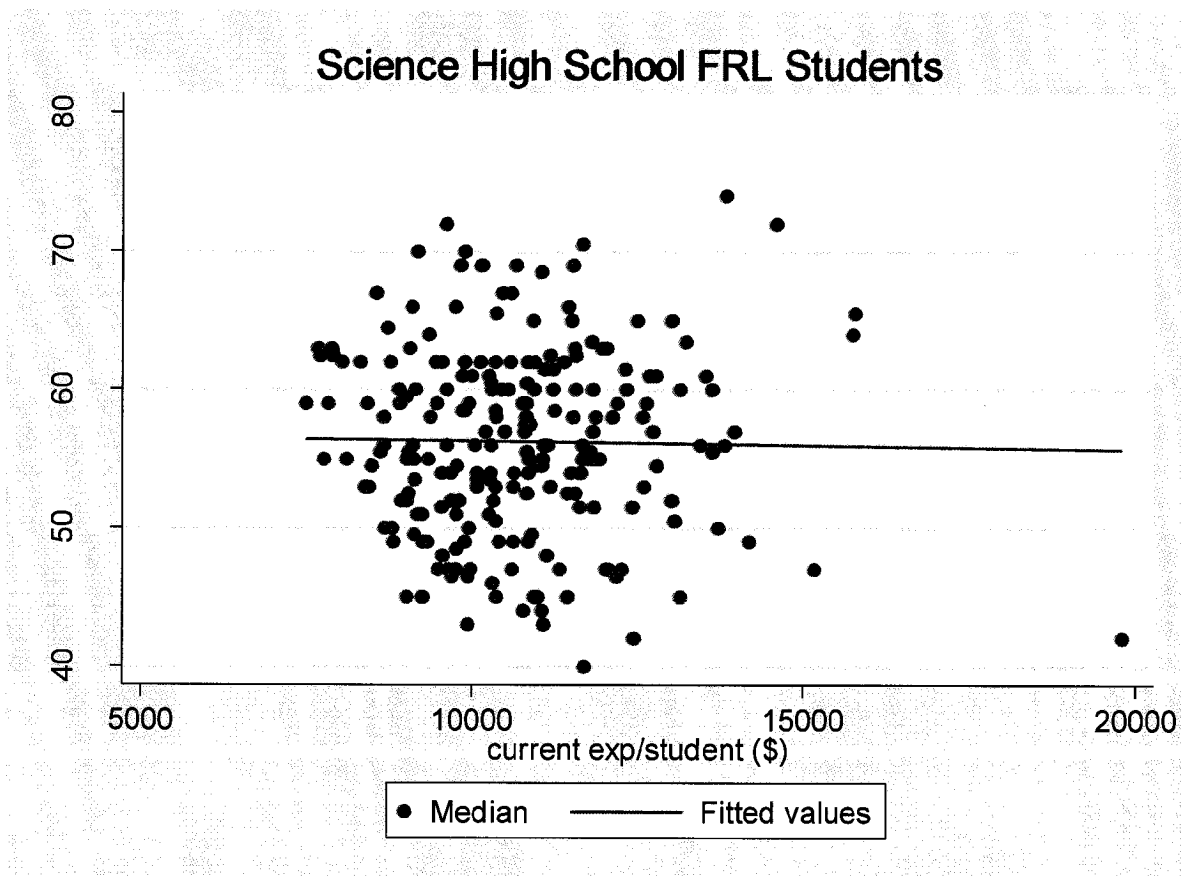








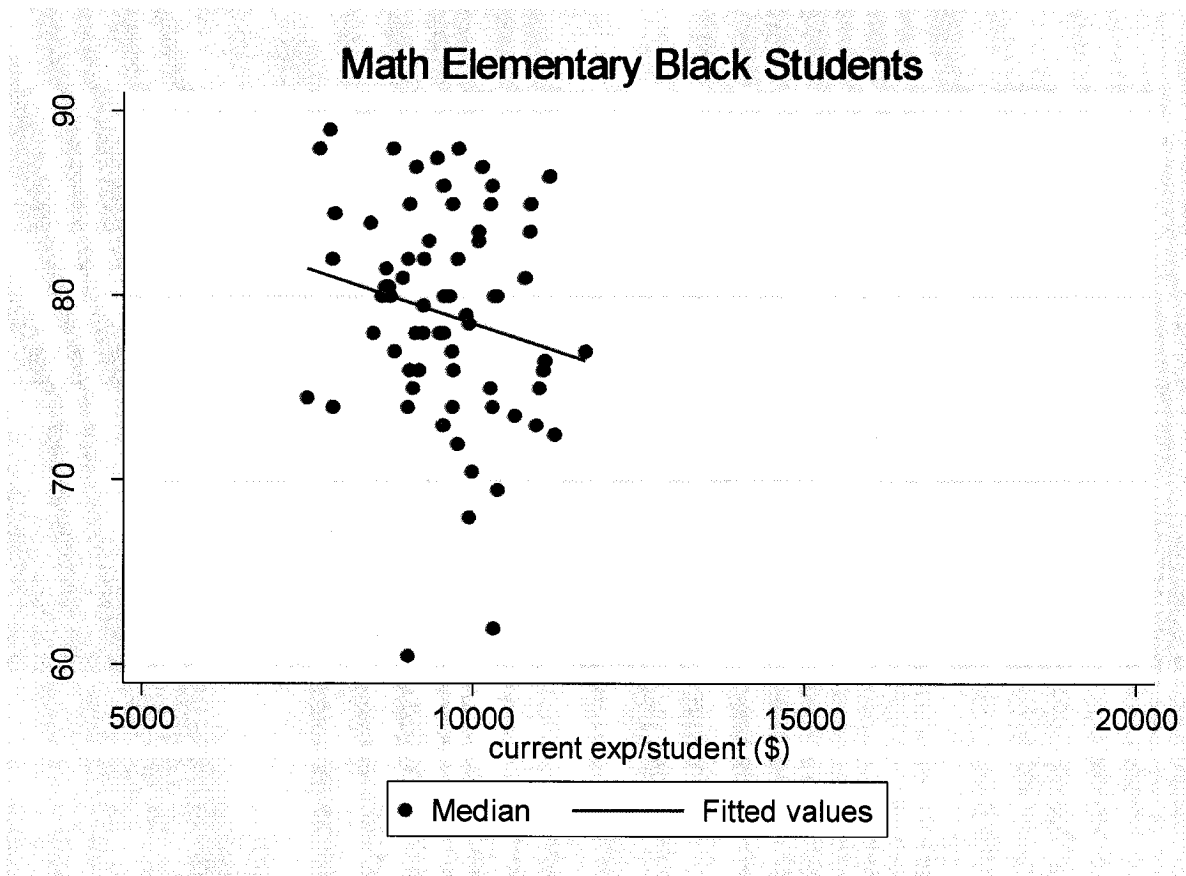


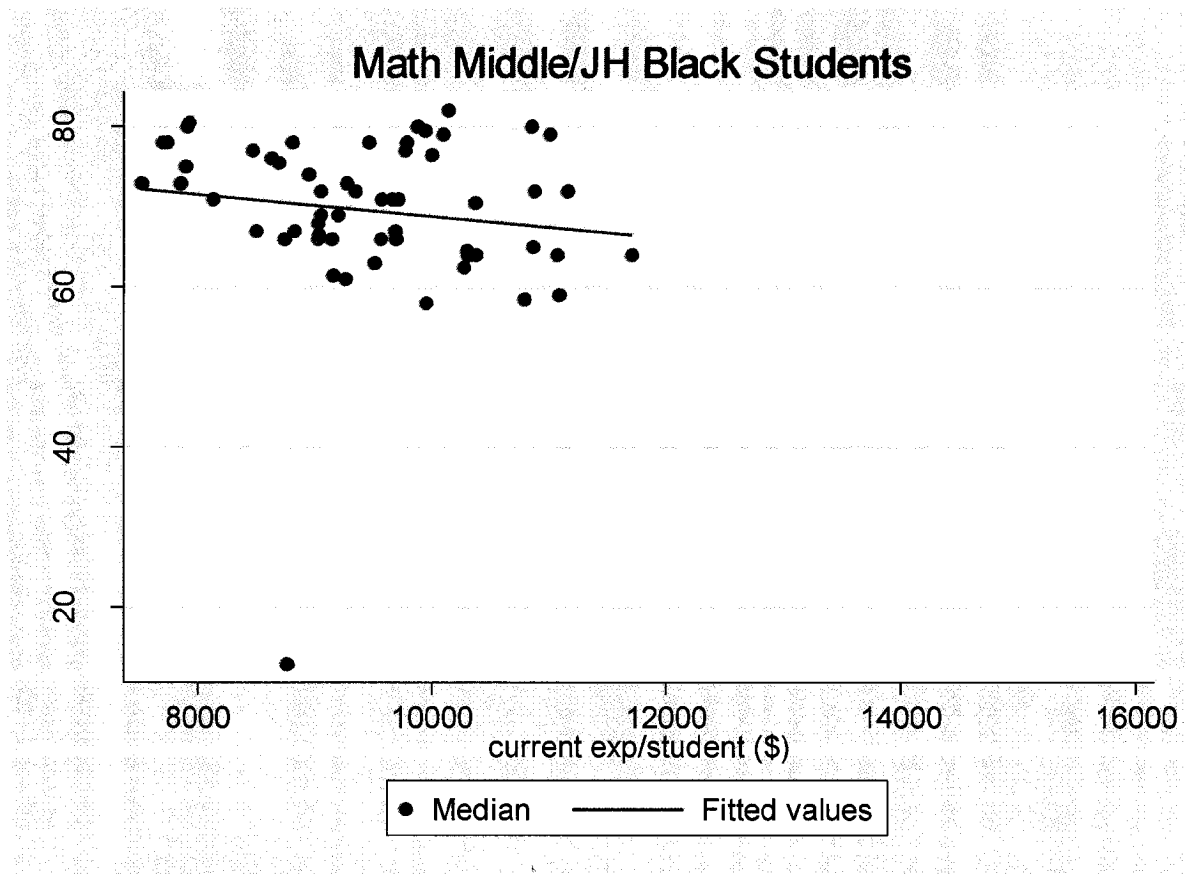


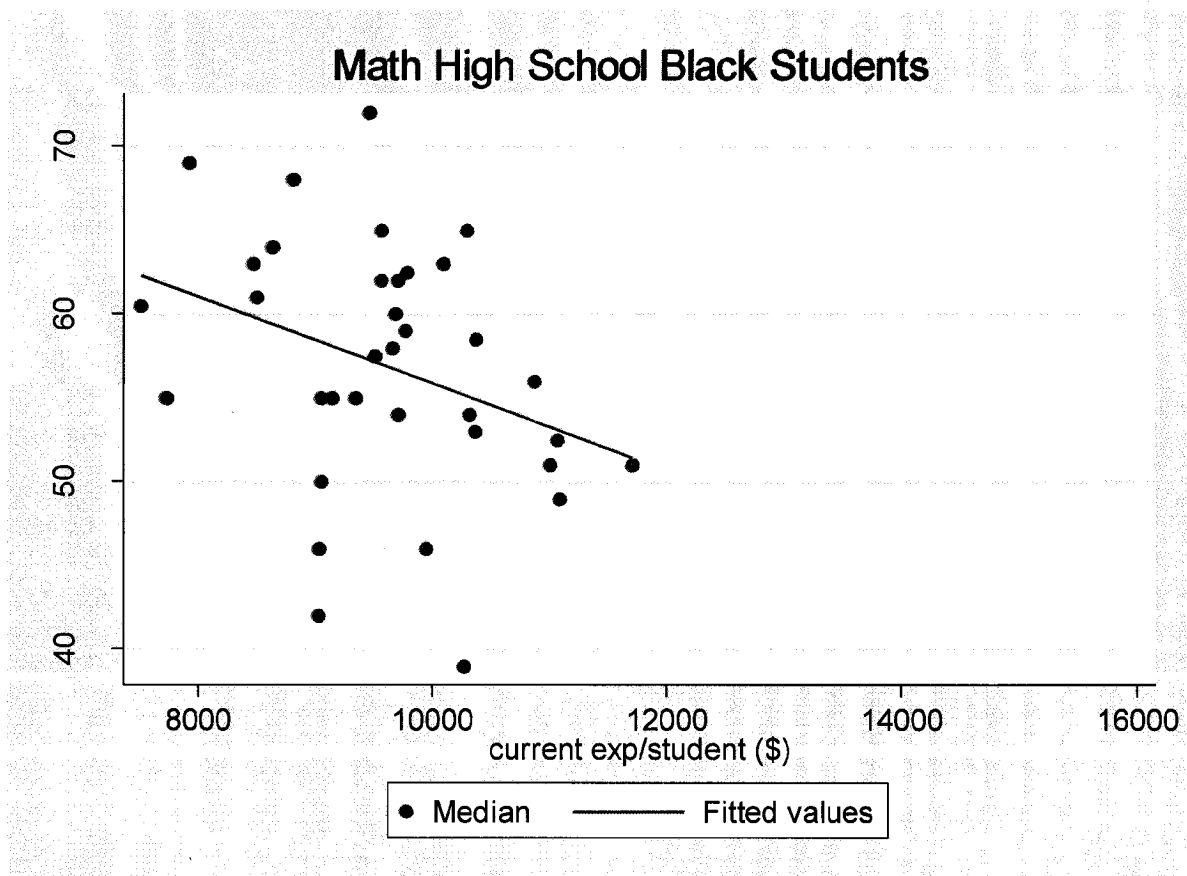
Black Students

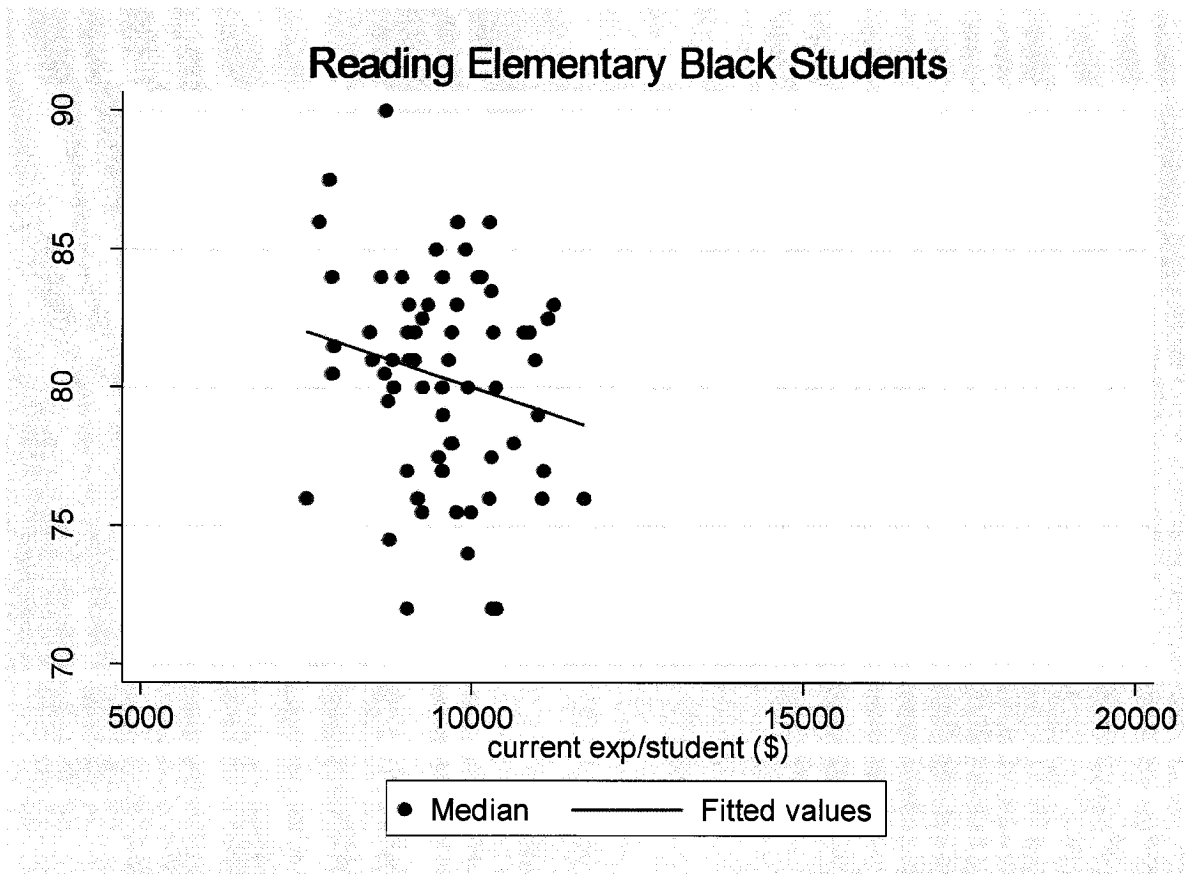
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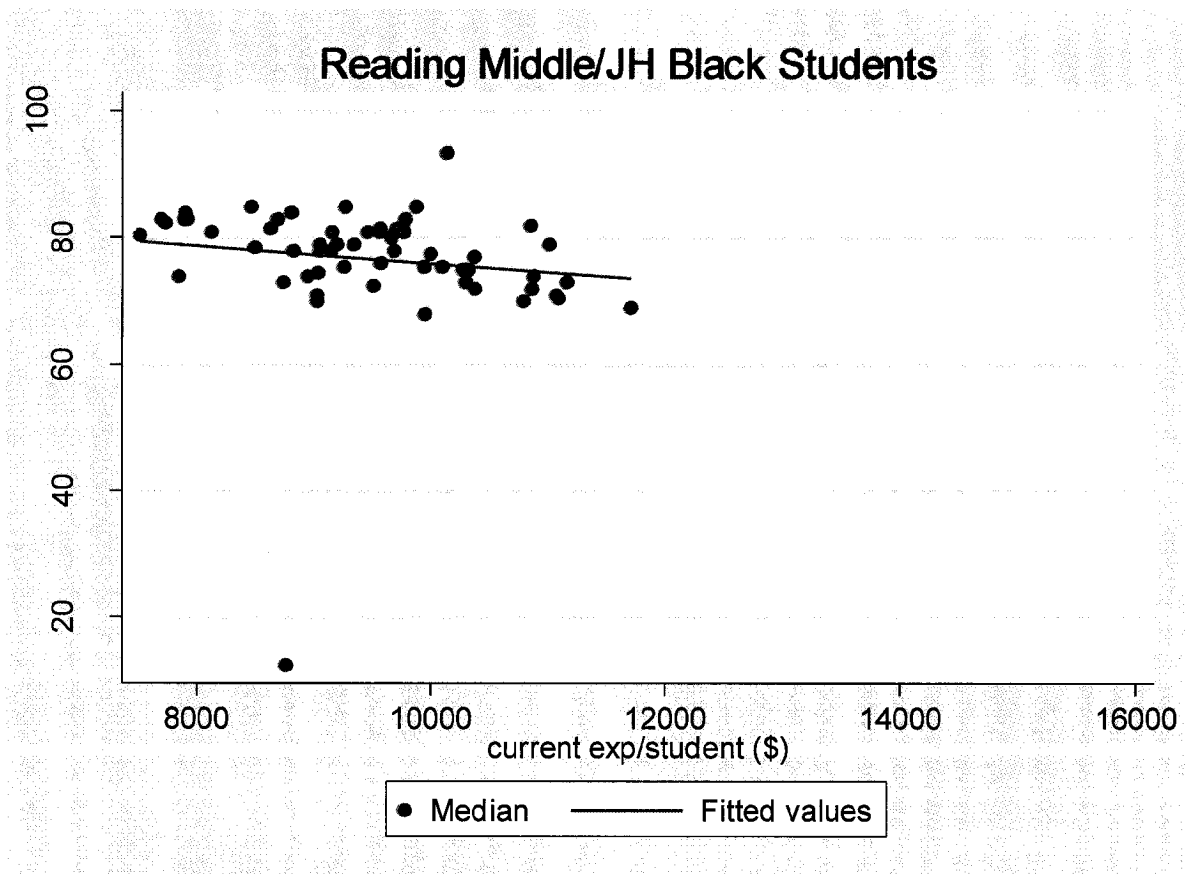
3 Assessments (Math, Reading, Science)

