GAO

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HIGHER EDUCATION

Schools' Use of the Antitrust Exemption Has Not Significantly Affected College Affordability or Likelihood of Student Enrollment to Date

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GAO-06-963

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Highlights

Highlights of GAO-06-963, a report to congressional committees

HIGHER EDUCATION

Schools' Use of the Antitrust Exemption Has Not Significantly Affected College Affordability or Likelihood of Student Enrollment to Date

Why GAO Did This Study

In 1991 the U.S. Department of Justice sued nine colleges and universities, alleging that they had restrained competition by making collective financial aid determinations for students accepted to more than one of these schools. Against the backdrop of this litigation, Congress enacted a temporary exemption from antitrust laws for higher education institutions in 1992. The exemption allows limited collaboration regarding financial aid practices with the goal of promoting equal access to education. The exemption applies only to institutional financial aid and can only be used by schools that admit students without regard to ability to pay.

In passing an extension to the exemption in 2001, Congress directed GAO to study the effects of the exemption. GAO examined (1) how many schools used the exemption and what joint practices they implemented, (2) trends in costs and institutional grant aid at schools using the exemption, (3) how expected family contributions at schools using the exemption compare to those at similar schools not using the exemption, and (4) the effects of the exemption on affordability and enrollment. GAO surveyed schools, analyzed school and student-level data, and developed econometric models. GAO used extensive peer review to obtain comments from outside experts and made changes as appropriate.

www.gao.gov/cgi-bin/getrpt?GAO-06-963.

To view the full product, including the scope and methodology, click on the link above. For more information, contact Cornelia Ashby at (202) 512-7215 or ashbyc@gao.gov.

What GAO Found

Twenty-eight schools—all highly selective, private 4-year institutions—formed a group to use the antitrust exemption and developed a common methodology for assessing financial need, which the group called the consensus approach. The methodology used elements already a part of another need analysis methodology; schools modified this methodology and reached agreement on how to define those elements. By the 2004-2005 school year, 25 of 28 schools in the group were using the consensus approach. Schools' implementation of the approach varied, however, with officials from 12 of the 25 schools reporting that they partially implemented it, in part because they believed it would be costly to do so.

Over the last 5 years, tuition, room, and board costs among schools using the antitrust exemption increased by 13 percent compared to 7 percent at all other private 4-year schools not using the exemption. While the amount of institutional aid at schools using the exemption also increased—it did so at a slower rate. The average institutional grant aid award per student increased by 7 percent from $18,675 in 2000-2001 to $19,901 in 2005-2006.

There was virtually no difference in the amount students and their families were expected to pay between schools using the exemption and similar schools not using the exemption. While officials from schools using the exemption expected that students accepted to several of their schools would experience less variation in the amount they were expected to pay, GAO found that students accepted to schools using the exemption and comparable schools not using the exemption experienced similar variation in the amount they were expected to pay. Not all schools using the consensus approach chose to adopt all the elements of the methodology, a factor that may account for the lack of consistency in expected family contributions among schools using the exemption.

Based on GAO's analysis, schools' use of the consensus approach did not have a significant impact on affordability—the amount students and families paid for college—or affect the likelihood of enrollment at those schools to date. While GAO found that the use of the consensus approach resulted in higher amounts of need-based grant aid awarded to some student groups compared to their counterparts at schools not using the consensus approach, the total amount of grant aid awarded was not significantly affected. It was likely that grant aid awards shifted from non-need-based aid, such as academic and athletic scholarships, to aid based on a student's financial need. Finally, implementing the consensus approach did not increase the likelihood of low-income or minority students enrolling at schools using the consensus approach compared to schools that did not.

The group of schools using the exemption reviewed this report and stated it was a careful and objective report. However, they had concerns about the data used in GAO's econometric analysis, which GAO believes were reliable.

_____ **United States Government Accountability Office**

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September 21, 2006

Congressional Committees

In 1991, the U.S. Department of Justice sued nine colleges and universities, alleging that by collectively making financial aid determinations for students accepted to more than one of these schools, the schools had unlawfully conspired to restrain trade in violation of the Sherman Act. Specifically, Justice argued that by agreeing upon the amount of money that the families of admitted students would be expected to pay towards their student's education, these schools were engaging in price fixing. Justice and the schools ultimately reached settlements that ended these activities. These schools, which are among the nation's most prestigious private universities, had engaged in these activities for more than 30 years.

Against the backdrop of this litigation, in 1992 Congress enacted a temporary exemption from the antitrust laws for higher education institutions that has been renewed several times and is set to expire in 2008. Under the exemption, schools are allowed a limited degree of collaboration on financial aid practices in the hope that it would further the government's goal of promoting equal access to educational opportunities for students, including low income and minority students. Under the exemption, schools that admit students without regard to ability to pay would be able to develop and use common principles of financial aid policies and make changes to formulas used to calculate financial aid awards, but not discuss specific students' awards. Specifically, such schools would be allowed to engage in the following joint practices:

1. agreeing to award financial aid only on the basis of demonstrated financial need;

2. using common principles of analysis for determining financial need;

3. using a common aid application form; and

4. exchanging, through an independent third party, financial information submitted by students and their families.

The exemption only applies to an institution's own aid. Federal aid, which is allocated based on a statutory formula, was not targeted by the exemption. Proponents of the exemption believe that common principles

could lead to a more equitable allocation of aid, make attendance at schools using the exemption more affordable, and, in turn, increase enrollment of low income students at these schools. Moreover, proponents believe that allowing schools to use common principles for determining financial need should reduce variation among schools in what a family is expected to pay and enable students to choose a school without making cost the defining factor. On the other hand, some are concerned that exempting schools from antitrust laws would reduce competition. Specifically, with less competition, some students would pay more for college because their opportunities to consider price differences when choosing schools would be diminished.