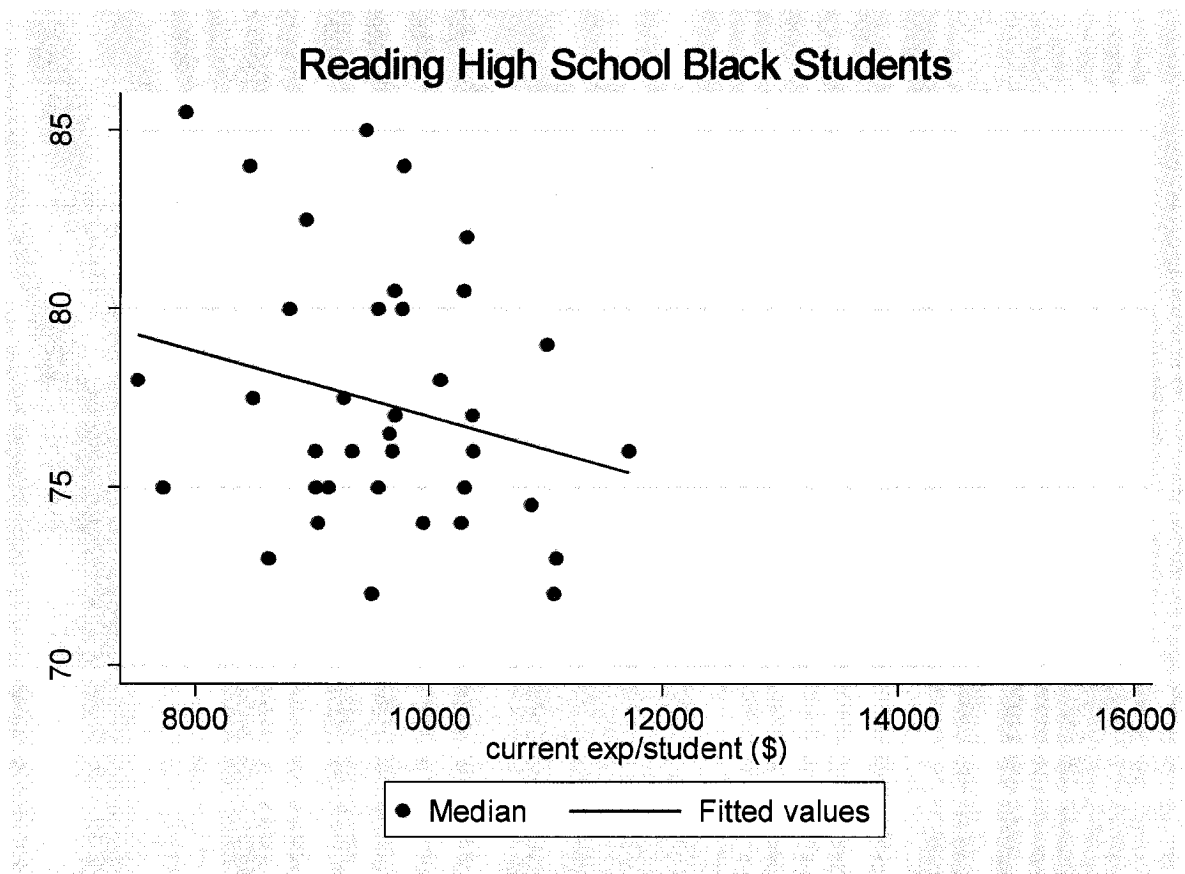


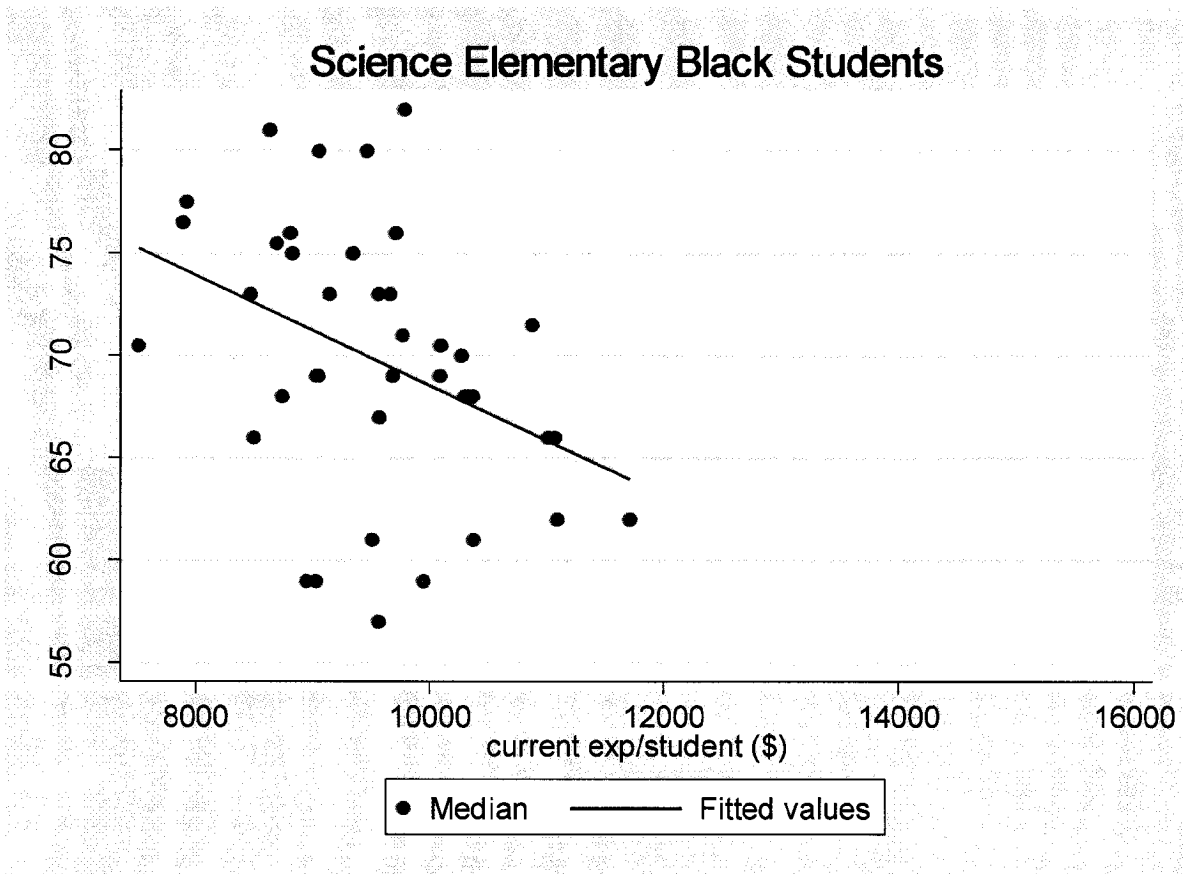


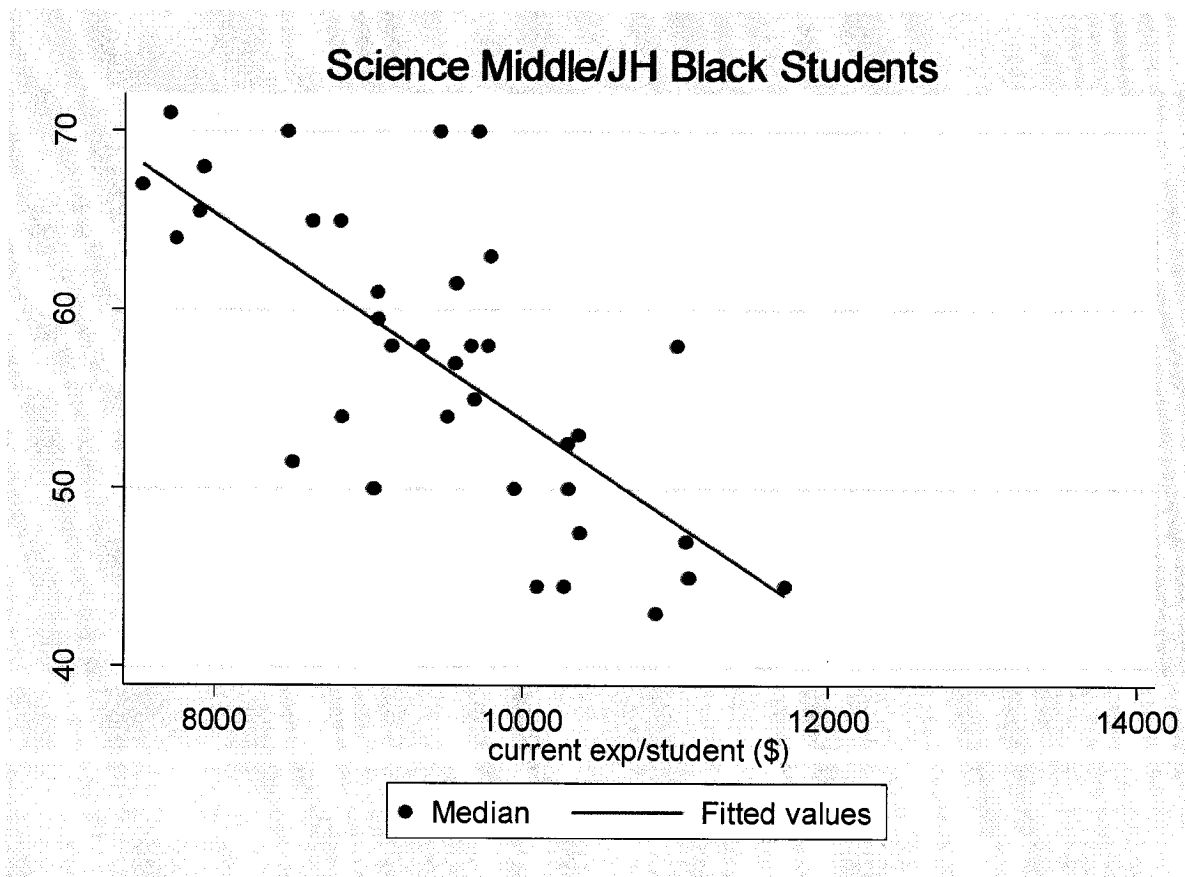


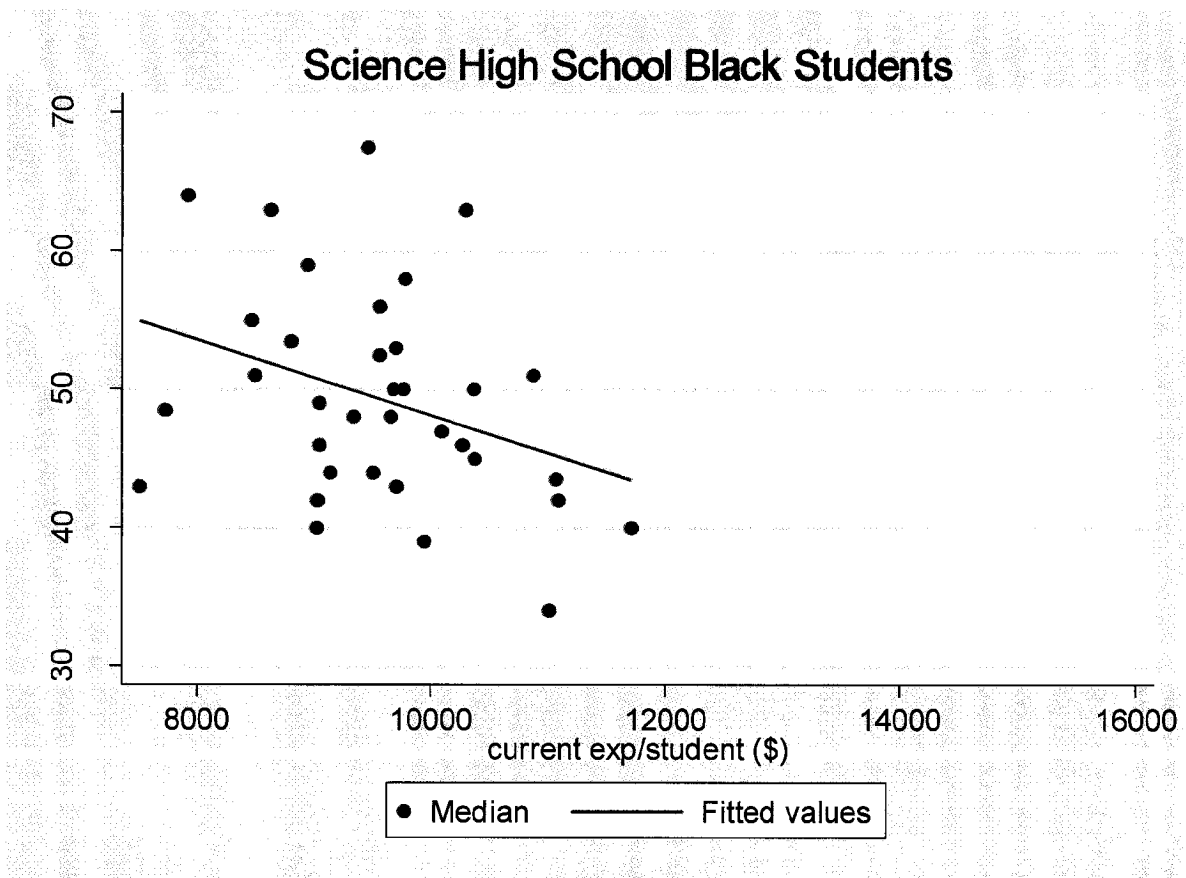








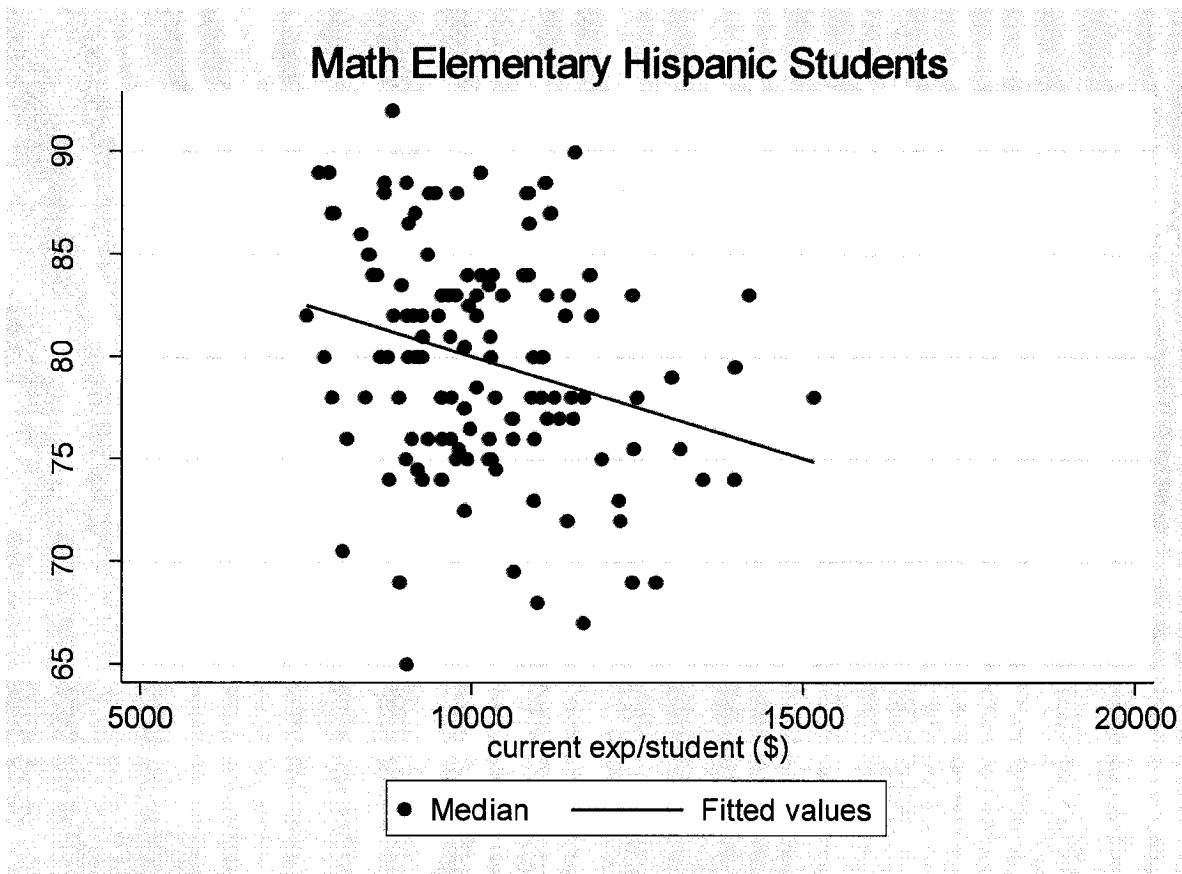


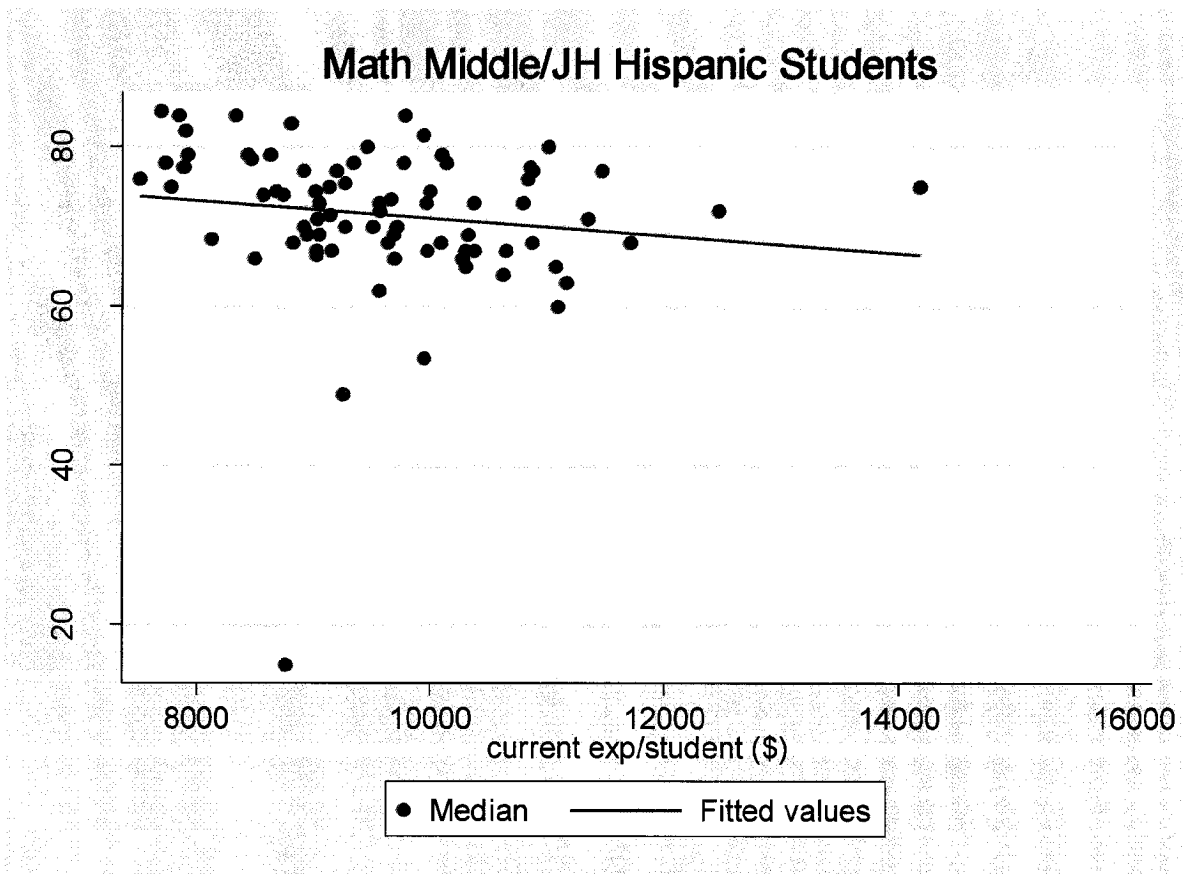


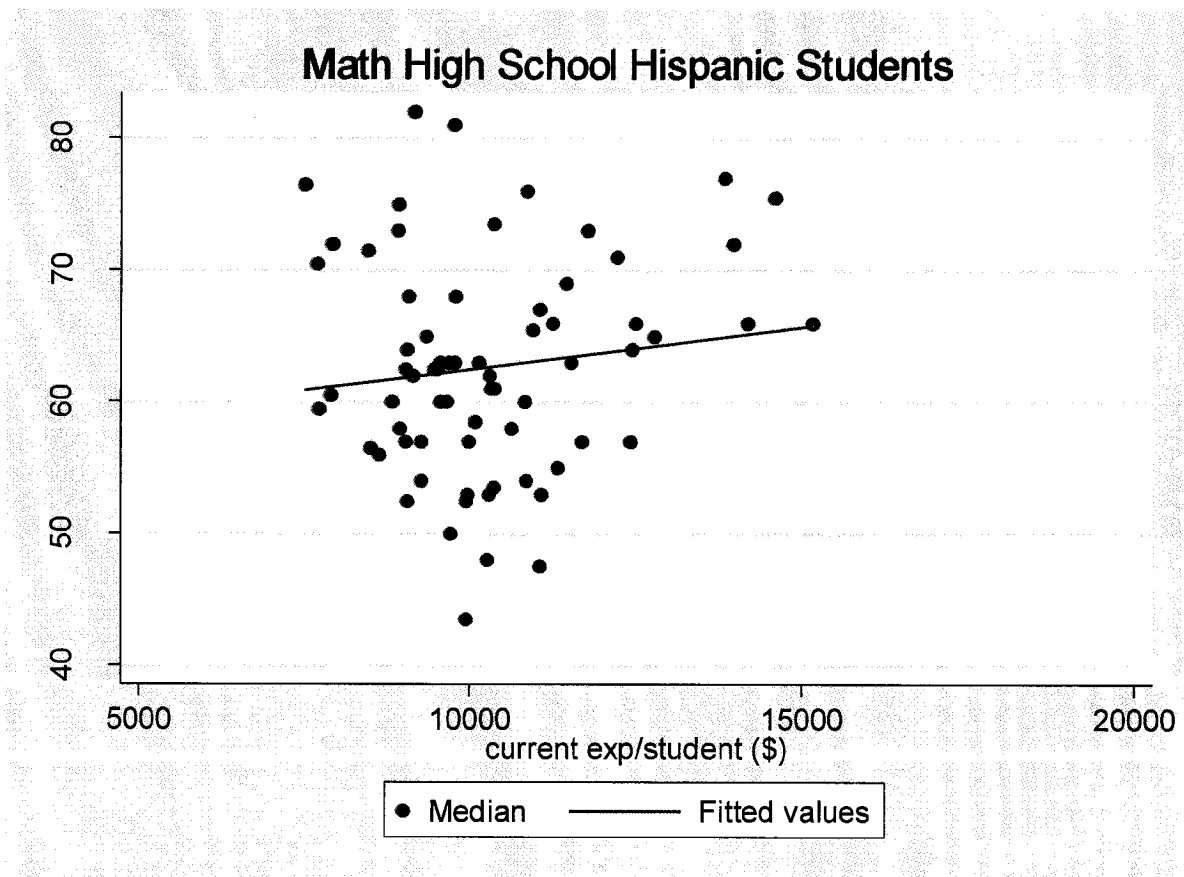
Hispanic Students

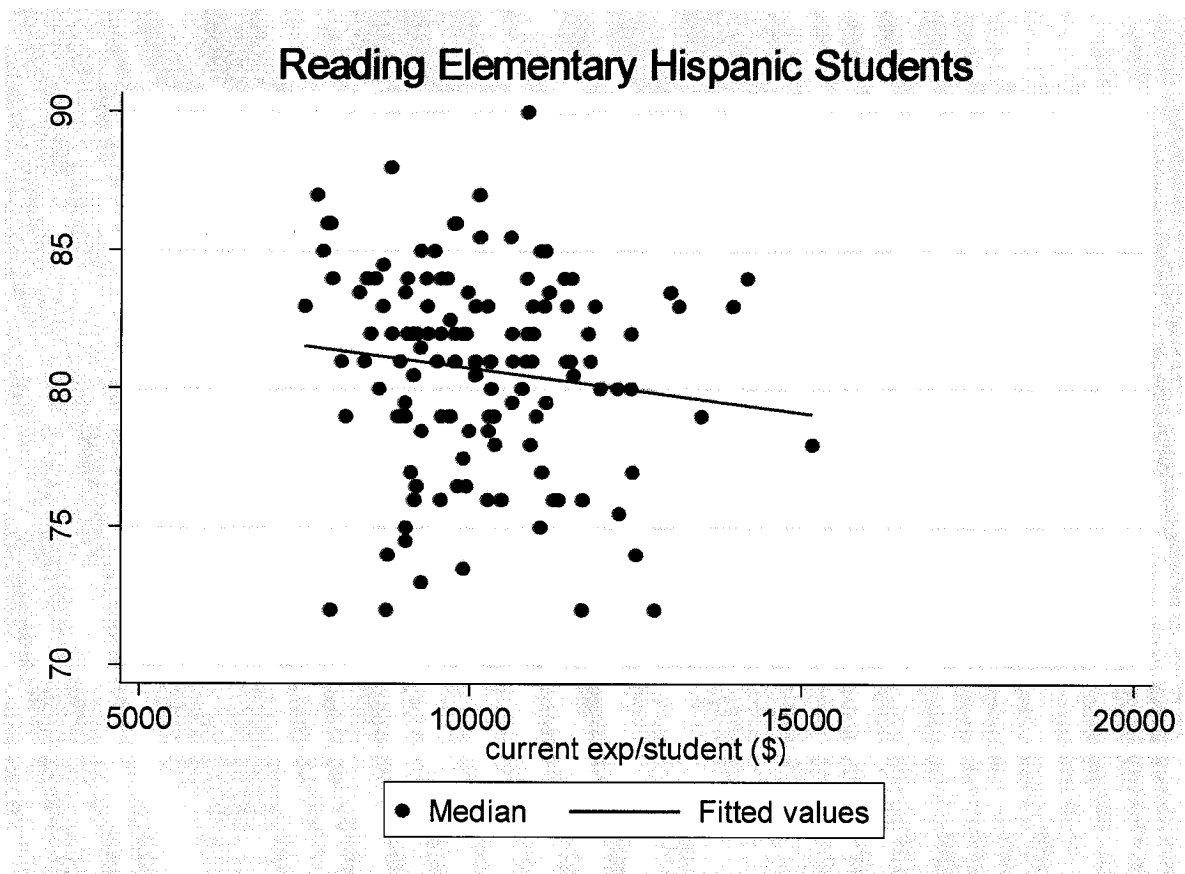
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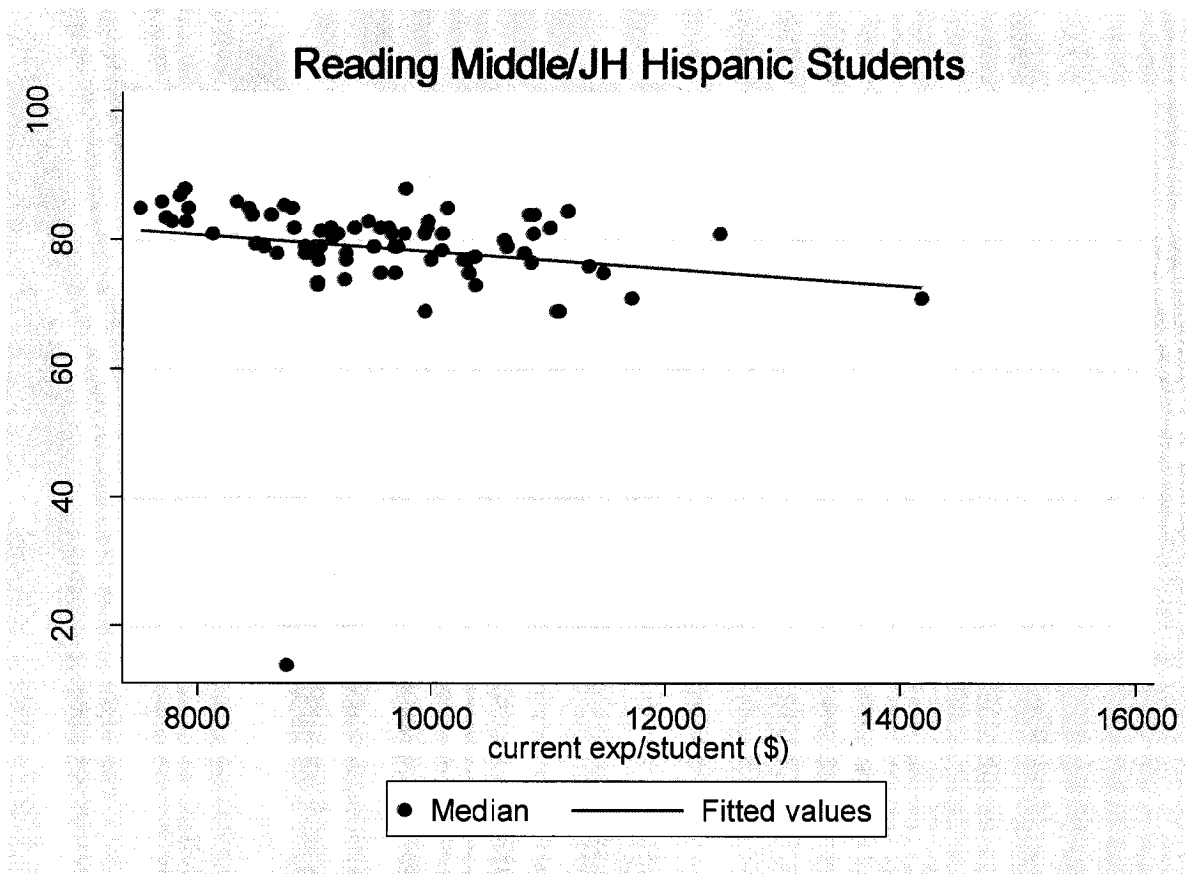
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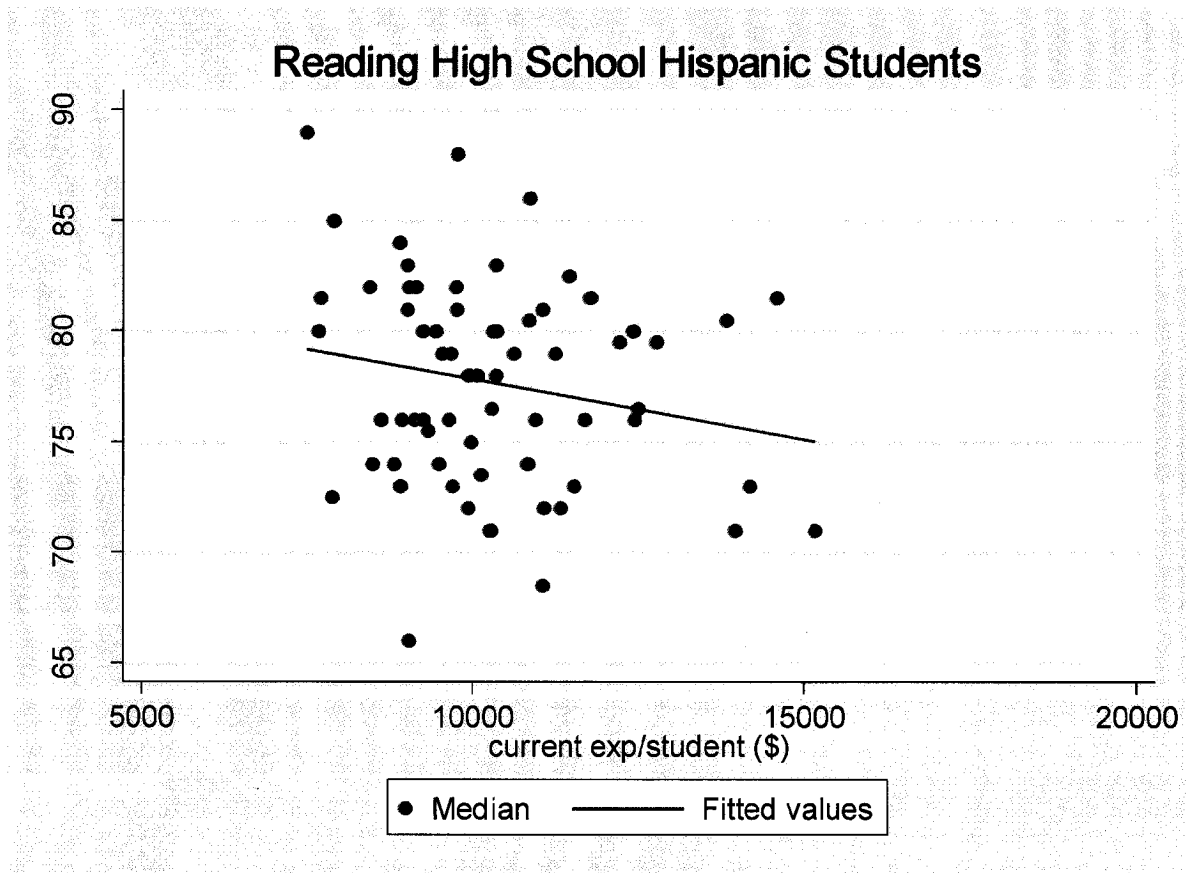