In passing the 2001 extension to the exemption, Congress directed GAO to study whether the exemption resulted in changes in the amount students and their families would pay for college. In response to this mandate, we determined: (1) how many schools used the exemption and what joint practices these schools implemented, (2) trends in cost of attendance and institutional grant aid at schools using the exemption, (3) how expected family contributions at schools using the exemption compare to those at similar schools that did not use the exemption, and (4) the effects of the exemption on affordability and enrollment.

To determine the number of schools that made use of the exemption since 1992, we reviewed literature and studies on the exemption, interviewed higher education associations, and reviewed documents that identified a group of schools that were using the exemption. We interviewed officials of these schools, reviewed reports of their activities, and collected information on their financial aid policies. To determine if other schools might have formed groups to participate in activities allowed under the exemption, we also surveyed selected similar schools and found no such other groups.

To determine trends in cost of attendance—tuition, room, and board—and institutional grant aid at the schools using the exemption, we collected data from them and supplemented it with information available from the U.S. Department of Education's Integrated Postsecondary Education Data System (IPEDS) for school years 2000-2001 through 2005-2006. We received data from 26 of the 28 schools using the exemption. We determined that the IPEDS and institutional data were sufficiently reliable and valid for purposes of our review.

To determine how expected family contributions (EFC) at schools using the exemption compared to those at similar schools not using the

exemption, we collected and compared student-level EFC data from both sets of schools as of April 1, 2006. To assess the extent of variation in EFC across multiple schools, we isolated the EFCs of individual students accepted at (1) multiple schools using the exemption, (2) multiple schools not using the exemption, and (3) both schools using the exemption and schools that did not. While EFC determinations of students accepted at both schools using the exemption and those that did not best show the extent of variation because it allows us to control for differences in student characteristics, this group of students was small. Thus, we supplemented our analysis with data from the other two groups listed. Based on our discussions with school officials on the steps taken to ensure reliability of the EFC data, we determined that the data were sufficiently reliable and valid for purposes of our review. See appendix I for further details of our statistical analysis.

To assess the effects of the exemption on affordability and enrollment, we developed econometric models to examine the effects of the exemption on tuition, financial aid (including grants and loans), amount paid for college (measured by the total cost of attendance less total grant aid), and student enrollment at schools using the exemption. Determining "effect" requires both a treatment group (those schools using the exemption) and a control group (a comparable set of schools that did not use the exemption) as well as controlling for variations in the actions of the schools over time that are independent of the exemption. Differences found between the two groups in terms of affordability and enrollment (effects) can then be attributed to the exemption (treatment). GAO's econometric analysis was focused on the mandate from Congress that requires us to examine the effects of the exemption. It is different from a market-specific analysis conducted in an antitrust investigation and is not intended to address whether or not conduct may be taking place that might violate the antitrust laws in the absence of the exemption. In order to find a comparative set of schools, we used the *U.S. News and World Report* annual rankings of the "best colleges." We obtained school-level data from IPEDS and student-level data from the National Postsecondary Student Aid Study for academic years 1995-1996, 1999-2000, and 2003-2004. We also collected data from other sources, including a GAO survey of the schools using the exemption and the comparable schools. We analyzed whether there were any effects on affordability and enrollment at schools using the exemption for all students and whether there were differences by family income or race. We also controlled for other factors that could cause changes in affordability and enrollment, such as school or student characteristics. Because of data limitations, we were not able to include all schools using the exemption in the treatment group. Nevertheless, there were sufficient similarities

between the excluded schools and the schools we included in our model to allow for a meaningful analysis. In developing the models, we reviewed several studies on the economics of higher education. We provided a detailed draft outline of our econometric methodology, including a description of the types and sources of data we used, to outside experts with whom we consulted on the design and analysis because of their in-depth knowledge of antitrust law and the economics of higher education. We also provided a draft of our report to peer reviewers in academia and incorporated their comments when appropriate. See appendixes II and III for a detailed explanation of our econometric analysis. We conducted our work in accordance with generally accepted government auditing standards between May 2005 and September 2006.

Results in Brief

Twenty-eight schools—all highly selective, private 4-year institutions—formed a group to use the antitrust exemption, and of the four collaborative activities allowed, the group has engaged in only one—development of a common methodology for assessing financial need, which the group called the "consensus approach." With respect to the other three activities allowed under the exemption, the schools either chose not to engage in the activities or piloted them on a limited basis. For example, three schools in the group attempted to share student-level financial aid data through a third party. However, the schools reported that because the effort was too burdensome and yielded little useful information, they chose not to continue. The consensus approach to need analysis developed by the group is based on elements already a part of another need analysis methodology that considers a family's income and assets to determine a student's ability to pay for college. Schools modified some elements of that methodology and reached agreement on how to define those elements. Although schools in the group agreed to the concept of the consensus approach, the schools varied in their implementation of the methodology. Schools that partially implemented or did not implement the consensus approach often cited concerns about potential increased costs associated with implementing the methodology. Twenty five of the 28 schools implemented the consensus approach methodology; three did not. Schools that chose to use part or all of the elements of the consensus approach did so between 2002 and 2005.