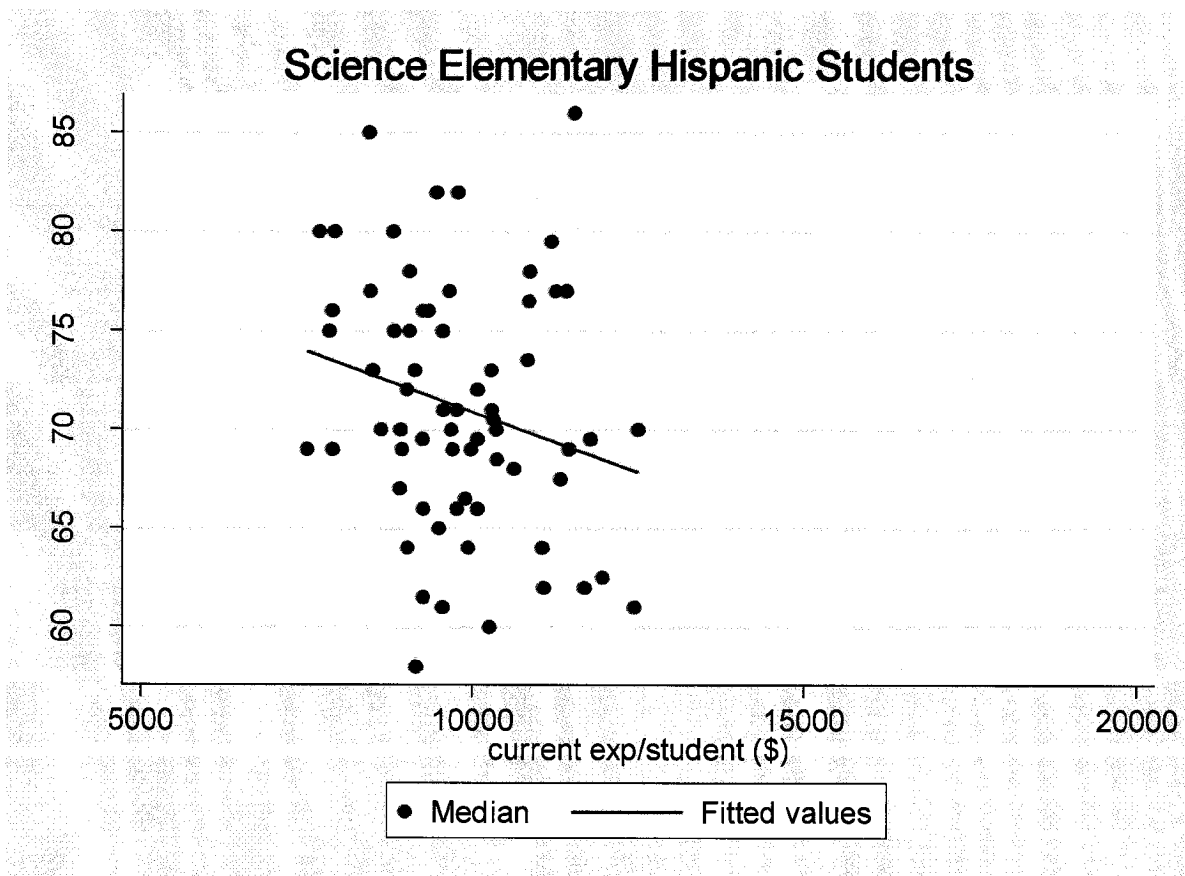


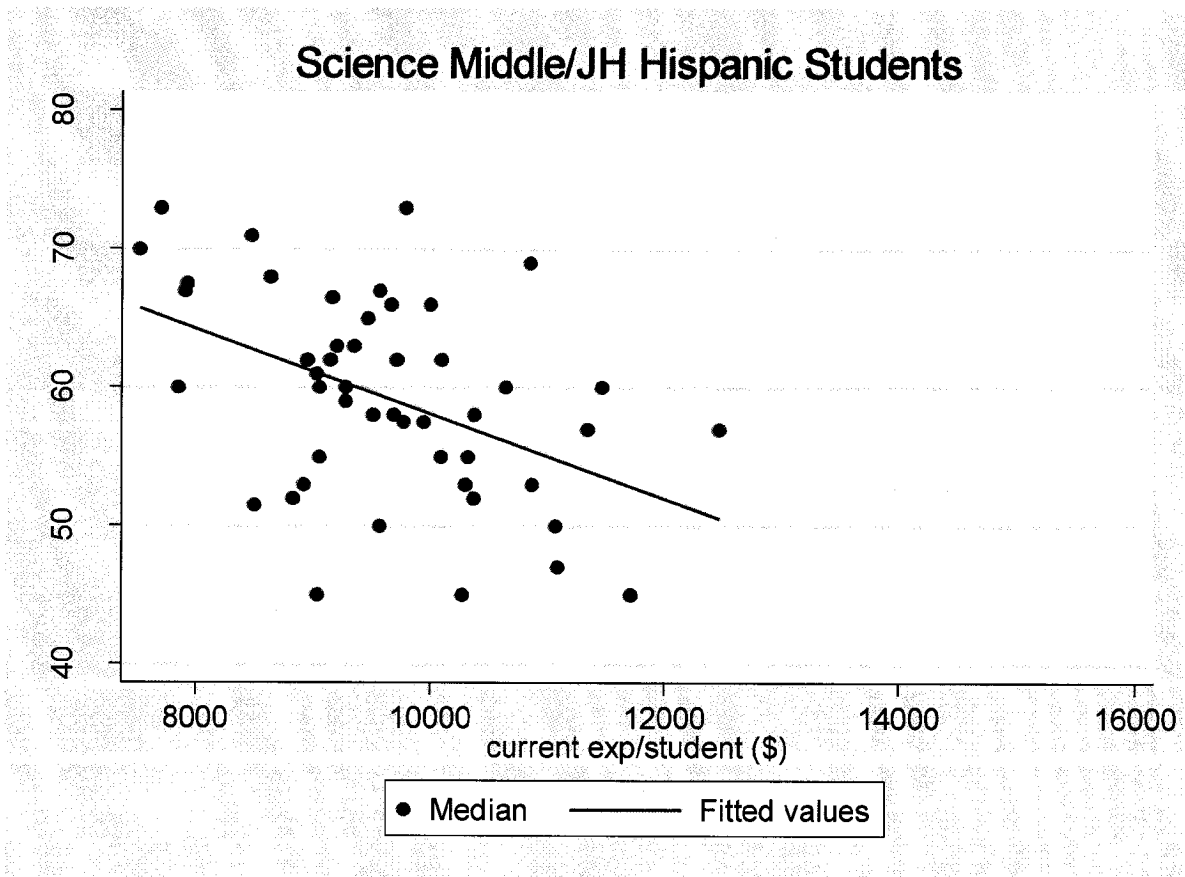


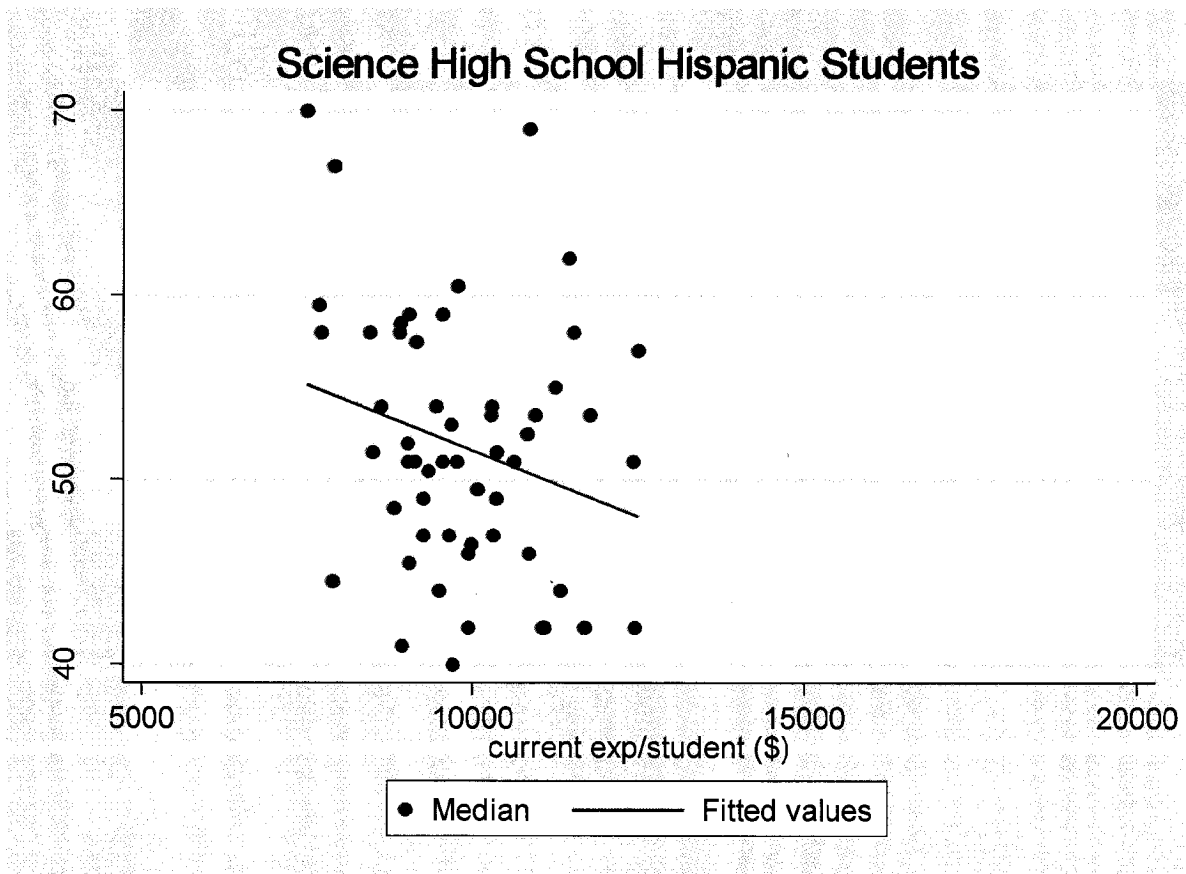








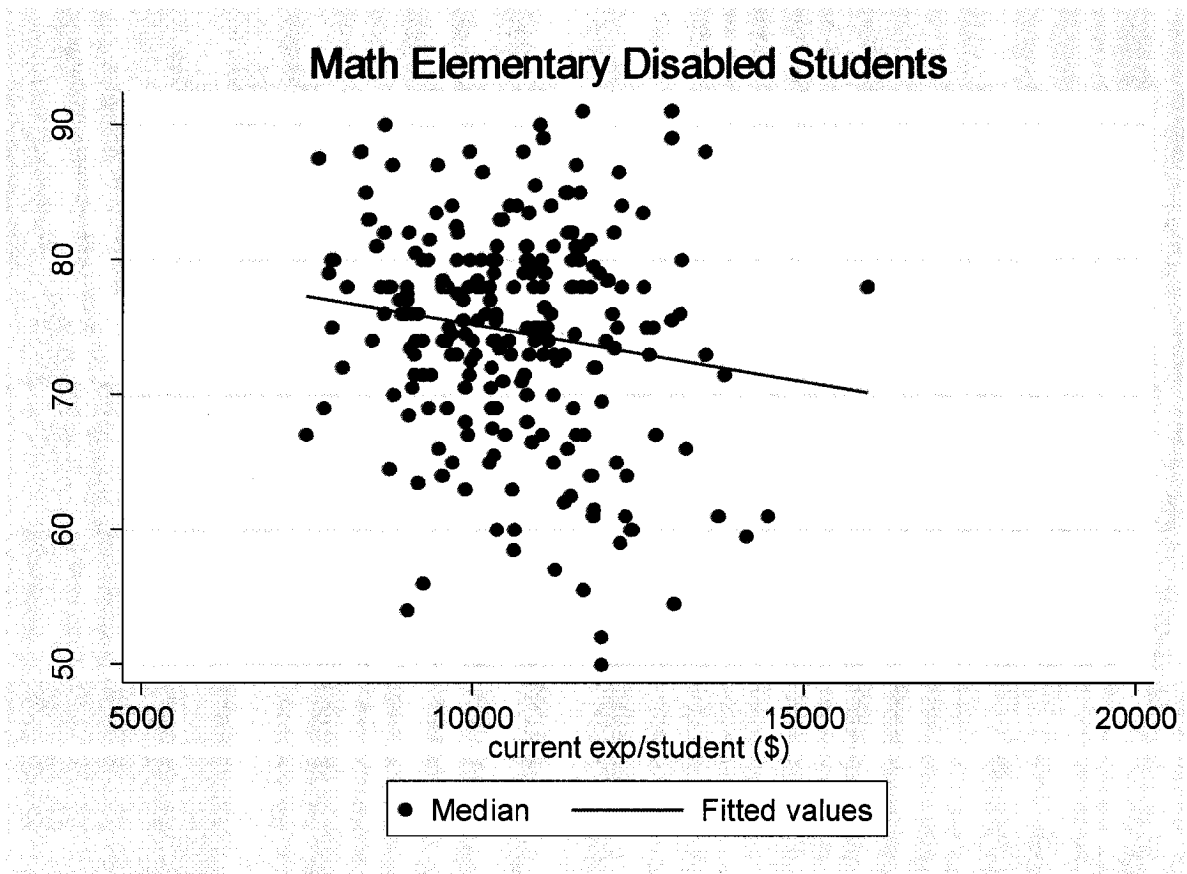


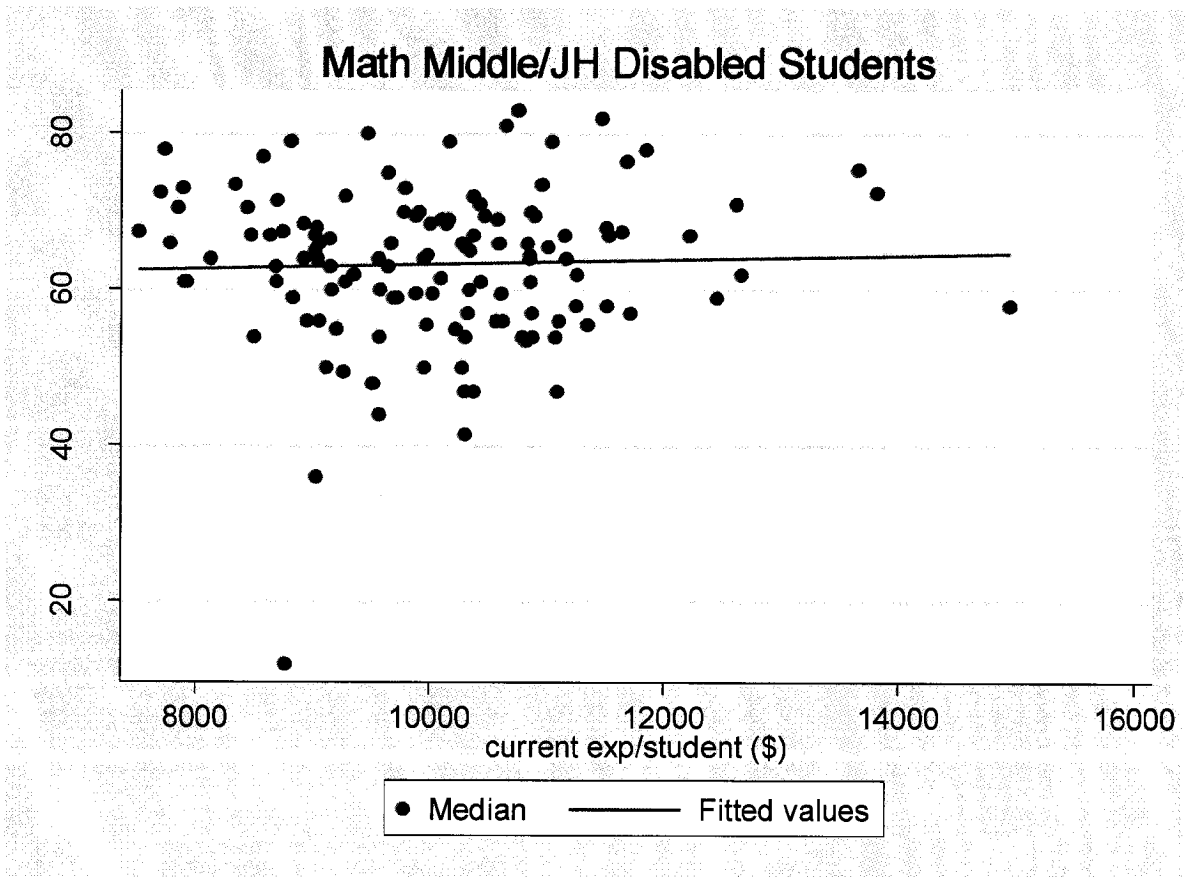


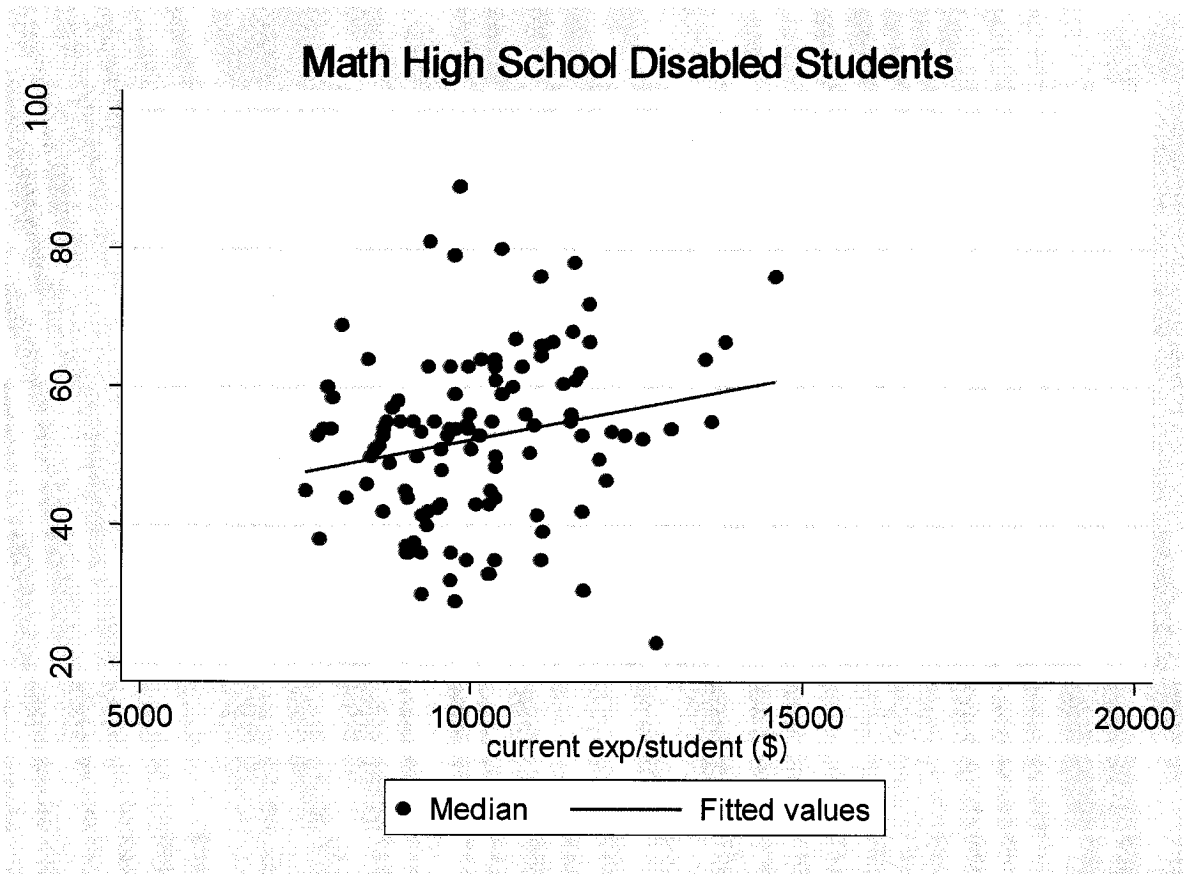
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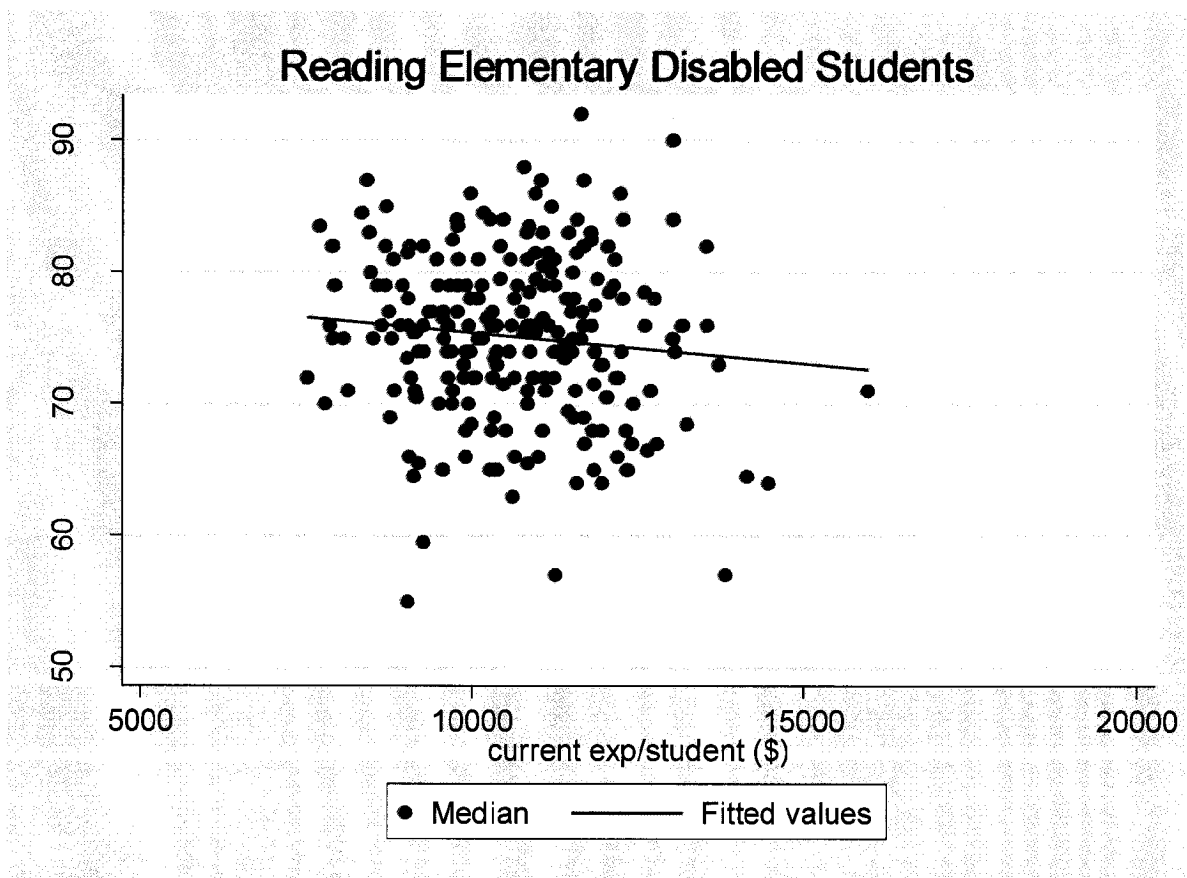
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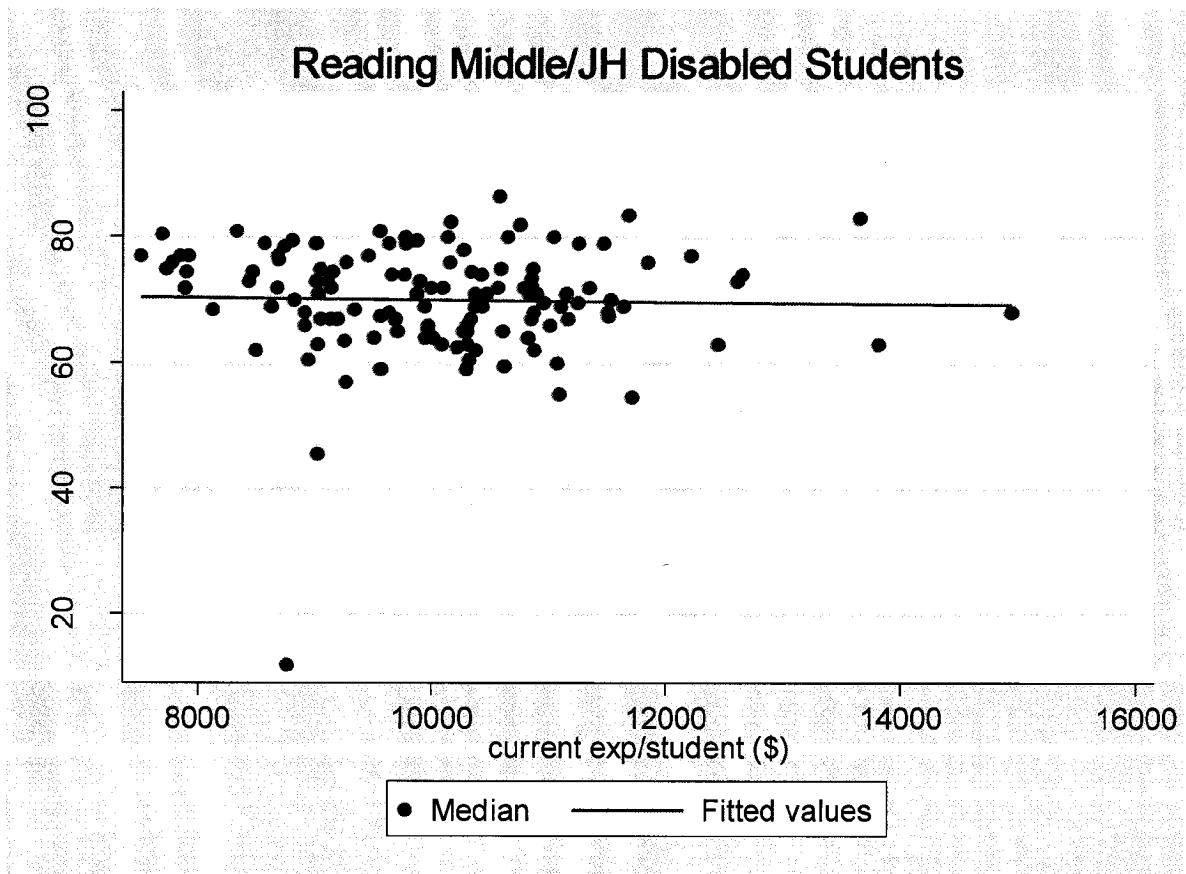
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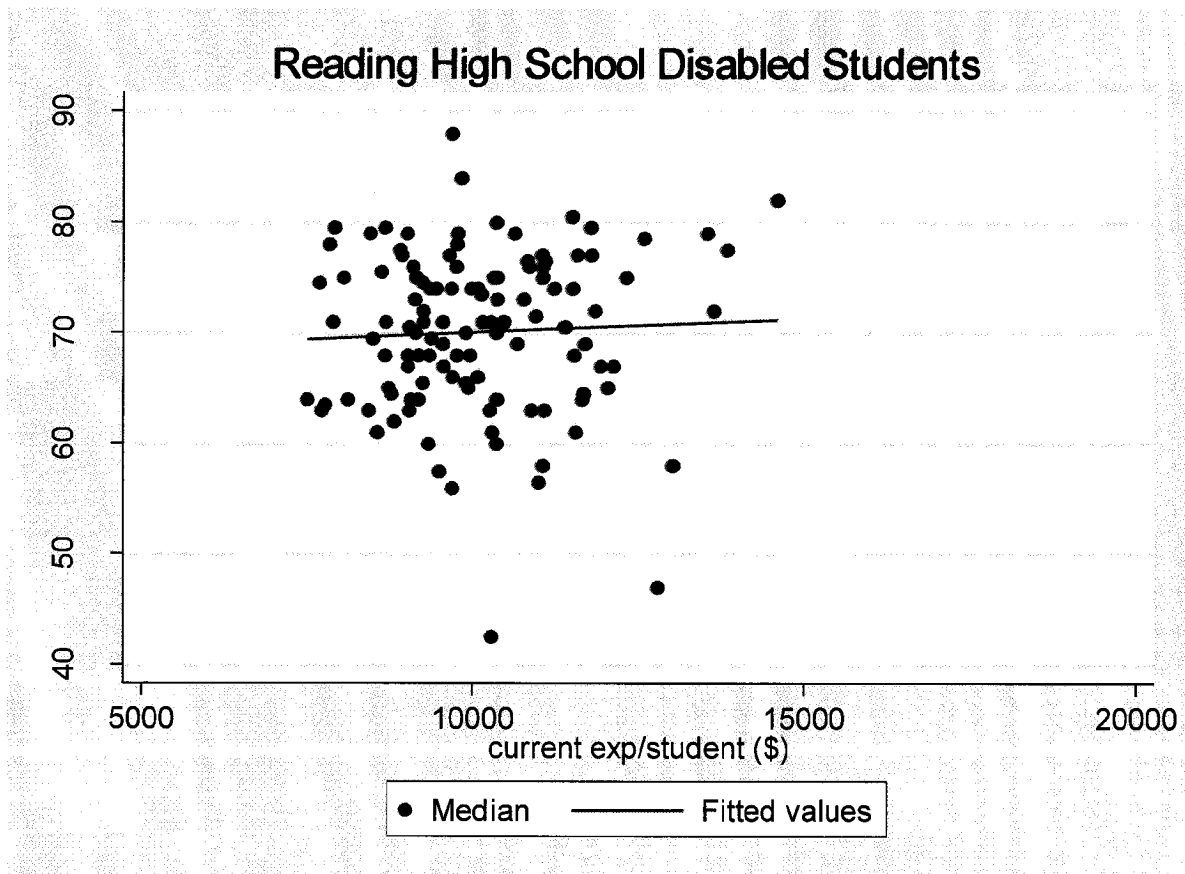


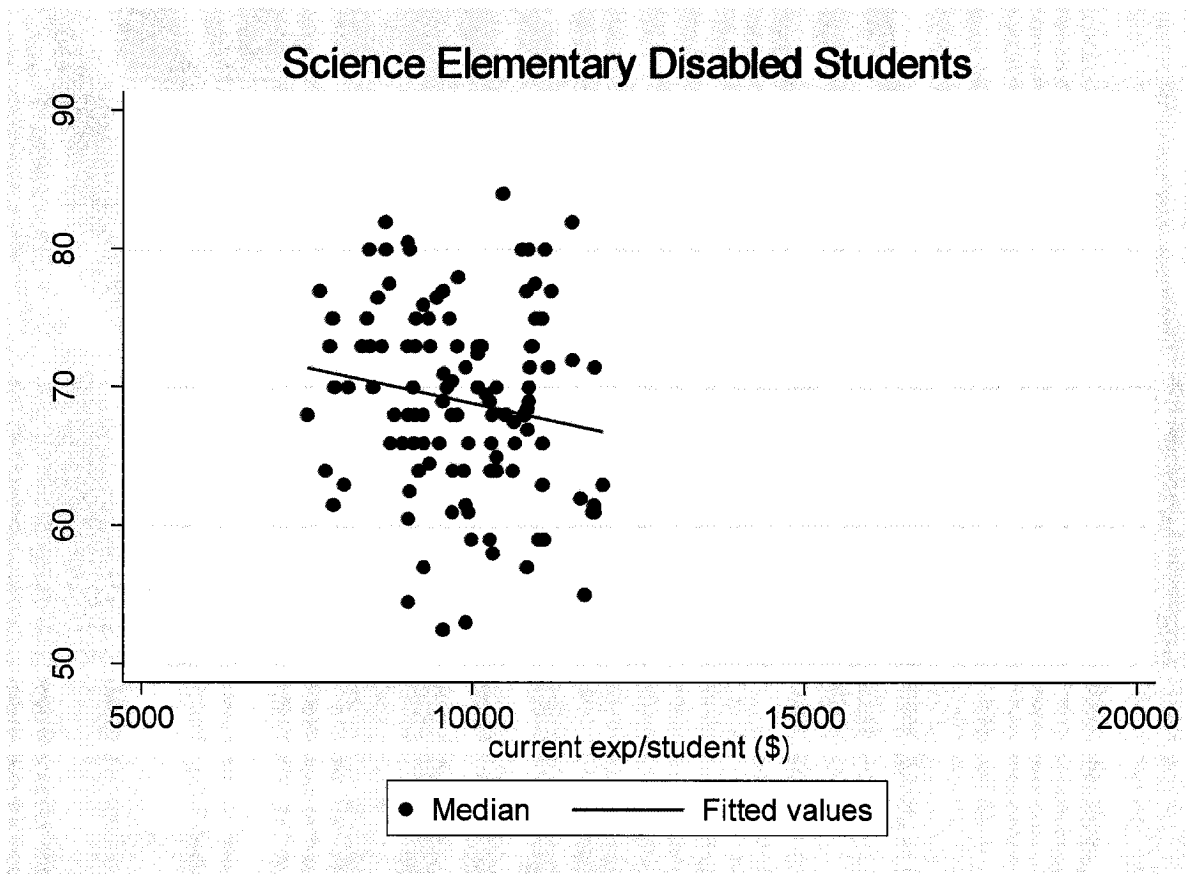


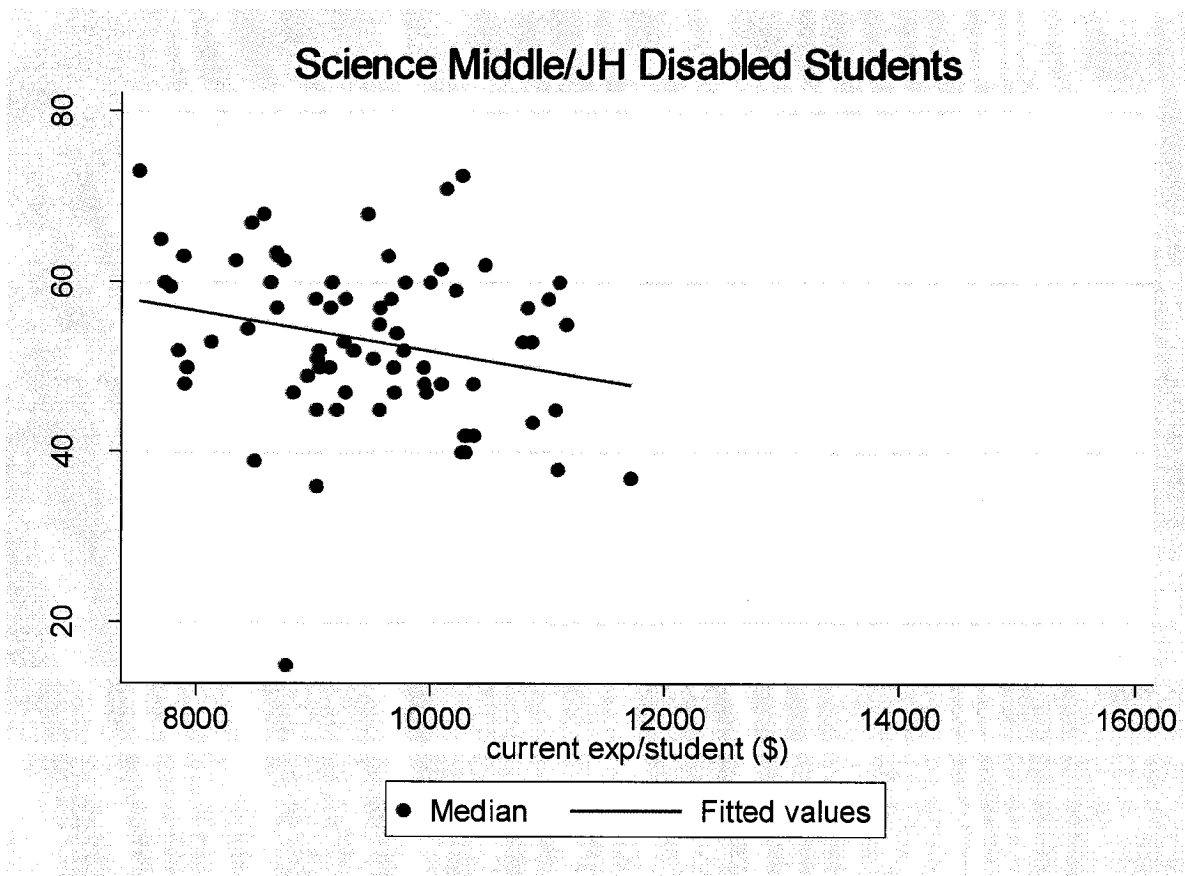


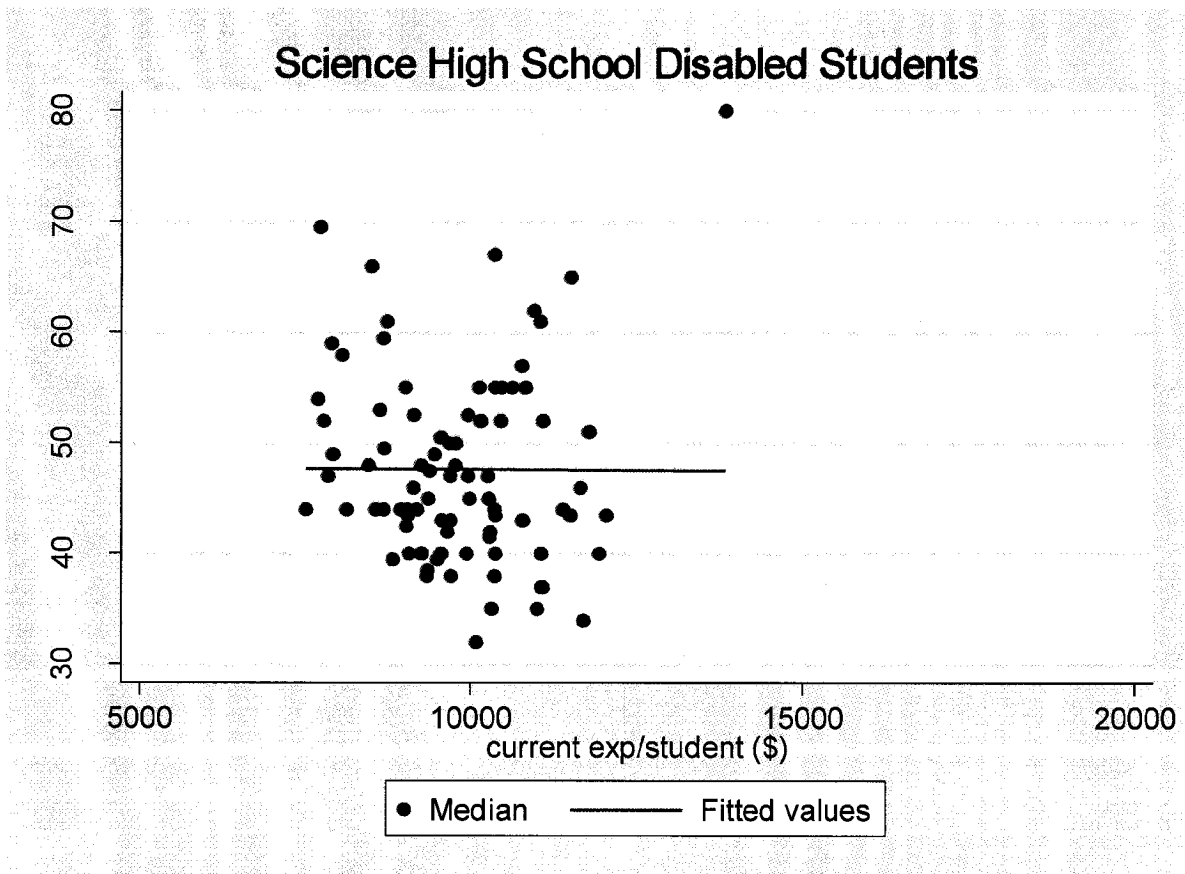








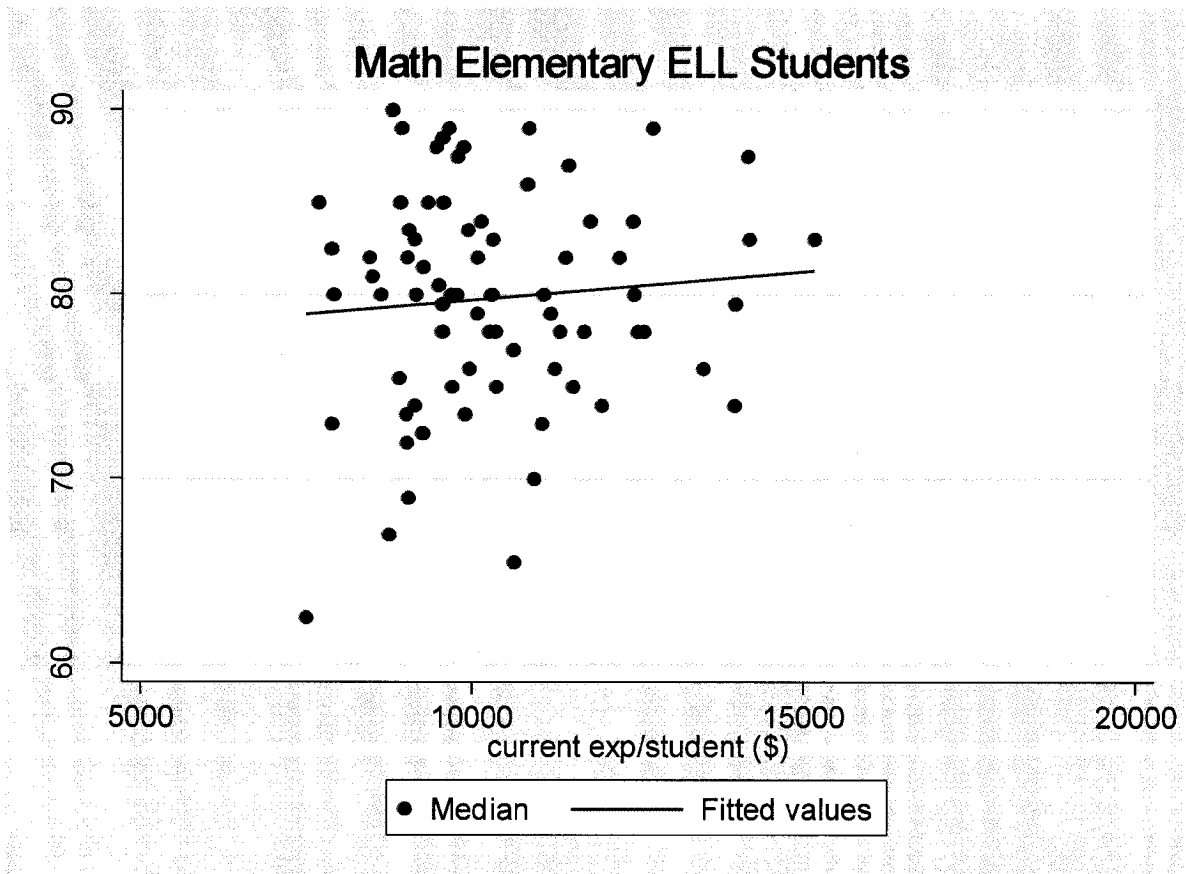


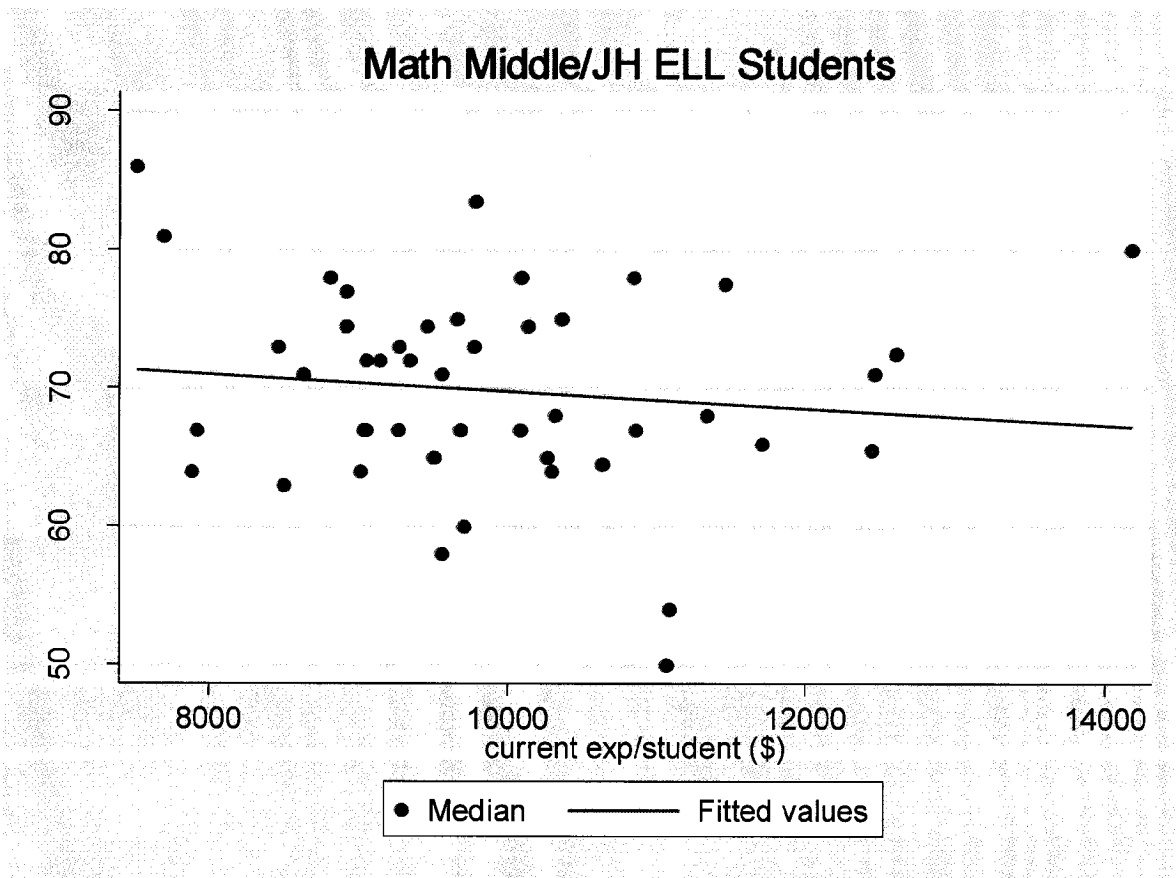


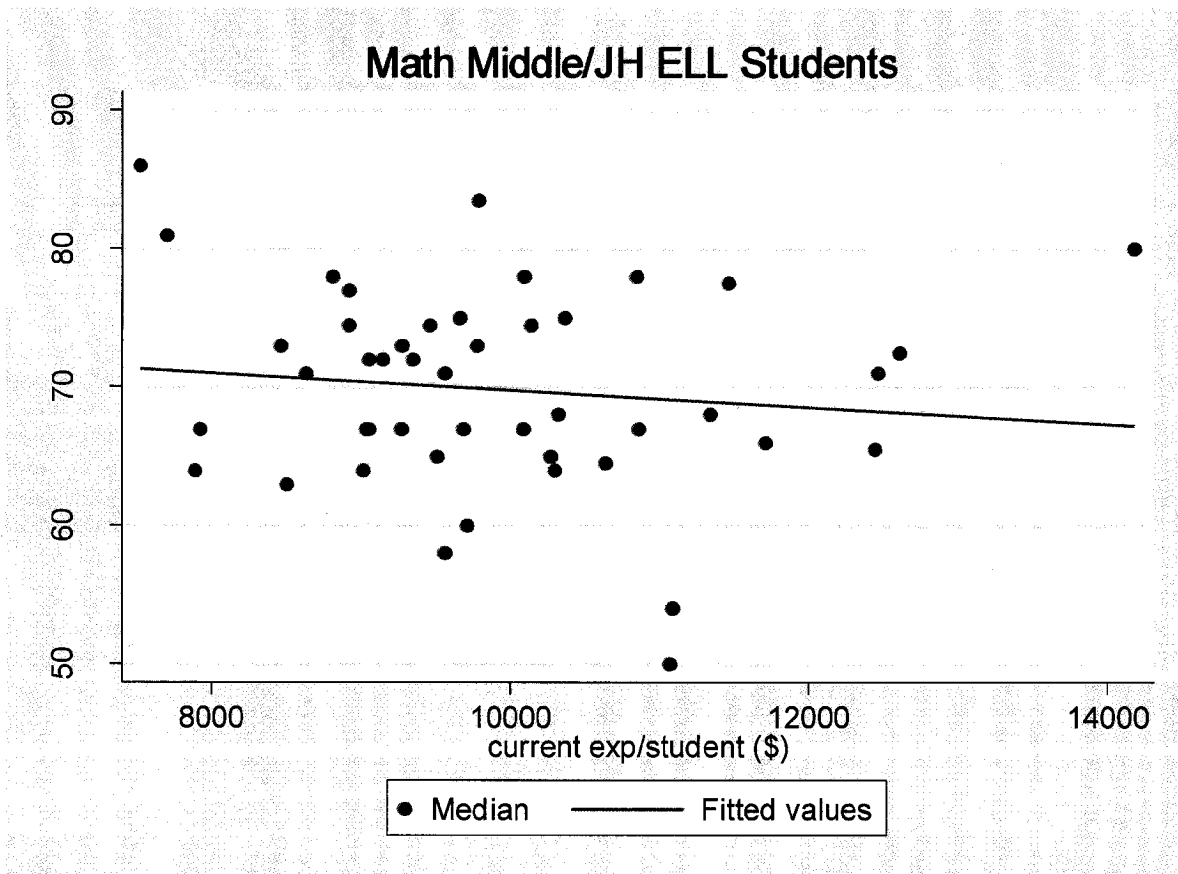
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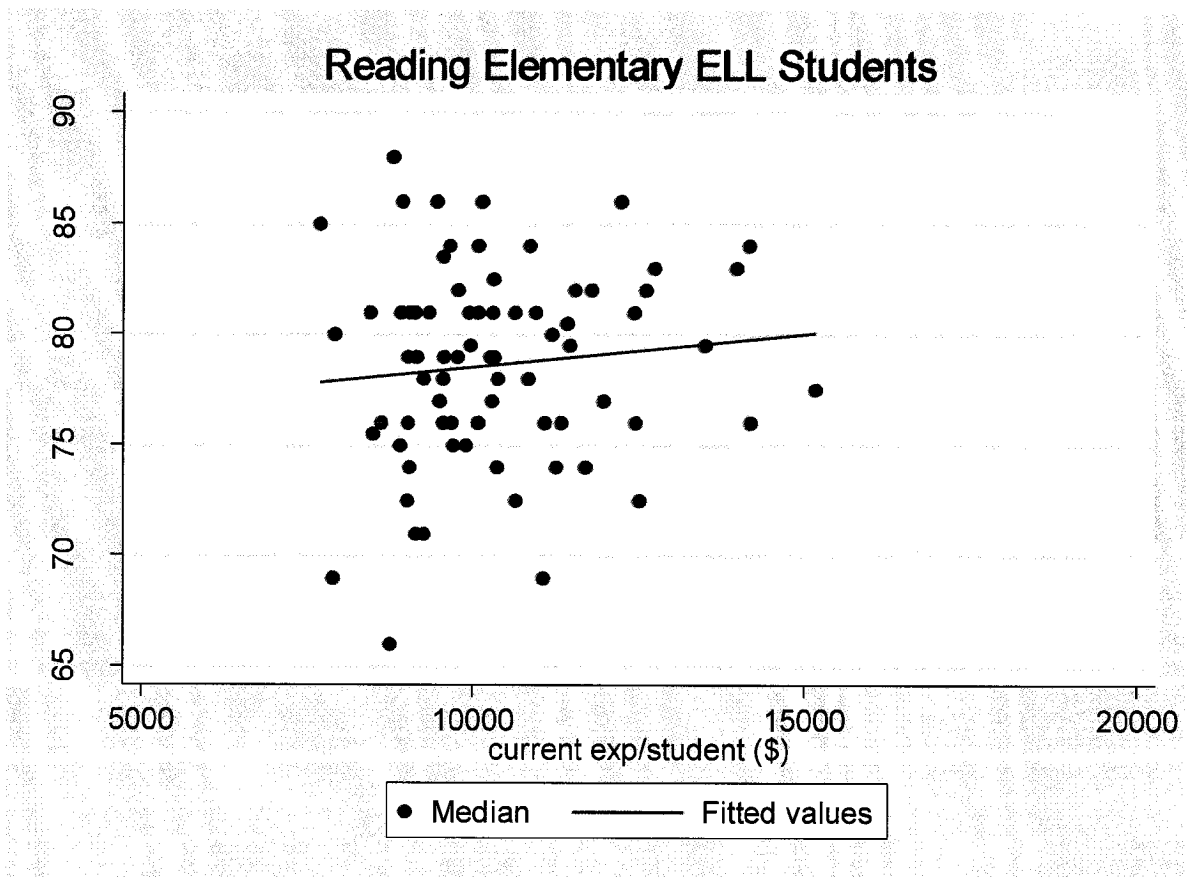
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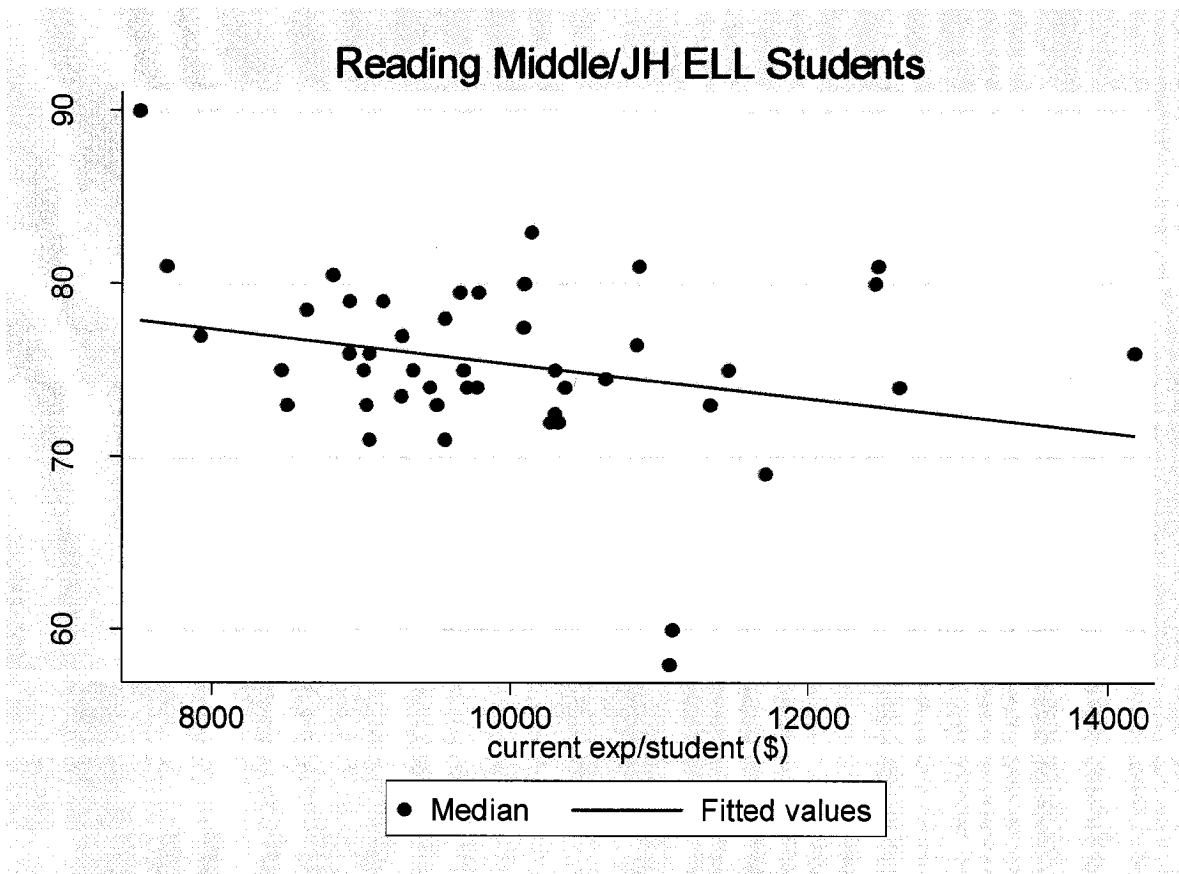
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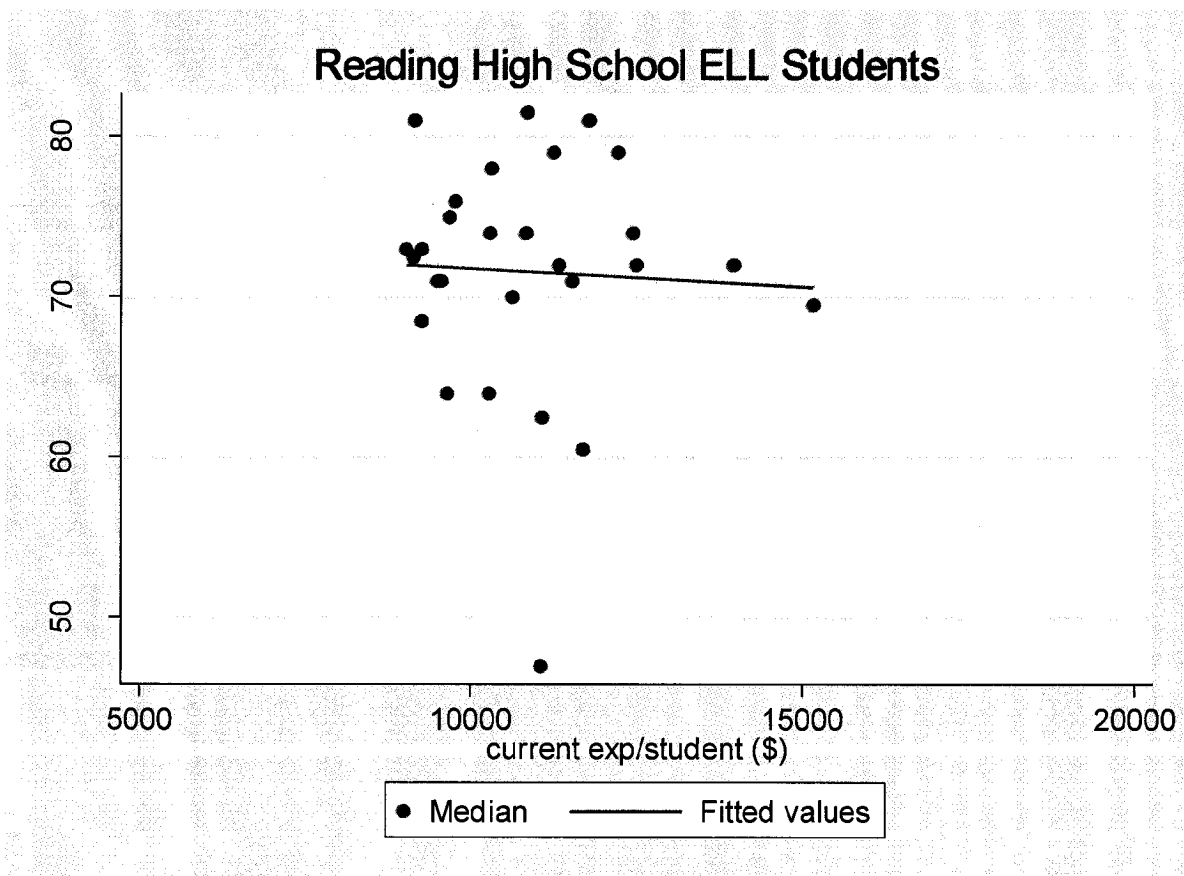