Over the last 5 years, tuition, room, and board costs at the group of schools using the exemption increased, and while the amount of grant aid these schools provided to students also increased, it did so at a slower rate. Between school years 2000-2001 and 2004-2005, tuition, room, and board increased by 13 percent, from $38,319 to $43,164, compared to a 7

percent increase at other private 4-year not-for-profit schools. Average institutional grant aid awards increased by 7 percent from $18,675 to $19,901 at schools using the exemption, and the percentage of students receiving such aid increased from 37 to 40 percent, from school years 2000-2001 to 2005-2006. Among students receiving institutional grant aid awards, the percent of students who received need-based institutional grant aid at schools using the exemption increased from 34 to 36 percent, and the percent of students receiving non-need-based institutional grant aid awards (i.e., academic or athletic scholarships) also increased slightly from 2 to 4 percent.

We found virtually no difference in the amounts students and their families were expected to pay at schools using the exemption compared to similar schools not using the exemption. Average expected family contribution (EFC) for students accepted at schools using the exemption was $27,166 and for those accepted at comparable schools not using the exemption was $27,395 in school year 2005-2006. While officials from schools using the exemption expected that students accepted to several of their schools would experience less variation in their EFC, we found that the variation in the EFC for a student who was accepted to several schools using the exemption was similar to the variation in EFC that same student received from schools not using the exemption. The variation in EFCs for these students was about $6,000 at both sets of schools. Not all schools using the consensus approach chose to adopt all the elements of the methodology, a factor that may account for the lack of consistency in EFCs among schools using the exemption. For example, seven schools chose not to use the consensus method for considering home equity that could have contributed to the variation in EFCs at schools using the exemption.

Based on our analysis, schools' use of the consensus approach did not have a significant impact on affordability—the amount students and families paid for college, which is measured by the total cost of attendance less total grant aid—or affect the likelihood of enrollment at schools using the exemption. While we found that the use of the consensus approach resulted in higher amounts of need-based grant aid awarded to some student groups (middle income, Asian students, and Hispanic students) compared to their counterparts at schools not using the consensus approach, the total amount of grant aid awarded did not significantly change. It is likely that because the change in total grant aid was similar compared to the change at schools not using the consensus approach, the increase in need-based grant aid was offset by a decrease in non-need-based aid, such as academic scholarships. We also found that low income students at schools using the consensus approach, compared to those at

schools not using the consensus approach, received a significantly higher amount of total aid, which includes both grants and loans. However, the amount of grant aid that these students received did not significantly change, which suggest they likely received more aid in the form of loans, which they would need to repay. Additionally, implementing the consensus approach did not affect the likelihood of low-income or minority students enrolling at schools using the consensus approach compared to schools that did not. Because we have data for only one year after implementation, it is possible that some eventual effects of the consensus approach may not be captured. The effects of using the consensus approach could be gradual, rather than immediate, and therefore may not be captured until later years.

We provided the group of schools using the antitrust exemption, Secretary of Education, and Attorney General with a copy of our draft report for review and comments. The group of schools using the exemption reviewed a draft of this report and stated it was a careful and objective report, but raised concerns about the data used in our econometric analysis and the report's tone and premise. We believe that the data we used were reliable to support our conclusions. The group of schools using the exemption also provided technical comments, which we incorporated where appropriate. The group's written comments appear in appendix IV. The Department of Education reviewed the report and did not have any comments. The Department of Justice provided technical comments, which we incorporated where appropriate.

Background

Legal History of Antitrust Exemption for Higher Education Institutions

In the early 1990's the U.S. Department of Justice (Justice) sued nine universities and colleges, alleging that their practice of collectively making financial aid decisions for students accepted to more than one of their schools restrained trade in violation of the Sherman Act.[1] By consulting about aid policies and aid decisions, through what was known as the Overlap group, the schools made certain that students who were accepted to more than one Overlap school would be expected to contribute the same towards their education. Thus, according to Justice, "fixing the

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[1]The schools sued were: Brown University, Columbia University, Cornell University, Dartmouth College, Harvard College, Massachusetts Institute of Technology, Princeton University, University of Pennsylvania, and Yale University.

prices" students would be expected to pay. All but one school, Massachusetts Institute of Technology (MIT), settled with Justice out of court, ending the activities of the Overlap group. The District Court ruled that MIT's joint student aid decisions in the Overlap group violated the Sherman Act. On appeal, the Third Circuit Court of Appeals agreed with the District Court that the challenged practices were commercial activity subject to the antitrust laws. However, it reversed the judgment and directed the District Court to more fully consider the procompetitive and noneconomic justifications advanced by MIT during the court proceedings and whether social benefits attributable to the practices could have been achieved by means less restrictive of competition.[2] In recognition of the importance of financial aid in achieving the government's goal of educational access, but also mindful of the importance of antitrust laws in ensuring the benefits of competition, the Congress passed a temporary antitrust exemption.[3] In 1994, Congress extended the exemption and specified the four collective activities in which schools that admit students on a need-blind basis could engage.[4] The exemption was extended most recently in 2001, and is set to expire in 2008.[5]

Determining a Student's Financial Need

For many students, financial aid is necessary in order to enroll in and complete a postsecondary education. In school year 2004-2005, about $113 billion in grant, loan, and work-study aid was awarded to students from a variety of federal, state, and institutional sources.[6] Need analysis methodologies are used to determine the amount of money a family is expected to contribute toward the cost of college and schools use this information in determining how much need-based financial aid they will award. For the purposes of awarding federal aid, expected family contribution (EFC) is defined in the Higher Education Act of 1965, as amended, as the household financial resources reported on the Free Application for Federal Student Aid, minus certain expenses and

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[2]*U.S. v. Brown*, 5 F.3d 658 (3rd Cir. 1993). The Department of Justice and MIT subsequently entered into a settlement agreement in which MIT agreed to certain "Standards of Conduct."

[3]Pub. L. No. 103-325 (1992).

[4]Pub. L. No. 103-382 (1994).