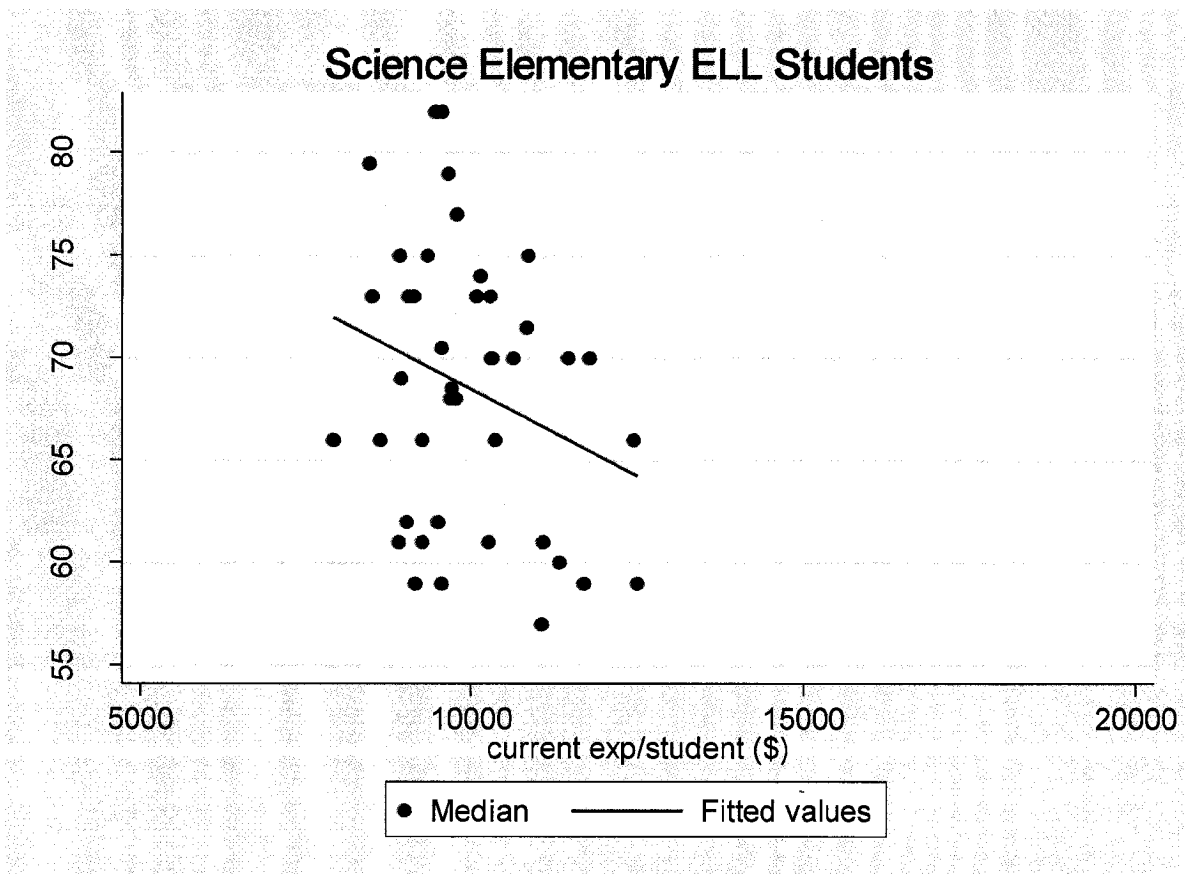


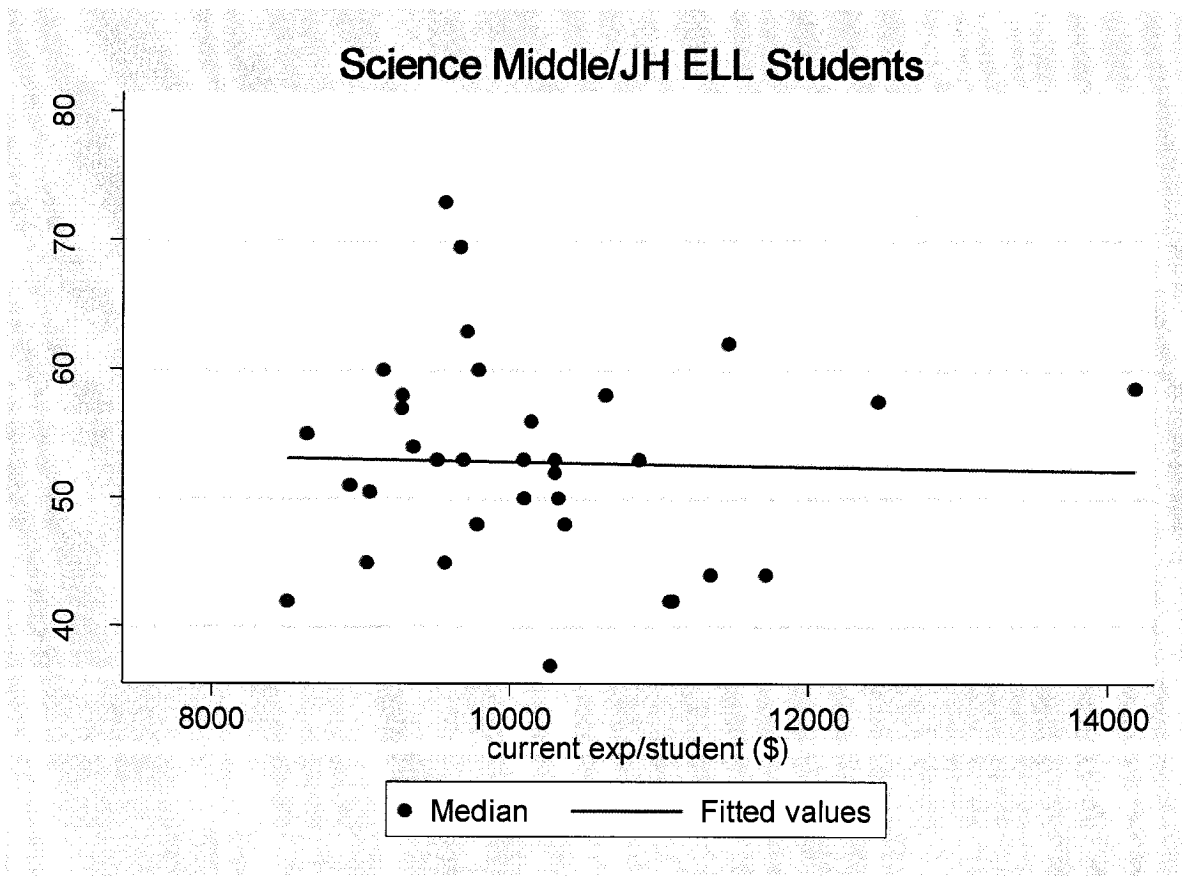


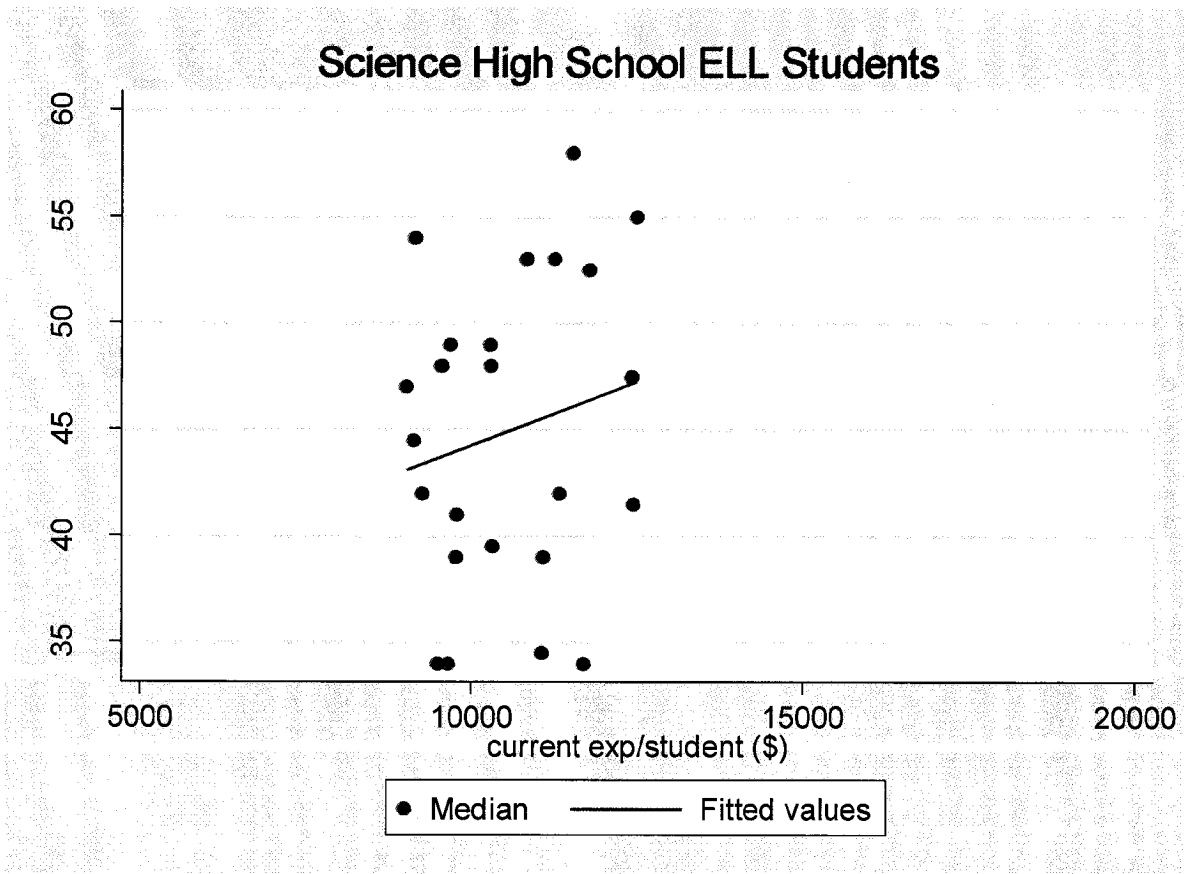












2/2012

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Degrees:

Ph.D., University of Wisconsin-Madison, 1980
M.A., University of Wisconsin-Madison, 1976
B.A., Cum Laude, University of Missouri-Columbia, 1974

PROFESSIONAL ASSOCIATIONS/AFFILIATIONS

American Economic Association
Association for Education Finance and Policy
Society of Labor Economists

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Co-Investigator, CALDER, Urban Institute, Washington DC
Co-Investigator, NCPI, Vanderbilt University
Affiliated Scholar, CESifo, Munich

EMPLOYMENT

Professor of Economics University of Missouri –Columbia Fall, 1995 – present

Scholar-in-residence. Ewing Marion Kauffman Foundation. Kansas City. Fall, 2005 – Fall, 2006

Middlebush Professor of Economics, Fall, 2002 – Fall, 2005

Economics Department Chair, University of Missouri - Columbia, Summer 1995 – Fall, 2005

Professor of Economics, Department of Economics, University of Massachusetts at Amherst, Fall, 1993 - Summer, 1995

Associate Professor of Economics, University of Massachusetts at Amherst, Fall, 1987 - Summer, 1993

Assistant Professor of Economics, University of Massachusetts at Amherst, Fall, 1980 - Summer, 1987.

Associate Director, Massachusetts Institute for Social and Economic Research, University of Massachusetts at Amherst, Summer 1992 - 1995.

Visiting Assistant Professor of Economics, Notre Dame University, Spring, 1986.

Cooperating Faculty, Labor Relations and Research Center University of Massachusetts, 1980 to 1995.

Lecturer, Department of Economics, Notre Dame University, 1979-80.

PUBLICATIONS

Books:

Dale Ballou and Michael Podgursky. Teacher Pay and Teacher Quality. Kalamazoo, MI: W.E. Upjohn Institute, 1997.

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"Occupational Classification Systems and Vocational Education Planning." Jefferson City: Missouri Occupational Training Information System, State Department of Education, 1975. (with Alan Roskam).

Referee/ Reviewer:

American Economic Review, Review of Economics and Statistics, Journal of Human Resources, Industrial and Labor Relations Review, Industrial Relations, Growth and Change, Applied Economics, Cambridge Journal of Economics, Small Business Economics, Contemporary Policy Issues, Eastern Economic Journal, Education Matters, Teachers College Record, Educational Researcher, Economics of Education Review, Journal of Policy Analysis and Management, Education Evaluation and Policy Analysis, Education Next, Education Finance and Policy

National Science Foundation, Smith-Richardson Foundation, Fordham Foundation, Spencer Foundation, Kauffman Foundation

Other Professional Service

Chair, Missouri Advisory Commission on Civil Rights, 2007- present
National Research Council, Panel on Teacher Preparation. 2005-2010
Editorial Board, Peabody Journal of Education, 2007-present
Editorial Board, Education Finance and Policy, 2004-present
Board of Directors, Missouri Show Me Institute. 2005-present
Advisory Board,. National Center for Teacher Quality. Washington, D.C. 2003-present.
Advisory Board. American Board for Certification of Teachers Excellence, Washington, D.C. 2001- present
Technical Board of Advisors, Department of Education Reform, University of Arkansas, 2005- present
NCES School Finance Technical Review Panel, 2004-07
IES expert review panel, 2004.
ERIC Advisory Board, 2004-2006

Selected Recent Funded Research

Joyce Foundation. Analysis of Teacher Retirement Benefit Systems in Illinois and Indiana. 2009-2011.

Smith Richardson Foundation. (with Robert Costrell), Labor Market Effects of Teacher Retirement Benefit Systems. 2008-2010.

Texas Education Agency. In cooperation with NCPI (Vanderbilt). Evaluation of Texas Performance Pay Programs. 2007-2011.

National Center for Education Statistics. Research Potential of State Administrative Data on Teacher Pay and Benefits. (2006-07).

Co-Investigator, National Center for Performance Incentives, Vanderbilt University, (IES research center, 2006-2011).

Co-Investigator, Center for Analysis of Longitudinal Data in Education Research (CALDER), Urban Institute (IES research center, 2007-2011).

Missouri Department of Higher Education. Analysis and Maintenance of Higher Education Database. FY2008.

Ewing Marion Kauffman Foundation. "The Market for Math and Science Teachers in the K.C. Metro Area."

Missouri Department of Higher Education/ Lumina Foundation. Affordability, Access and Performance of Missouri Public Higher Education Institutions. 2000-2004

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Fordham Foundation. Teacher Training and Licensing 1999-2000

National Science Foundation Instrumentation Grant 1999-2001

Missouri Department of Elementary and Secondary Education. Teacher Supply and Demand Study 1999-2000

W. E. Upjohn Institute for Employment Research. Teacher Compensation. 1994-1997

U.S. Department of Agriculture. Economic Research Service. Rural Teachers and Schools. 1995-96

U.S. Department of Education. National Center for Education Statistics. Teacher Quality and Turnover. 1994-95

Selected Consulting

State of Connecticut, School Finance reform.

Joyce Foundation. Teacher Pensions

South West Regional Education Laboratory. Teacher Retirement Benefits

Fordham Foundation. Teacher Pensions.

Sinquefeld Family Foundation. Education and Economic Policy.

Abell Foundation / Maryland Public Policy Institute. Teacher pensions

National Assessment Governing Board, Washington, D.C. Using NAEP to Measure Teacher Quality.

Kansas City Missouri School District. Analysis of trends in black-white student achievement gaps.

Missouri Department of Higher Education. Teacher quality. Education access.

Missouri Department of Elementary and Secondary Education. Teacher quality

California State Legislature and California Department of Education. School finance adequacy and teacher quality.

Texas State Legislature and Texas Education Agency. School finance adequacy and teacher quality.

New York State Legislature and Board of Regents. School finance adequacy and teacher quality

South Carolina Legislature. School finance adequacy and teacher quality.

Massachusetts Department of Education. School finance adequacy and teacher quality.

State of Wyoming/ Management Analysis and Planning. Wyoming school finance. Teacher pay adequacy.

CURRENT RESEARCH INTERESTS

Teacher Labor Markets, Teacher Compensation, Economics of Education

February 29, 2012

Mr. Arthur S. Chalmers
Hite, Fanning, & Honeyman, L.L.P.
100 N. Broadway, Suite 950
Wichita, KS 67202

Dear Mr. Chalmers:

Attached please find three documents that relate to my testimony in the case of *Gannon v. State of Kansas*:

1. Testimony concerning the potential economic consequences to Kansas and its citizens if state government taxes must be raised and/or state government spending cut to make an additional approximately \$1.2 billion available annually for K-12 public schools.
2. A report, authored by me and published by the Kansas Policy Institute, titled: "Profile and Comparison of Kansas K-12 Employment Levels."
3. An updated Table 2 from the above report.

I am obligated by my employer, the University of Kansas, to note that all opinions expressed in my testimony are my own and should in no way be interpreted as reflecting the views of the University of Kansas (or any subunit thereof) or the Kansas Board of Regents.

Sincerely,

A handwritten signature in black ink, appearing to read "A. Hall", with a large, stylized loop at the beginning.

Arthur P. Hall

Testimony concerning the potential economic consequences to Kansas and its citizens if state government taxes must be raised and/or state government spending cut to make an additional approximately \$1.2 billion available annually for K-12 public schools.

A large body of academic research investigates the interaction of fiscal policy on economic growth. That research has direct relevance for the trade-offs state policy makers must face in *Gannon v. State of Kansas*.

The following points set a general context for an evaluation of the relevant issues:

1. Several realistic scenarios indicate that Medicaid and proper funding of the Kansas Public Employees Retirement System will, absent record-breaking sustained economic growth, force state lawmakers to confront structural deficits in the General Fund budget over the fiscal years covering 2013 to 2023. Under the expected-case budget scenario if the new federal health care law (known as the Patient Protection and Affordable Care Act of 2010) becomes fully implemented, the structural budget deficits driven by Medicaid requirements could average up to \$500 million annually.¹
2. Economic growth is the engine that drives the prosperity of Kansas citizens and makes possible the resources the state government requires to finance public programs. The process of economic growth is a complex (and fickle) phenomenon in which small differences among economies can make a large difference over time. Economic growth operates like compound interest; small differences in the average economic growth rate can amount to substantial differences in the average incomes over time.

Kansas has had episodes of solid economic growth, but, over the past three decades, it has ranked 39th among the states, growing 0.58 percentage points below the national average annual economic growth rate.² To illustrate the economic importance of that seemingly small difference, the Kansas economy would be approximately \$23.5 billion larger if Kansas had grown at the national average annual growth rate. That sum amounts to \$13,125 per Kansas worker (although the faster growth rate, had it happened, may have increased the number of workers, and thereby lowered the per-worker figure).

Generally speaking, the process of economic growth has two interrelated moving parts: (a) the number of people engaged in productive economic activity and (b) the productivity of those people—that is, the amount of economic value created per person engaged in productive economic activity. Productivity, in turn, relies on the incentive for people to invest in Kansas; productivity is a risky trial-and-error process that takes place on the front lines of individual business enterprises.

Fiscal policy, especially tax policy, can materially impact the incentives associated with working or investing in Kansas. Kansas already faces competitive challenges with regard to retaining workers and attracting business investment. Since 1985, Kansas has experienced a

¹ Arthur P. Hall, "Major Structural Deficits Looming in Kansas," Kansas Policy Institute, December 2011.

² Calculations by Arthur P. Hall using data from the U.S. Bureau of Economic Analysis.

net outmigration of taxpayers in every year but 1992 and 1993. Since 1990, Kansas has ranked 30th among the states in terms of net business formation.³

Analytical Scenarios Related to *Gannon v. State of Kansas*

A regular finding in economic research is that there is a negative relationship between the overall financial size of the government sector (as a share of gross domestic product or income) and the rate of economic growth.⁴ The same general finding also applies to patterns of domestic migration in the United States: people tend to migrate away from jurisdictions with higher taxes and larger government sectors, all else equal—even if the larger measured size is represented by the relative overall level of income earned in the education sector.⁵ Higher levels of education are an important element of national economic growth. However, from a state perspective, higher levels of education also increase the propensity of people to migrate longer distances in search of superior economic opportunity.

Tax Increases

Projections of fiscal conditions require certain assumptions about economic growth rates. This exercise is intended to illustrate general magnitudes of economic change based on the State's need to raise \$1.2 billion through taxation. (For perspective, based on the State's consensus revenue estimates for the FY 2013 Kansas budget, the requirement to raise an additional \$1.2 billion would imply a 19 percent increase in State General Fund revenue.) The illustrations documented below are built around projections for fiscal year 2016 and after in order to contemplate the dollar magnitudes that lawmakers may confront; however, the same analytical approaches would apply to any future or historical time frame.

Table 1 reports various estimates of the higher tax rates needed to raise \$1.2 billion. The estimates rely on a computer model of the state government's tax system and the income levels projected for FY 2016. The estimates rely on the following assumptions:

- The Kansas economy (gross domestic product, or GDP) grows at a rate of 4.65 percent per year. That rate is intentionally not adjusted for inflation and represents the actual average annual economic growth rate from 1990 to 2010. If the economy grows at a rate of less than 4.65 percent per year, then the tax rates estimated in Table 1 will be too low to raise the required revenue. (The actual average annual growth rate for the Kansas economy from 2000 to 2010 was 4.02 percent.)
- The estimates assume that average historical patterns hold for (a) the growth in the number of taxpayers, (b) the growth of taxpayers' incomes relative to GDP, and (c) the growth of specific types of tax revenues relative to GDP.

³ Arthur P. Hall, Testimony before Governor Brownback's Council of Economic Advisors, September 13, 2011.

⁴ Robert J. Barro, *Determinants of Economic Growth: A Cross-Country Empirical Study* (Cambridge: MIT Press, 1997).

⁵ Arthur P. Hall, Scott Moody, and Wendy Warcholik, "The County-to-County Migration of Taxpayers and their Incomes," Technical Report 09-0360, March 2009, Center for Applied Economics, University of Kansas School of Business.

- The estimates are “static.” They assume that the people comprising the Kansas economy will exhibit absolutely no behavioral response when the State changes the tax rates as described in Table 1. (The economic implications of potential behavioral responses are estimated below.)

Table 1: Estimated Tax Rates Needed to Raise an Added \$1.2 billion in FY 2016 (Static)			
	Current Rates	Required Rates if Isolated to Particular Tax	Required Rates if Proportionately Split among Each Tax
Individual Income	3.50% 6.25% 6.45%	5.13% 9.16% 9.45%	3.92% 7.00% 7.23%
Corporate Income	7.01%	61.0%	7.37%
Retail Sales Tax	6.30%	9.60%	7.06%
Property Tax	2.00%	3.60%	2.24%

Assessing the Economic Growth Implications of Higher Taxes—Academic Research

There is a huge literature on the relationship between taxes and economic growth. Two recent pieces of academic research can speak to the potential implications for economic growth resulting from the tax increases described in Table 1. Both research efforts find that tax policy operates with a time lag.

1. Economist Robert Reed has spent many years dealing with the difficult estimation and data issues inherent to the evaluation of the influence taxes have on state-level economic growth. It is fair to characterize his research as representing the state of the art.⁶

Distilling Reed’s findings to their essence relevant for the current topic, he finds (after comparing all 48 contiguous states over a 30-year time frame and controlling for many important economic interactions) that, on average:

- A one percentage point increase in tax burden over a five year period is associated with an inflation-adjusted per capita income growth rate that declines by 0.63 percentage points during that five-year period.
- This results has a further implication because it increases the “initial” tax burden five years hence—and a state having an initial tax burden that is one percentage point higher than other states is estimated to have an inflation-adjusted per capita income growth rate that is 0.73 percentage points lower in the subsequent five year period.

⁶ W. Robert Reed, “The Robust Relationship between Taxes and U.S. State Income Growth,” *National Tax Journal*, Vol. 61, No. 1, March 2008, pp. 57-80; and “The Determinants of U.S. State Economic Growth: A Less Extreme Bounds Analysis,” *Economic Inquiry*, Vol. 47, No. 4, October 2009, pp. 685-700.

- It is important to note that, statistically, these negative implications represent a net impact: they take into account any (measurable) positive economic benefits that may have resulted from state government spending.
 - Application to Kansas: The presumed increase in state taxes of \$1.2 billion in FY 2016 will increase the tax burden by an estimated 0.4 percentage points. Using the assumed economic growth rate of 4.65 percent, the tax increase will decrease the projected economic growth rate to 4.40 percent. Assuming further that the relative tax increase for Kansas persists relative to other states, the economic growth rate could further drop to an estimated 4.11 percent. Based on a projected GDP level of \$159.6 billion for 2016, the change in tax burden would result in a loss of \$9.3 billion in potential GDP 10 years hence, or an average of almost \$1 billion annually.
2. Economists Joseph E. McPhail, Peter Orazem, and Rajesh Singh have investigated the impact of state taxes on state productivity growth.⁷ The hypothesis of their study “is that there are persistent differences in distortionary tax policies across states which have caused persistent differences in capital investment across states.” Because there are no hard data on state-by-state capital investment, the differences in labor productivity are used as a proxy for differences in investment levels, a key driver of economic growth. Productivity growth is the primary economic cause of per-worker income growth.