[5]Pub. L. No. 107-72 (2001).

[6]Some financial aid is awarded to students based on merit rather than financial need.

allowances. The student's EFC is then compared to the cost of attendance to determine if the student has financial need. (see fig. 1)

Figure 1: Determining a Student's Financial Need
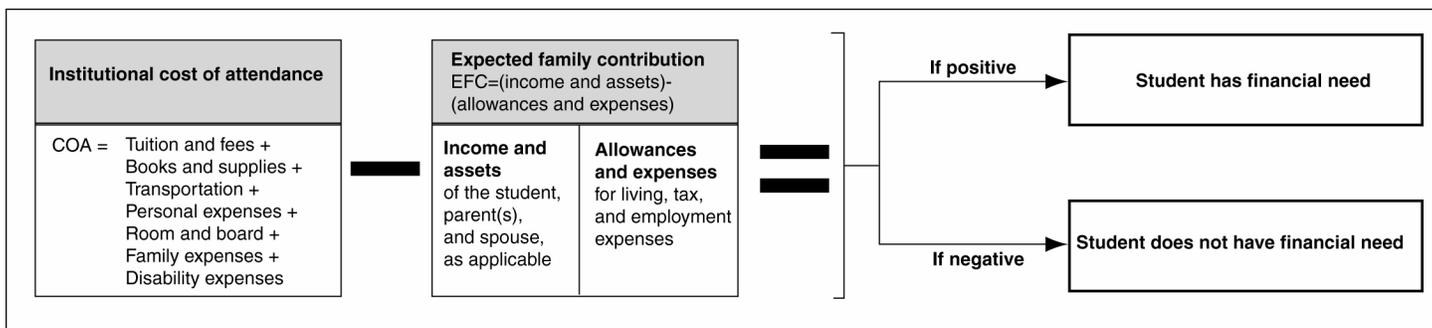
Source: GAO analysis of the Higher Education Act.

While the federal methodology is used to determine a student's eligibility for federal aid, some institutions use this methodology to award their own institutional aid. Others prefer a methodology developed by the College Board (called the institutional methodology) or their own methodology.[7] Schools that use the institutional methodology require students to complete the College Scholarship Service/Financial Aid PROFILE application and the College Board calculates how much they and their families will be expected to contribute toward their education. Schools that use these alternative methodologies feel they better reflect a family's ability to pay for college because they consider many more factors of each family's financial situation than the federal methodology. For example, the institutional methodology includes home and farm equity when calculating a family's ability to pay for college, while the federal methodology excludes them. See table 1 below for a comparison of the federal methodology to the institutional methodology.

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[7]The College Board is a not-for-profit membership association composed of more than 5,000 schools, colleges, universities, and other educational organizations. In conjunction with financial aid professionals and economists, the College Board developed its own methodology to measure a family's ability to pay for college.

Table 1: Comparison of the Federal Methodology and the College Board's Base Institutional Methodology for Need Analysis

	Federal methodology	Institutional methodology
Home equity	Not included.	Included.
Family farm equity	Not included.	Included.
Student assets	Included, 35 percent of student's net worth expected to be used for college costs. Minimum contribution from student expected.	Included, 25 percent of student's net worth expected to be used for college costs. Minimum contribution from student expected.
Family assets	Excluded the assets of families whose income fell below $50,000 and who filed a simple tax return.	Included a fuller range of family assets, such as home equity, other real estate, and business and farm assets.
	12 percent of assets expected to be used towards college.	5 percent of assets expected to be used towards college.
Divorced and separated families (Noncustodial parent contribution)	Excluded noncustodial parent income and assets.	Included noncustodial parent income and assets.
Total income	Included only the adjusted gross income reported on federal tax returns, plus various categories of untaxed income.	Included in total income any untaxed income and any paper depreciation and business, rental, or capital losses that artificially reduced adjusted gross income.
Medical/elementary and secondary school expenses	Not included.	Included.[a]
Cost of living variance	Not included.	Not included.[b]
Number of siblings in college	Included—divides the parental contribution by the number of siblings enrolled in college.	Included—instead of dividing by the number in college, parental contribution per student reduced by 40 percent for 2 in college and by 55 percent for 3.

Source: GAO analysis.

Notes: The institutional methodology is the base one provided by the College Board to schools. A school may select other options available in the institutional methodology when assessing a student's financial need.

[a]Elementary and secondary school expenses are an option that could be added by a school.

[b]Cost of living variance is an option that could be used by a school.

Twenty-Eight Schools Used the Antitrust Exemption to Develop a Common Methodology for Assessing a Family's Financial Need

Twenty-eight schools formed a group under the antitrust exemption and engaged in one of the four activities allowable under the exemption. School officials believed that the one activity—development of a common methodology for assessing financial need—would help reduce variation in amounts students were expected to pay when accepted to multiple schools and allow students to base their decision on which school to attend on factors other than cost. In developing the common methodology, called the consensus approach, schools modified an existing need analysis methodology and reached agreement on how to treat each element of the methodology. While the schools reached agreement on a methodology, implementation of the methodology among the schools varied.

Highly Selective Private 4-Year Colleges and Universities Formed a Group to Participate in Activities Allowable under the Exemption

Twenty-eight schools, all of which have need-blind admission policies as required under the law, formed the 568 Presidents' Group in 1998 with the intent to engage in activities allowed by the antitrust exemption.[8] Members of the group are all private 4-year schools that have highly selective admissions policies. One member school dropped out of the group because the school no longer admitted students on a need-blind basis. (See table 2 below for a list of current and former member schools.)

Table 2: Schools Using the Antitrust Exemption, as of May 2006

Amherst College	**Middlebury College**
Boston College	Northwestern University
Brown University	Pomona College
Claremont McKenna College	Rice University
Columbia University	Swarthmore College
Cornell University	University of Chicago
Dartmouth College	University of Notre Dame
Davidson College	University of Pennsylvania
Duke University	Vanderbilt University
Emory University	Wake Forest University
Georgetown University	Wellesley College
Grinnell College	Wesleyan University
Haverford College	Williams College
Massachusetts Institute of Technology	Yale University

Source: GAO analysis.

Note: Bowdoin College and Macalester College were once members of the group.

Membership is open to colleges and universities that have need blind admissions policies in accordance with the law. Member schools must (1) sign a certificate of compliance confirming the institution's need-blind admissions policy and (2) submit a signed memorandum of understanding that indicates willingness to participate in the group and adhere to its guidelines. Additionally, members share in paying the group's expenses.

In addition to the group's 28 members, 6 schools attended meetings of the group to observe and listen to discussions, but have not become

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[8]568 refers to the section in the Improving America's Schools Act of 1994 where the exemption is contained.

members.[9] In order to attend meetings, observer schools were required to provide a certificate of compliance stating that they had a need-blind admission policy. Observer schools explained that their participation was based on a desire to be aware of what similar schools were thinking in terms of need analysis methodology, as well as have an opportunity to participate in these discussions. Despite these benefits, observer schools said they preferred not to join as members because they did not wish to agree to a common approach to need analysis or they did not want to lose institutional independence.

Other institutions with need-blind admissions reported that, although eligible to participate in activities allowed by the exemption, they were not interested or not aware of the group formed to use the antitrust exemption. Some told us that they did not understand how students would benefit from the schools' participation in such activities. Others cited limited funding to make changes to their need analysis methodology and concerns that they would lose the ability to award merit aid to students.[10]

Participating Schools Agreed to a Common Methodology for Assessing Financial Need, but Schools Varied in Their Implementation of the Methodology

Of the four activities allowed under the antitrust exemption, the 28 schools engaged in only one—development of the consensus approach for need analysis. With respect to the other three activities allowed under the exemption, the schools either chose to not engage in the activities or piloted them on a limited basis. For example, three schools in the group attempted to share student-level financial aid data through a third party. However, they reported that because the effort was too burdensome and yielded little useful information, they chose not to continue. The group also expressed little need or interest in creating another common aid application form as such a form already existed. Schools also decided to leave open the option to award aid on a non-need basis.

According to the officials representing the 28 schools, the main purpose of the group was to discuss ways to make the financial aid system more understandable to students and their families and commit to developing a common methodology for assessing a family's ability to pay for college, which they called the consensus approach. Developing an agreed upon

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[9]These schools were: California Institute of Technology, Case Western University, Harvard University, Stanford University, Syracuse University, and University of Southern California.

[10]Participation in the 568 Presidents' Group, however, does not prohibit members from awarding merit aid.

common approach to need analysis, according to school officials, might help decrease variation in what families were expected to pay when accepted to multiple schools, allowing students to base their decision on what school to attend on factors other than cost. School officials also believed that agreeing to a common need analysis methodology would produce expected family contributions that were reasonable and fair for families and allow schools to better target need-based aid. The group did not address the composition of a student's financial aid package; specifically, what combination of grants, loans, or work-study a student would receive.

In developing the consensus approach for need analysis, the schools modified elements already in the College Board's institutional methodology, but member schools agreed to treat these elements the same when calculating a student's EFC. Some of the modifications that the group made to College Board's institutional methodology were later incorporated into the institutional methodology. The consensus approach and the institutional methodology similarly treat income from the non-custodial parent, and both account for the number of siblings in college in the same manner when calculating a student's expected family contribution. However, there are differences in how each methodology treats a family's home equity and a student's assets. For example, the institutional methodology uses a family's entire home equity in its assessment of assets available to pay for college, while the consensus approach limits the amount of home equity that can be included. According to one financial aid officer at a member school, including the full amount of a family's home equity was unfair to many parents because in some areas of the country the real estate market had risen so rapidly that equity gains inflated a family's assets. Officials representing some member schools stated that adjustments to home equity would likely affect middle and upper income families more than lower income families who are less likely to own a home. Table 3 below further illustrates the differences and similarities between the consensus approach and the institutional methodology.

Table 3: Comparison of Consensus Approach Developed by Schools Using the Antitrust Exemption Compared to the College Board's Institutional Methodology

	Institutional methodology	Consensus approach
Home equity	Included. No limit on amount considered asset available to pay for college.	Included. Home value is capped at 2.4 times income minus mortgage debt.
Family farm equity	Included.	Included.
Student and family assets	Included, but assets counted separately. 25 percent of student's net worth expected to be used for college costs. 5 percent of parent's assets expected to be used for college costs.	Included. In general student assets—such as prepaid and college savings plans are combined with family assets. 5 percent of family assets expected to be used for college. Trust funds will be considered on a case by case basis.
Divorced and separated families (Noncustodial parent)	Included. Expects noncustodial parent to contribute towards college costs.	Same as IM.
Total income/adjusted gross income	Included in total income any untaxed income and any paper depreciation and business, rental, or capital losses which artificially reduced adjusted gross income.	Excluded business and rental losses from calculation of income.
Medical/elementary and secondary school expenses	Included.[a]	Included.
Cost of living variance	Excluded.[b]	Adjusted living expenses based on geographic location. Takes into consideration that it is more costly to live in some areas of the country.
Number of siblings in college	Included—considers number of children enrolled in college, but instead of dividing by the number in college, it reduced the parental contribution for each student by 40 percent if 2 in college and by 55 percent if 3.	Same as IM.
One-time income adjustment	Not included.[c]	Excluded income that was not received on an annual basis, such as unemployment income or capital gains.
Family debt	Not included.	Made allowance for debt payments on loans incurred by parents for student's education.