Table 2 summarizes the empirical findings. The Joint impact reported at the bottom of Table 2 indicates that distortionary taxes have reduced productivity levels across states by almost 20 percent over the three decades covered by the study.

<i>Tax Type</i>	Table 2: Every 1% increase in tax rate leads to an X decrease in labor productivity (or GDP per worker):		
	<i>0-Yr Time Lag</i>	<i>3-Yr Time Lag</i>	<i>5-Yr Time Lag</i>
Property	0.03%	0.07%	0.06%
Corporate Income	0.06	0.05	0.06
Sales + Excise	0.04	0.05	0.04
Personal Income	0.01	0.02	0.02
Capital Gains	0.01	0.01	0.01
Joint (All Above)	15.6%	19.5%	18.7%

Application to Kansas: Applying the 5-year time lag figures with the estimated proportional tax rate increases from Table 1 provides the estimated impact, as reported in Table 3. Using the assumed average annual economic growth rate of 4.65 percent and the actual average annual growth rate of Kansas workers (1990-2010) of 0.985 percent provides a projected

⁷ Joseph E. McPhail, Peter Orazem, and Rajesh Singh, “The Poverty of States: Do State Tax Policies Affect State Labor Productivity?” Iowa State University, Department of Economics, Working Paper No. 10010, May 2010.

measure of labor productivity (GDP per worker) of \$103,950. Applying the estimated loss of potential productivity based on the impact of the select tax rate increases described in Table 3 leads to an estimated loss of \$2,369 in GDP per worker. There is a near perfect statistical correlation between productivity growth and per-worker compensation, so, on average, the lower productivity levels will translate to lower per-worker compensation.⁸

The proportional tax increase was chosen for this exercise because it would cause the least distortion in the allocation of resources. As Table 1 shows, raising \$1.2 billion through tax rate increases on particular taxes results in much greater increases in tax rates. For example, if the State chose to raise the money solely from the sales tax, that would result in a 52 percent increase in the State's sales tax rate. Based on the reported productivity reduction reported in Table 3, it would lead to an estimated loss of \$3,243 in GDP per worker.

<i>Table 3: Estimated Decrease in GDP per Worker from Proportional Tax Rate Increase on Select Taxes</i>				
<i>Tax Type</i>	<i>5-Yr Time Lag from Table 2</i>	<i>Proportional Tax Rate Increases of 12% from Table 1</i>	<i>Estimated Decrease in Potential Productivity 5 Years Hence (2021)</i>	<i>Estimated Decrease in Potential GDP per Worker (2021)</i>
Property	0.06%	12%	0.72%	\$748
Corporate Income	0.06	12	0.72	748
Sales + Excise	0.04	12	0.48	499
Personal Income	0.02	12	0.24	249
Capital Gains	0.01	12	0.12	125
Joint (All Above)	18.70%	n/a	n/a	\$2,369

Assessing the Economic Growth Implications of Higher Taxes—Economic Modeling

Economists often use dynamic computable general equilibrium models to evaluate the impact of taxes on economic activity. Computable general equilibrium models (CGE) are simulation tools not forecasting tools. They are tools that allow for building intuition about how the complex interrelationships of an economic system will respond to a change to the system. A dynamic CGE model assumes a steady-state growth path for the economy (a baseline). Absent from any “shocks,” the economy is assumed to remain on this path. If the economy experiences a shock, such as a tax change, the economy will diverge from this steady-state path and eventually turn onto a new path. The size and length of the divergence will depend on the size of the shock to the economy.

The primary adjustment mechanism in the CGE relates to a change in relative prices. A key postulate in economics is that economies will tend to rebalance to a new set of equilibrium (steady-state) conditions based on a change in prices. Taxes, in effect, change the relative price of investment, production, work, and consumption, depending on the type of tax under analytical consideration. A tax increase increases

⁸ Arthur P. Hall, “Economic Growth and Productivity in the Regions of Kansas, 1969-2003,” *Kansas Policy Review*, Vol. 28, No. 1, 2006, pp. 12-20.

relative prices. A tax decrease decreases relative prices. Consumers, workers, employers, and investors respond to these changes in relative prices.

Table 4 reports the results of running a computable general equilibrium model on the tax rate changes estimated in Table 1.⁹ The baseline assumptions are: (1) the Kansas economy will grow at an average annual rate of 4.65 percent and (2) the tax rate changes will increase tax revenue by \$1.2 billion.

Table 4: Dynamic Simulation of Tax Rate Increases					
	<i>Individual Income Tax</i>	<i>Corporate Income Tax</i>	<i>Retail Sales Tax</i>	<i>Property Tax</i>	<i>Proportional Split among Each Tax</i>
Required tax rate increase if isolated to particular tax	47%	870%	52%	80%	12%
Projected economic growth rate	4.41%	3.72%	4.46%	4.59%	4.54%
Implied level of lost annual GDP 10 Years Hence (billions)	\$12.9	\$21.4	\$4.5	\$1.4	\$2.6
Projected tax revenue compared to \$1.2 billion target (billions)	\$0.81	-\$0.058	\$0.89	\$1.1	\$1.01

Table 4 reports that each of the tax increase scenarios has a negative economic impact on the Kansas economy—and, by extension, a negative impact on the potential ability of the state government to raise the target level of tax revenue. The simulation results indicate that, with the exception of the property tax, isolating the tax increase on any particular tax instrument results in a greater negative impact than proportionately splitting the increase over each tax instrument. The higher any particular tax rate becomes, the more it puts an economic burden on specific types of economic activity.

Spending Cuts

A change in tax policy lends itself more readily to economic analysis than changes in spending policy. Taxes influence the prices that guide action; government spending realigns the use of resources. The net economic impact of resource realignment is difficult to quantify. Without a deep understanding of the details involved, economists can only generalize by saying that the process of resource realignment takes time and inevitably requires a suspension of existing economic activity in order to establish new types of economic activity. The dislocation may produce short term economic costs, but may (or may not) more than make up for those costs with future economic benefits.

The Kansas Legislature could reduce state government spending in myriad ways. Table 5, using the FY 2012 State General Fund Budget, contemplate one possible way, for the sake of illustrating a spending reduction combination that save \$1.2 billion for reallocation to K-12

⁹ The model used for the simulation was developed by Fiscal Associates, Inc. of Arlington, Virginia. Fiscal Associates has been involved for decades in the so-called “dynamic scoring” debate at the federal level.

education. For the State General Fund Budget items listed, the Kansas Legislature could implement an across-the-board reduction in spending of 38.2 percent to save \$1.2 billion. (In all likelihood, the estimated percentage amount would be smaller with the actual budget available in future years. More budget items could be included, which would reduce the required percentage amount per line item.)

Table 5: Hypothetical Spending Reductions to Save \$1.2 Billion from FY 2012 SGF Budget

<i>State General Fund Budget Item</i>	<i>FY 2012 Approved Budget (\$Millions)</i>	<i>Budget Reduction (\$Millions)</i>	<i>Adjusted Budget (\$Millions)</i>
Dept. of Revenue	16.0	9.9	6.1
Dept. of Commerce	15.0	9.2	5.7
Judiciary	101.9	63.0	39.0
Social & Rehabilitation Services	722.2	446.2	276.0
Regents	738.1	456.1	282.0
Corrections	260.2	160.8	99.4
Juvenile Justice	72.5	44.8	27.7
Transportation	16.2	10.0	6.2
Total	\$1,942.1	\$1,200	\$742.1

Source: Kansas Division of the Budget, FY 2012 Comparison Report, Schedule 2.2

Profile and Comparison of Kansas K-12 Employment Levels

Executive Summary

As taxpayers and legislators seek policy solutions that effectively utilize available resources and keep spending and taxes at levels that promote growth in the private sector economy, it's essential to have a clear understanding of related facts and trends. K-12 spending consumes roughly 53% of general fund spending in Kansas and personnel accounts for the vast majority of most districts' total costs, so this analysis of public school employment is intended to help frame those policy discussions.

Whether based on U.S. Census data, Department of Education data from the National Center of Education Statistics (NCES) or from the Kansas Department of Education (KSDE), K-12 employment in Kansas' schools exhibit several noteworthy trends.

For several decades, Kansas has had among the highest and fastest growing public school employment-to-student ratios compared to the nation and the region.

- Kansas has the 8th highest employee-to-student ratio in the country according to the most recent national statistics for the school year that began in 2007, with 16.15 employees for every 100 students.¹
- In 1972, Kansas was 7% above the employee-to-student national average but by 2007 Kansas was 19% above the national average.

At least as evidenced by employment patterns, Kansas schools have often placed greater emphasis on non-teaching positions than on teachers.

- 2010 employment levels are slightly below peak levels reached in 2008 but there are still 4.9% more teachers currently employed than in 2000, whereas all other employment is 7.8% higher. Student enrollment increased 1.9% over the same period.
- Kansas exceeds the national averages of teachers-to-student and non-teacher instructional employees-to-student ratios by 17% and 18%, respectively, but is 23% above the national average for all other employees.

These above-average employment-to-student ratios cost Kansas taxpayers several hundred million dollars.

- Based on the overall average pay and benefits as reported by U.S. Census, the 2007 cost of additional employees above the national average was \$530.3 million.

¹ Throughout this analysis, 'year' refers to the start of the school year; e.g., 2007 refers to the year beginning in the Fall of 2007 and concluding in the Spring of 2008. This labeling method is used for consistency with U.S. Census and U.S. Department of Education / NCES data. Also, unless otherwise noted, 'students' refers to student headcount data.



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Kansas Compared to Other States

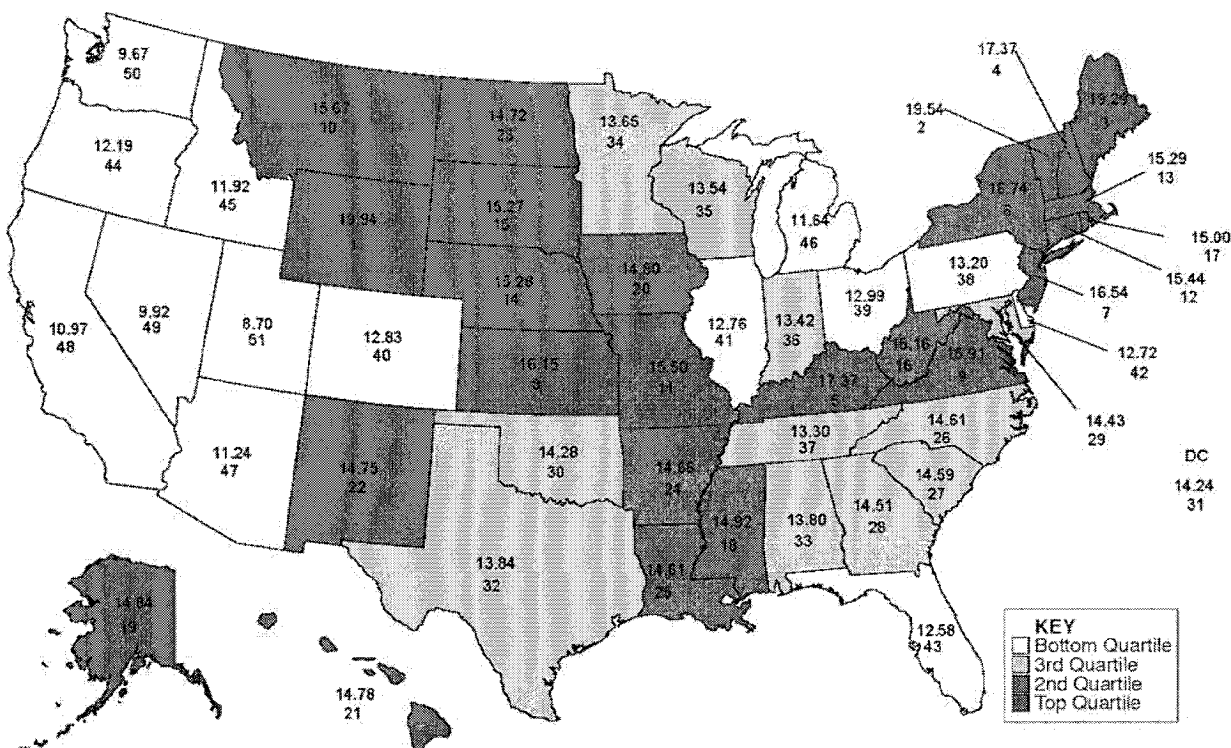
The perennial public school funding debates in Kansas can benefit from some historical perspective. For several decades, Kansas has had among the highest and fastest growing public school employment-to-student ratios when compared to the nation and the region. The growth of non-teacher personnel—not teachers—has driven this historical pattern.

Map 1 shows that Kansas ranked as the eighth highest state in terms of public school employees per student in 2007 (the latest year of most complete national data). That ranking carried an estimated price tag of \$530 million when compared to the 2007 average level among all the states (see Table 1).

Table 1 provides a high-level breakdown and comparison of Kansas public school employment levels per 100 students. (Throughout the report, employment levels refer to the number of full-time-equivalent employees, or FTEs. Data definitions appear in the Appendix.) The data in Table 1 (which relies on the U.S. Census Bureau's once-every-five-years Census of Governments) indicate that Kansas has FTE levels almost 20 percent higher than the national average and about 10 percent higher than the regional averages (which Map 1 helps delineate). The 2007 data show FTEs per 100 students about 55 percent higher than Kansas had in 1977.

The cost calculations in Table 1 rely on the full payroll cost (cash plus benefits) shown for each FTE component; the dollar figures are listed at the

Map 1: Total K-12 Full-Time-Equivalent Employees per 100 Students (and State Rank), 2007



Note: The top number in each state represents the number of full-time-equivalent employees per 100 students. The bottom number represents the state's rank. The color-coding illustrates the ranks by quartile, with red representing the highest-ranking quartile.

Source: U.S. Census Bureau; National Center for Education Statistics; Center for Applied Economics, KU School of Business

Table 1: Public School Employment Levels and Estimated Costs of the Kansas Differences

	Public School FTEs per 100 Students			Estimated Dollar Cost of Kansas Difference (Millions)		
	Total	Instruction*	Other	Total	Instruction*	Other
Kansas 2007	16.1	11.0	5.1	n/a	n/a	n/a
United States	13.6	9.4	4.2	\$530.3	\$382.9	\$135.8
Plains States	15.0	10.4	4.6	244.2	153.1	76.8
KS + Contiguous	14.6	9.9	4.7	309.0	256.0	58.9
Kansas 1997	14.3	10.1	4.2	375.0	223.7	125.0
Kansas 1987	12.8	8.9	3.9	686.5	488.2	180.4
Kansas 1977	10.5	7.4	3.1	1,156.4	844.0	290.7
Addendum						
2007 KS Avg. Pay	\$35,288	\$40,195	\$24,688			
2007 Pay + Benefits	\$43,757	\$49,842	\$30,613			

Note: Cost components do not add to total because of differences in estimated average payroll.

Plains States: Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota.

KS + Contiguous: Colorado, Kansas, Missouri, Nebraska, Oklahoma.

* Includes teachers and non-teachers. See Appendix for definitions.

Source: U.S. Census Bureau; National Center for Education Statistics; Center for Applied Economics, KU School of Business

bottom of the table. For example, the \$530.3 figure calculated as the cost difference between the FTE levels of the United States and Kansas resulted from the following procedure: $(16.1 - 13.6) \times \$43,757 \times (\text{Enrollment} \div 100)$. The dollars are in millions. According to the National Center for Education Statistics, Kansas had a 2007 student enrollment of 468,295.

To get a better picture of annual trends, Table 2 shows FTE data from the Kansas Department of Education. Like the data from the U.S. Census Bureau, Table 2 shows a significant increase in Kansas public school FTEs between 2002 and 2007. While employment levels declined somewhat over the last two years, employment has still grown considerably faster than student enrollment over the last ten years.

Table 2: Comparative Trends of Kansas FTE Employment and Enrollment

Year	FTE Employees			FTE Students	Cumulative Change Since 2000			
	Teachers	All Other	Total		Teachers	Other Employees	Total Employees	FTE Students
2000	32,742	31,409	64,150	446,970				
2001	33,084	32,071	65,155	445,377	1.0%	2.1%	1.6%	-0.4%
2002	32,658	31,334	63,992	444,541	-0.3%	-0.2%	-0.2%	-0.5%
2003	32,609	31,322	63,931	443,302	-0.4%	-0.3%	-0.3%	-0.8%
2004	32,825	31,182	64,007	441,686	0.3%	-0.7%	-0.2%	-1.2%
2005	33,479	31,915	65,394	442,556	2.3%	1.6%	1.9%	-1.0%
2006	34,351	33,628	67,979	444,879	4.9%	7.1%	6.0%	-0.5%
2007	34,958	34,575	69,533	446,874	6.8%	10.1%	8.4%	0.0%
2008	35,438	34,971	70,409	447,615	8.2%	11.3%	9.8%	0.1%
2009	34,985	34,862	69,847	453,324	6.9%	11.0%	8.9%	1.4%
2010	34,332	33,855	68,187	455,400	4.9%	7.8%	6.3%	1.9%

Source: Kansas Dept. of Education; 2010-11 employment data unaudited

Kansas' trend of growing non-teacher employment at a greater pace than teachers has occurred for decades. Chart 1, based on Census of Government years, illustrates the relative growth rates of key components of the total Kansas public school total FTE count (not the FTE-to-enrollment ratio).

It clearly reveals that teacher FTEs have been the slowest growing component. Non-teacher instructional FTEs (as defined in the Appendix) have exhibited the strongest growth. All Other FTEs (non-instructional FTEs) have exhibited the second strongest growth.

Chart 1: Relative Growth Rates of Enrollment and Types of Full-Time-Equivalent Employment

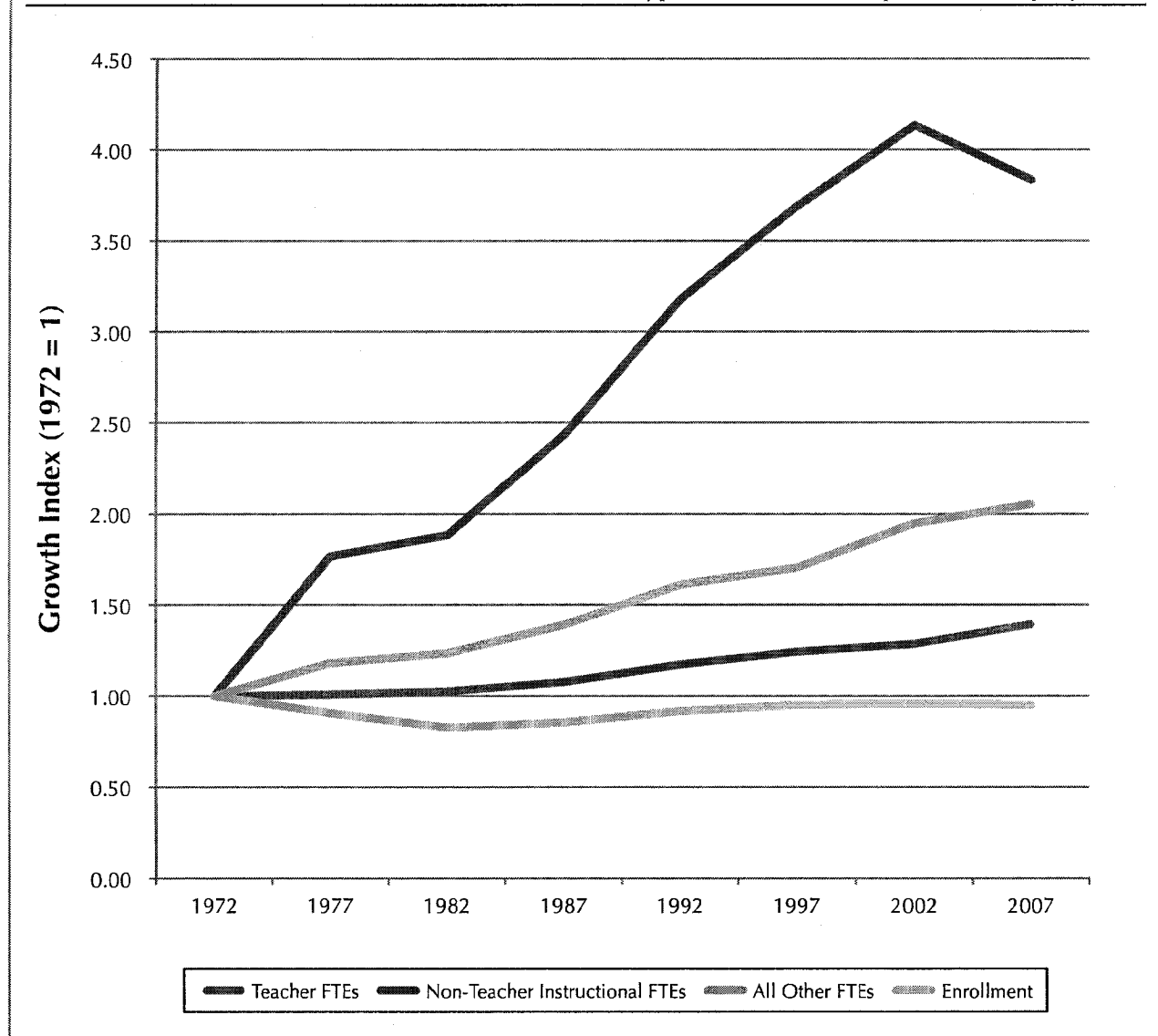


Table 3: Magnitude and Growth Rate, Full-Time-Equivalent Personnel per 100 Students

	1972	1977	1982	1987	1992	1997	2002	2007	Avg. Annual Growth 1972-2007
Total FTEs per 100 Students									
Kansas	8.39	10.50	11.91	12.80	13.74	14.32	15.49	16.15	1.78%
United States	7.84	9.07	10.07	11.19	11.34	11.97	13.05	13.56	1.49%
Plains	8.25	9.67	10.57	11.28	12.02	12.96	14.51	14.95	1.62%
KS + Contiguous	7.82	9.53	10.66	11.72	11.85	12.85	13.90	14.64	1.71%
Teacher FTEs per 100 Students									
Kansas	5.16	5.74	6.40	6.49	6.59	6.73	6.93	7.55	1.04%
United States	4.61	5.07	5.39	5.70	5.74	5.95	6.30	6.45	0.91%
Plains	4.86	5.52	6.00	6.24	6.22	6.53	6.98	7.22	1.08%
KS + Contiguous	4.64	5.40	5.88	6.08	6.20	6.39	6.79	7.06	1.14%
Non-Teacher Instructional FTEs per 100 Students									
Kansas	0.87	1.69	1.97	2.46	3.00	3.35	3.74	3.49	3.84%
United States	0.75	1.29	1.60	2.02	2.15	2.43	2.78	2.95	3.78%
Plains	0.90	1.34	1.42	1.75	2.37	2.75	3.24	3.16	3.44%
KS + Contiguous	0.81	1.27	1.51	2.08	2.18	2.65	2.75	2.88	3.50%
All Other FTEs per 100 Students									
Kansas	2.37	3.08	3.54	3.85	4.16	4.24	4.82	5.11	2.10%
United States	2.49	2.71	3.08	3.48	3.45	3.59	3.97	4.16	1.40%
Plains	2.49	2.80	3.14	3.29	3.43	3.69	4.30	4.57	1.66%
KS + Contiguous	2.38	2.85	3.27	3.56	3.47	3.81	4.36	4.70	1.86%