Source: GAO analysis.

Note: The consensus approach is being compared to the base institutional methodology. Schools may choose to implement other options available under the institutional methodology when assessing a student's financial need.

[a]Private elementary and secondary school tuition allowed at the option of the institution.

[b]As an option schools can adjust living expenses based on geographic locations.

[c]This is not in the base IM; however, a financial aid officer can adjust for this on a case-by-case basis, consistent with professional judgment.

In addition, under the consensus approach schools agreed to a common calendar for collecting data from families. Members continue to maintain the ability to exercise professional judgment in assessing a family's ability to pay when there are unique or extenuating financial circumstances.

Twenty-five of 28 schools implemented the consensus approach; 3 did not. While 13 schools implemented all the elements of the consensus approach, the remaining schools varied in how they implemented the methodology. As shown in table 4 below, seven schools chose not to use the consensus approach method for accounting for family loan debt, home equity, and family and student assets.

Table 4: Number of Schools That Did Not Implement Certain Consensus Approach Options in School Year 2005-2006

Options in the consensus approach	Number of schools that did not implement option[a]
Number of siblings in college	1
One-time income adjustments	2
Elementary and secondary school tuition expenses	3
Medical expenses	3
Cost of living variances	5
Divorced and separated families	6
Family and student assets	7
Home equity	7
Family loan debt	7

Source: GAO analysis of schools' survey responses.

[a]A total of 25 member schools used part or all of the consensus approach.

The 25 schools that implemented the consensus approach did so between 2002 and 2005. Member schools reported that they preferred to use the consensus approach as opposed to other available need analysis methodologies because it was more consistent and fairer than alternative methodologies. Moreover, according to institution officials, they believed the new methodology had not reduced price competition and had resulted in the average student receiving more financial aid. In some cases, if using the consensus approach lowered a student's EFC, the institution would then allocate more money for financial aid than it would have if it had used a different need analysis methodology. For some schools the consensus approach was not that different from the methodology their institution already had in place, but other schools said that fully

implementing the consensus approach cost their school more money. Among schools that partially implemented the consensus approach, many explained they did not fully implement the new methodology because it would have been too costly.

As the Cost of Attendance at Schools Using the Exemption Rose, the Amount of Institutional Grant Aid They Provided to Students Increased at a Slower Rate

The cost to attend the schools participating under the exemption rose over the past 5 years by over 10 percent while cost increases at all other private schools rose at about half that rate. At the same time, the percentage of students receiving institutional aid increased and institutions increased the amount of such aid they provided students, although at a slower rate than cost increases.

Cost of Attendance Increased at Schools Using the Exemption Corresponding to Increases at Other Private Schools

During the past 5 years, the cost of attendance—tuition, fees, room, and board—at schools using the exemption increased by approximately 13 percent from $38,319 in school year 2000-2001 to $43,164 in school year 2004-2005, a faster rate than other schools.[11] For example, at other private 4-year schools there was a 7 percent increase in these costs, from $25,204 to $27,071.[12] Additionally, as figure 2 illustrates, among a set of schools that were comparable to the schools using the exemption, costs increased by 9 percent from $40,238 to $43,939 over that same time period.[13]

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[11]All dollar amounts are in 2005 dollars. Data presented for schools using the exemption was collected from 26 of the 28 schools using the exemption.

[12]Other private 4-year schools include not-for-profit institutions and do not include for-profit institutions. This set of schools includes schools that do not have need-blind admission policies and therefore would not be able to participate in activities allowed under the exemption.

[13]Comparable schools include the seven schools selected as control schools for our econometric analysis.

Figure 2: Average Tuition, Fees, and Room and Board at Schools Using the Antitrust Exemption Compared to All Other Private 4-Year Not-For-Profit Schools and Comparable Schools, School Years 2000 to 2005
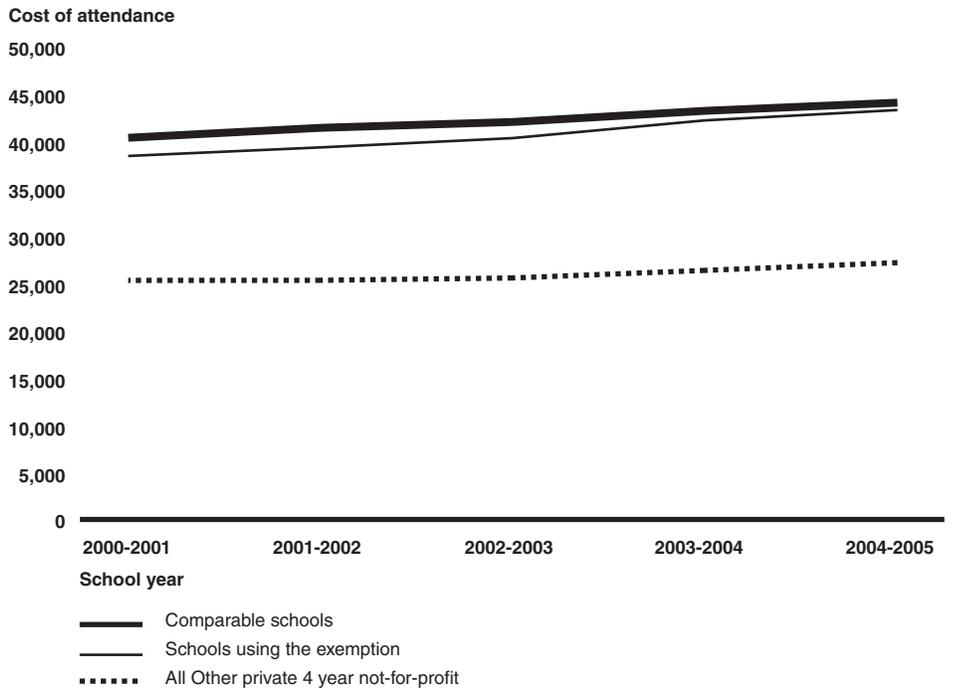
Source: GAO analysis of IPEDS data.

Note: Comparable schools include the seven schools selected as control schools for our econometric analysis.

Percentage of Students Receiving Institutional Grant Aid and the Amount Schools Provided Them Increased

Over the same time period, the percentage of students who received any form of institutional grant aid at schools using the exemption increased by 3 percentage points, from 37 to 40 percent, as illustrated by figure 3.

Figure 3: Percentage of Students at Schools Using the Antitrust Exemption Receiving Various Types of Institutional Grant Aid from 2000 to 2006
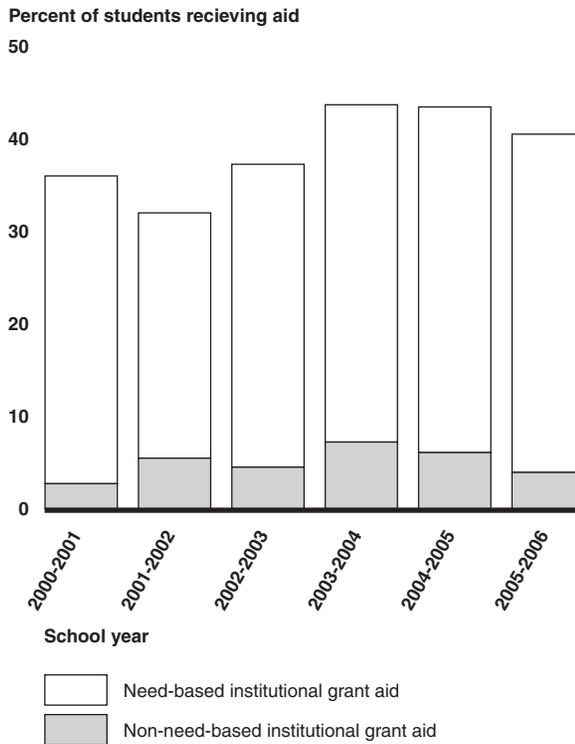
Percent of students recieving aid

School year

☐ Need-based institutional grant aid

▨ Non-need-based institutional grant aid

Source: GAO analysis of institutional data.

Note: Data collected from 26 of the 28 schools using the antitrust exemption.

Among students receiving institutional grant aid, the percentage of students receiving need-based grant aid increased from 34 to 36 percent from 2000 to 2006. The percentage of students receiving non-need-based grant aid also increased slightly, from 2 to 4 percent. Non-need-based aid is awarded based on a student's academic or athletic achievement and includes fellowships, stipends, or scholarships. The majority of schools using the exemption did not offer any non-need-based institutional grant aid in school year 2005-2006. However, in 2005-2006 some schools did, allocating non-need-based grant aid to between 16 to 54 percent of their students.

As the cost of attendance and percentage of students receiving institutional aid rose, participating institutions increased the amount of such aid they provided students, although the percentage increases in aid were smaller. As shown in figure 4, the average need-based grant aid

award across the schools using the exemption increased from $18,925 to $20,059, or 6 percent. The average amount of non-need-based grant aid awards dropped slightly from $12,760 in 2000-01 to $12,520 in 2005-06, or 2 percent. Overall, the average total institutional grant aid awarded to students, which included both need and non-need-based aid, increased from $18,675 in 2000-01 to $19,901 in 2005-06, or 7 percent.

Figure 4: Average Amount of Various Institutional Grant Aid Awards at Schools Using the Antitrust Exemption from 2000 to 2006
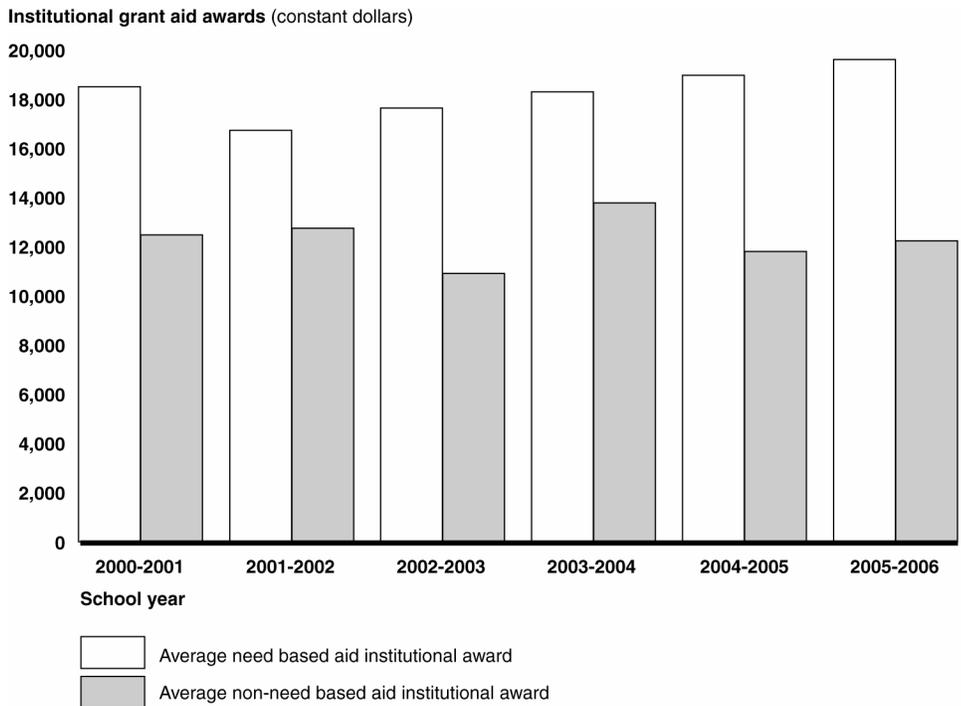
Source: GAO analysis of institutional data.