Source: U.S. Census Bureau; National Center for Education Statistics; Center for Applied Economics, KU School of Business

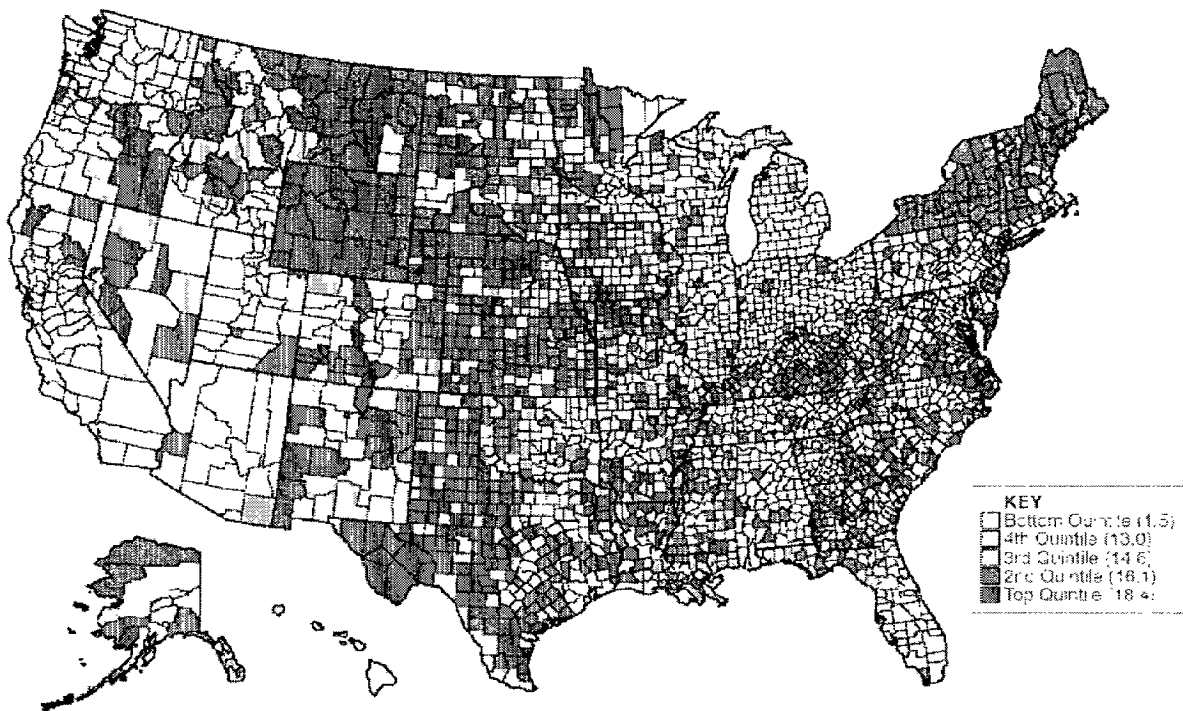
Table 3 compares the magnitude of the FTEs per 100 students in each category described in Chart 2, and reports the average annual growth rates from 1972 to 2007. Over a 35-year time span, small differences in growth rates compound to substantial differences in magnitude.

Among the comparison regions, Kansas had the highest annual average growth rate in each category except teachers. In 1972, per 100 students, Kansas ranked 7th highest among the states in terms of teachers, 21st highest in terms of non-teacher instructional personnel, and 32nd highest in all other personnel. In 2007, Kansas ranked 11th highest in terms of teachers, 18th highest in terms of non-teacher instructional personnel and 6th highest in terms of non-

instructional personnel. In sum, Kansas decreased its rank in terms of teachers per student and substantially increased its rank in terms of non-teachers per student.

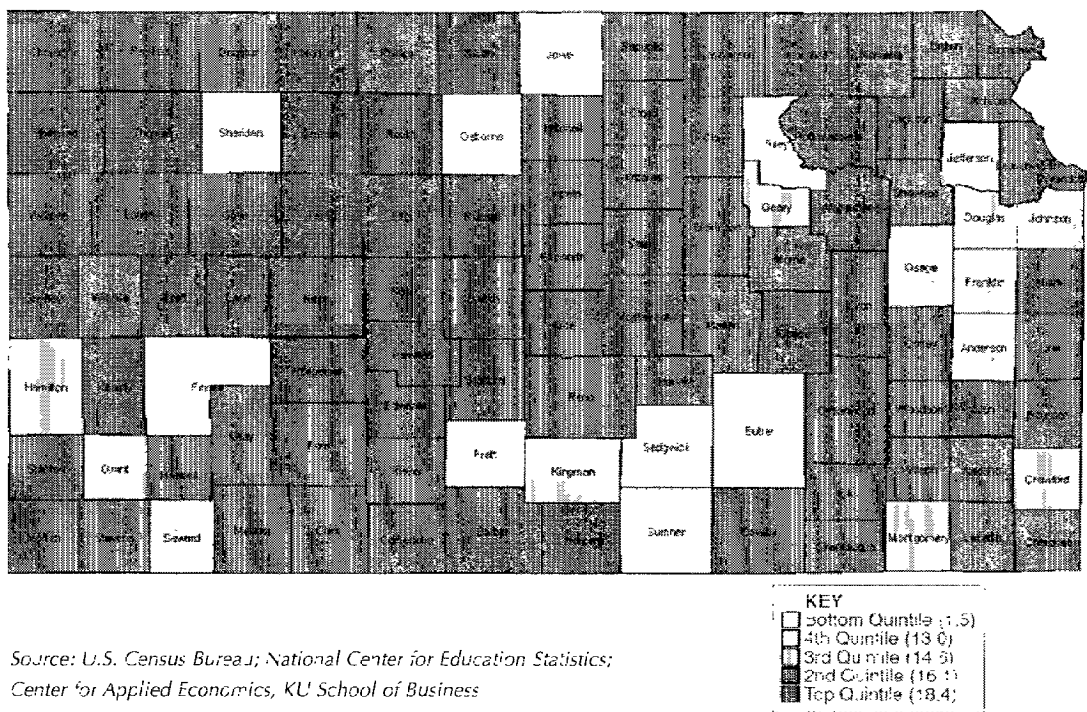
In terms of total FTEs per 100 students, Kansas ranked 14th in 1972 and ranked 8th in 2007. This growth had two basic drivers, according to the evidence represented in Chart 2 and Table 2: Kansas started from a higher base level of FTEs and has grown these levels at a rate, on average, that is faster than the comparison regions—with teacher FTEs being a key exception.

Map 2: Total K-12 Full-Time-Equivalent Employees per 100 Students by County, 2007



Source: U.S. Census Bureau; National Center for Education Statistics; Center for Applied Economics, KU School of Business

Map 3: Kansas Close-Up of Map 2



Source: U.S. Census Bureau; National Center for Education Statistics; Center for Applied Economics, KU School of Business

Map 2 and Map 3 provide a greater refinement to the geography associated with FTE levels. Map 2 illustrates on a county basis the level (color-coded by quintiles) of total public school FTEs per 100 students. The key for each map indicates in parentheses the level of FTEs per 100 students that mark the quintile break-points. For example, the top quintile begins at 18.4 FTEs per 100 students; the second quintile begins at 16.1 FTEs per 100 students. The data conform to the method that the U.S. Census Bureau uses to match school districts to counties. Because many school districts cross over county lines, the county-level data should be taken as illustrative but not perfectly precise.

The goal of the county-level analysis is to provide better geographic texture to public school employment levels. One immediately apparent pattern emerges from the greater geographic texture: rural counties tend to have higher levels of FTEs per student. A less obvious pattern is that counties experiencing a net out-migration of population tend to have higher levels of FTEs and counties experiencing net in-migration of population tend to have lower levels of FTEs.²

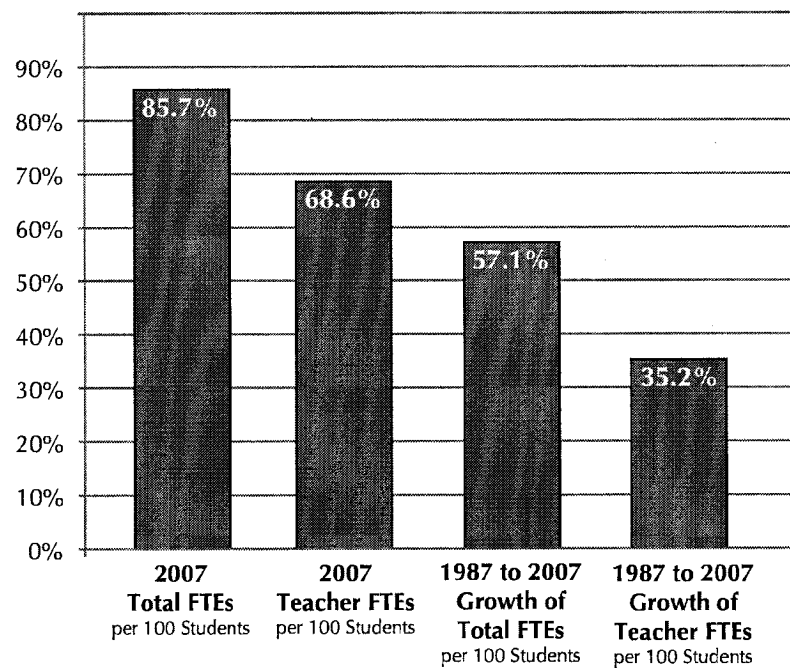
Net population out-migration and rural character have a strong association with the Great Plains. Map 2 and Map 3 show that Kansas fits into this greater pattern. However, as revealed by the data presented above, Kansas has tended to have higher public school FTE levels than most of the Plains states.

Chart 2 provides a summary of the 2007 data for Kansas counties. It uses the 50th percentile among all U.S. counties as a benchmark for comparison. For example, 86 percent of Kansas counties rank above the 50th percentile among all U.S. counties with regard to

total FTEs per 100 students. Almost 70 percent of Kansas counties rank above the 50th percentile in terms of teacher FTEs per 100 students. (A further refinement of the total FTE count shows that: Almost 50 percent of Kansas counties rank above the 80th percentile and almost 25 percent rank above the 90th percentile.)

Chart 2 also reports ranks of growth rates. The most reliable county-level data for teacher FTEs and enrollment begins in 1986, so the county analysis uses the 1987-2007 period to compare growth in FTEs per 100 students. Chart 2 shows that 57 percent of Kansas counties rank above the 50th percentile in terms of growth of total FTEs per 100 students; and 35 percent ranked above the 50th percentile in terms of the growth of teacher FTEs per 100 students. The more modest county levels and growth rates of teacher FTEs reinforces the other data in the report that indicates non-teacher FTEs, not teacher FTEs, represent a key difference in Kansas compared to other states and counties.

Chart 2: Percent of Kansas Counties Above 50th Percentile Compared to All U.S. Counties, Select Measures



² For county-level patterns of migration, see Arthur P. Hall, et al., "The County-to-County Migration of Taxpayers and Their Incomes, 1995-2006," Technical Report 09-0306, Center for Applied Economics, University of Kansas School of Business, March 2009.

Appendix: Data Sources and Definitions

This report relies on raw data from (1) the U.S. Census Bureau's Census of Governments, which takes place every five years (years ending in a 2 or 7), and (2) the National Center for Education Statistics.

The Census of Governments is an official census. The census of public sector employment uses the Census Bureau's own survey methodology to identify the employment levels (including full-time-equivalent calculations) and payroll levels as of March in the census year. The methodology is consistent and comparable across census years. For public education (elementary and secondary schools), the Census Bureau classifies employment and payroll into the following two broad categories:

Census of Governments Definitions

School Instructional Employees:

- Classroom Teachers
- Principals
- Supervisors of Instruction
- Superintendents
- Teacher Aides
- Substitute Teachers
- School Librarians
- Library Aides
- Guidance and Psychological Personnel

School Non-Instructional Employees (Other):

- Administrative and Clerical Employees
- Operations and Maintenance Employees
- Cafeteria Employees
- Bus Transportation Employees
- Health and Recreation Employees
- Paid Student Employees
- Unallocable Elementary and Secondary Education Employees

Source: http://ftp2.census.gov/govs/class06/ch_12.pdf (p. 12-9)

The Census of Governments makes no effort to breakout the individual components of its two broad categories. The National Center for Education Statistics, however, does make an effort to classify different components of elementary and secondary school employment. It also maintains data on student enrollment. The NCES data collection program relies on a partnership with state education agencies; unlike the Census Bureau, it does not have its own collection methodology, although it does have guidelines that strive to promote and maintain data consistency among the data reported by state agencies. The NCES has annual data for states that begins in 1970. It has county-level data that begins in 1986.

A side-by-side comparison of Census of Governments data and NCES data reveals a considerable amount of variation between the two data sets. Because the Census Bureau has maintained a standard data collection methodology over its Census of Governments program, this report relies on Census data when possible. When a breakdown of data is desirable, the report relies on NCES data. Accordingly, this report uses the following definitions:

- Total Full-Time-Equivalent (FTE) Employees—Raw data from Census of Governments
- Teacher FTEs—Raw data from the National Center for Education Statistics
- Non-Teacher Instructional FTEs—Census Instructional FTEs less NCES Teacher FTEs
- Non-Instructional FTEs—Raw data from Census of Governments
- Enrollment—Raw data from the National Center for Education Statistics (Headcount)

There is a known data issue with regard to Kansas. The NCES reports a sharp drop in the total number of full-time-equivalent public education employees from 2005 to 2006 (and carrying over to 2007, the Census of Government year). According to NCES data, supplied by the Kansas Department of Education, "All Staff" data drops by about 11,000. Teacher FTEs increased during the same time period, implying a drop of about 13,500 non-teaching FTEs.

The Kansas Department of Education (KSDE) provided several possible explanations for why the sharp drop shows up in the NCES data but not the Census data:

Beginning with the 2005-06 school year, KSDE implemented a student level collection system. In addition, the US Department of Education no longer required data to be submitted to NCES (the NCES Common Core of Data program used to gather data for this report) but rather in a new format referred to as EDEN (Education Data Exchange Network). When KSDE started reporting to the US Department of Education through EDEN, it changed the source for several data pieces that were submitted prior to 2005-06.

For years prior to 2005-06, a lot of the data submitted to NCES Common Core of Data program was collected on the Principal's Building Report or Superintendent's Organization Report (S066). Beginning with 2005-06 and thereafter for EDEN reporting, the federal and state offices were in a "transitional" period. Some members of KSDE staff in charge of the staff/teacher data at that time, recall that a change in staff categories may have taken place for data being reported beginning with the 2006-07 school year.

A Comparison of Data Sources

The main data sources often disagree with regard to student headcount and FTEs. The table below reports, for Census of Government years, the relevant data provided by the Kansas Department of Education (KSDE), the U.S. Census Bureau, and the National Center for Education Statistics (NCES). Attempts to resolve the discrepancies yielded no success. Each data source uses different methodologies and definitions.

The differences in some years between KSDE, Census, and NCES are large enough to make a qualitative difference in the results reported herein; however, the comparison exercise must rely on the data collections of the national agencies.

In 2007, data from KSDE indicates that Kansas had 14.7 FTEs per 100 students. If the U.S. Census Bureau FTE count and the NCES student count remain the same for all states except Kansas, the 14.7 FTEs per 100 students would give Kansas a rank of 23rd rather than 8th, as reported on Map 1.

School Year	KSDE Student Headcount	NCES Student Headcount	KSDE Total FTEs	Census Total FTEs	NCES Total FTEs
1972	493,745	491,765	n/a	41,266	43,558
1977	443,341	446,592	n/a	46,903	45,593
1982	407,074	407,074	n/a	48,469	44,757
1987	421,112	421,112	n/a	53,883	47,569
1992	451,536	451,536	51,627	62,055	54,185
1997	468,744	468,687	52,985	67,096	59,604
2002	467,326	470,957	63,992	72,931	63,907
2007	471,566	468,295	69,533	75,610	54,184

About The Author

Arthur P. Hall is the founding Executive Director of the Center for Applied Economics at the University of Kansas School of Business. Before joining the KU School of Business, Hall was Chief Economist in the Public Affairs group of Wichita, KS-based Koch Industries, Inc. In that capacity, he worked with business leaders to help define how public policy initiatives would influence the structure of the markets in which the company participates. Koch sponsored Hall's directorship of Kansas Governor Sebelius' Budget Efficiency Savings Teams from April 2003 until his departure from the firm in February 2004.

Before joining Koch Industries in May 1997, Hall was Senior Economist at the Washington, D.C.-based Tax Foundation, where he produced quantitative and qualitative research pertaining to the economics of taxation, and acted as an economic advisor to The National Commission on Economic Growth and Tax Reform. Before that, he worked as a financial economist at the U.S. General Accounting Office. Hall has taught university economics at both the undergraduate and MBA level. He received his Ph.D. in economics from the University of Georgia and his B.A. in economics from Emory University.



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Table 2: Comparative Trends of Kansas FTE Employment and Enrollment

Year	FTE Employees			FTE Students	Cumulative Change Since 2000			
	Teachers	All Other	Total		Teachers	Other Employees	Total Employees	FTE Students
2000	32,742	31,409	64,150	446,970				
2001	33,084	32,071	65,155	445,377	1.0%	2.1%	1.6%	-0.4%
2002	32,658	31,334	63,992	444,541	-0.3%	-0.2%	-0.2%	-0.5%
2003	32,609	31,322	63,931	443,302	-0.4%	-0.3%	-0.3%	-0.8%
2004	32,825	31,182	64,007	441,686	0.3%	-0.7%	-0.2%	-1.2%
2005	33,479	31,915	65,394	442,556	2.3%	1.6%	1.9%	-1.0%
2006	34,351	33,628	67,979	444,879	4.9%	7.1%	6.0%	-0.5%
2007	34,958	34,575	69,533	446,874	6.8%	10.1%	8.4%	0.0%
2008	35,438	34,971	70,409	447,615	8.2%	11.3%	9.8%	0.1%
2009	34,985	34,862	69,847	453,324	6.9%	11.0%	8.9%	1.4%
2010	34,332	33,854	68,186	454,864	4.9%	7.8%	6.3%	1.8%
2011	34,075	33,785	67,860	456,684	4.1%	7.6%	5.8%	2.2%

Source: Kansas Dept. of Education

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CAREER EXPERIENCE

Executive Director—Center for Applied Economics (February 2004-Present) School of Business, University of Kansas, Lawrence, KS

- ◆ Direct an economic research center focused on analysis and education that supports regional economic development and related public policy analysis.
- ◆ Engaged in all aspects of Center-related management and scholarship.
- ◆ Lecturer in Economics, University of Kansas School of Business

Chief Economist—Public Sector Group (1997-2004) Koch Industries, Inc., Wichita, KS

- ◆ Applied microeconomic and industry analysis: Within this Fortune 50-size, diversified energy company, led the effort to develop and manage systems, processes, and teams that helped create a superior understanding of the array of public policy issues that confronted the company and its competitive position.
- ◆ March 2003-March 2004, worked half-time as a "loaned executive" to the Sebelius Administration of the State of Kansas. Led statewide effort to develop and implement process changes to (1) improve the efficiency and effectiveness of state operations and (2) institute a culture of collaboration and resource-sharing among state agencies.
- ◆ Led Public Sector Group's effort (as liaison to the corporation) to design and implement a document/records management system.
- ◆ From 2000-2002, led the effort to create (and managed to maturity) a corporate-wide "emerging issues" process to better aid the firm's knowledge and planning systems. Required development of knowledge management systems across 10 different businesses.
- ◆ From 1999-2001, worked as Public Sector Group's Director of Finance. Guided by the company's internal consultant billing model, improved the transparency and automation of the financial reporting, cost management, and budgeting systems. Oversaw the group's information technology personnel and resource requirements.

Adjunct Professor (1999-2002) Baker University, Wichita, KS Campus

- ◆ Taught 13 sessions of Managerial Economics, a required course within the accelerated MBA program.
- ◆ Helped create a significantly improved student rating of this course by emphasizing the application of economic theory to the field of business strategy.

Senior Economist (1991-1997) Tax Foundation, Washington, D.C.

- ◆ Produced quantitative and qualitative research pertaining to the economics of taxation.

Arthur Pendleton Hall

Page 2

Acted as an economic advisor to The National Commission on Economic Growth and Tax Reform. Research on state-by-state individual effective tax rates became a key feature of Intuit's Quicken Financial Planner personal finance software.

- ◆ Research published in leading trade journals and major newspapers. Analysis frequently cited by members of Congress and used by major news media.
- ◆ Solid public speaking experience: television, talk radio, speeches, and testimony before Congress. Extensive interaction with all levels and types of news media.
- ◆ Planned, organized, and marketed state-level fiscal policy seminars.
- ◆ From 1991-1992, worked as Director of Research for Citizens for a Sound Economy, the Tax Foundation's parent organization at the time. Primary editor and advisor for economic policy research in all subject areas.

Financial Economist (1990-1991)

U.S. General Accounting Office, Washington, D.C.

- ◆ Investigated issues of interest to the U.S. Congress as they pertained to the savings and loan and banking industries, with particular emphasis on regulatory capital levels.
- ◆ Extensive IBM mainframe programming using SAS statistical software to analyze data on U.S. banking and savings and loan industries.

Instructor of Economics (1987-1990)

University of Georgia, Athens, Georgia.

- ◆ Designed in-depth study programs and refined lecture delivery techniques: Money and Banking (4 semesters); Microeconomic Principles (5 semesters). Class sizes: 15-250.
- ◆ Recipient of a University-wide Outstanding Graduate Teaching Award.

Loan Originator (1988-1989)

Investor's Equity Mortgage, Winder, Georgia.

- ◆ Developed greater Athens, Georgia as a source of mortgage loan applicants by cold calling, independent advertising, and consultation with Realtors. Established and managed correspondent relationship with rural banking company.
- ◆ Recruited investor for multi-million dollar condominium financing program.

Economist (1986 — Internship)

CH2M Hill, Montgomery, Alabama.

- ◆ Within this engineering consultant firm, designed computer algorithm to price natural gas in an economic environment of competing industrial fuels. Participated in impact and feasibility studies for municipal utilities throughout the Southeast.

EDUCATION

Ph.D. (1991), Economics, University of Georgia, Athens, Georgia.

B.A. (1985), Economics, Emory University, Atlanta, Georgia.