Note: Data collected from 26 of the 28 schools using the exemption.

Students Accepted to Both Schools Using the Exemption and Comparable Schools Had No Appreciable Difference in the Amount They Would Be Expected to Contribute Towards College

There was virtually no difference in the amounts students and their families were expected to pay between schools using the exemption and similar schools not using the exemption. Average EFC was $27,166 for students accepted at schools using the exemption, and $27,395 for those accepted at comparable schools not using the exemption in school year 2005-2006. Moreover, the variation in the EFC for a student who was accepted to several schools using the exemption was similar to the variation in EFC that same student received from schools not using the exemption. The variation in EFCs for these students was about $6,000 at both sets of schools.[14] Because the number of such students was small, we also analyzed variation in EFCs for students who were accepted only at schools using the exemption and compared it to the variation for students who were only accepted at comparable schools not using the exemption.[15] We found slightly greater variation among EFCs for students who were accepted at schools using the exemption; however, because we could not control for student characteristics, factors external to the exemption could explain this result, such as differences in a family's income or assets.

Although officials from schools using the exemption expected that students accepted at several of those schools would experience less variation in the amounts they were expected to pay, none of our analyses confirmed this. The lack of consistency in EFCs among schools using the exemption may be explained by the varied implementation of the consensus approach. As previously mentioned, not all schools using the consensus approach chose to adopt all the elements of the methodology. For example, seven schools chose not to use the consensus approach to home equity, which uses a percentage of the home equity in calculating the EFC. Using another method for assessing a family's home equity could significantly affect a student's EFC. For instance, we estimated that a family residing in Maryland with an income of $120,000 and $350,000 in home equity would have an EFC of $58,243 if a school chose not to implement the home equity option in the consensus approach. Under the consensus approach, the amount of home equity included in asset calculations would be capped and only $38,000 of the home's equity would be included in the calculation of EFC. The same family would then have an EFC of $42,449 if the school chose to implement the option.

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[14]Variation was measured by the standard deviation of the EFCs.

[15]For a more detailed discussion of our analysis see appendix I.

Implementation of a Common Methodology Has Not Significantly Affected Affordability or Enrollment at Schools Using the Exemption

Based on our econometric analysis, schools' use of the consensus approach did not have a significant impact on affordability, nor did it cause significant changes in the likelihood of student enrollment at schools using the consensus approach compared to schools that were not using the consensus approach.[16] As shown in table 5, while we found that the consensus approach resulted in higher need-based grant aid awards for some student groups (middle income, Asian students, and Hispanic students) compared to similar students at schools that were not using the consensus approach, this increase was likely offset by decreases in non-need-based grant aid, such as academic or athletic scholarships.[17] Thus, total grant aid awarded was not affected by the consensus approach because the increase in need-based aid was likely offset by decreases in non-need-based grant aid.[18]

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[16]GAO's econometric analysis was focused on the mandate from Congress that requires us to examine the effects of the exemption. It is different from a market-specific analysis conducted in an antitrust investigation, and is not intended to address whether or not conduct may be taking place that might violate the antitrust laws in the absence of the exemption.

[17]The results were similar for need-based institutional grant aid.

[18]The discussed effects of the consensus approach are statistically significant (i.e., different from zero) at the 5 percent significance level or less.

Table 5: Estimated Changes in Amount Paid, Financial Aid, and Enrollment at Schools Using the Consensus Approach Compared to Schools Not Using the Exemption

Student group	Estimated changes of using the consensus approach on:				
	Amount students paid	Total grant aid	Need-based total grant aid	Total aid (grant, loans, work-study)	Probability of enrollment
All students			$6,125[b]		
	$3,021	-$749	[$239, $12,011]	-$2,886	38%
Financial-aid applicants	2,177	n/a	n/a	n/a	22
Low-income				12,121[b]	
	-4,061	3,688	1,956	[1,837, 22,404]	59
Lower-middle income	8,089 [c]	-3,671	6,556	-7,776	95
Middle income			20,221[a]		
	2,320	1,618	[6,718, 33,724]	1,178	26
Upper-middle income	-1,048	-973	2,769	-3,054	18
High income	3,699	-714	4,687[c]	-3,856	31
Asian students			14,628[a]		
	-376	5,726	[5,051, 24,206]	3,694	1
Black students	4,468	-1,227	4,332	-6,542	-26
Hispanic students			9,532[b]		
	1,168	1,520	[1,006, 18,059]	3,648	108
White students			6,017[b]		
	2,588	-491	[178, 11,856]	-2,879	19

Source: GAO analysis (see table 16 in app. II).

[a]Result is statistically significant at the 1 percent level or lower.

[b]Result is statistically significant at the 5 percent level or lower.

[c]Result is statistically significant at the 10 percent level or lower.

Notes: The estimates in brackets are the confidence levels of the estimates that are significant at the 5 percent or lower level.

n/a means not applicable because of data limitations.

All the monetary values are in 2005 dollars.

Amount students paid is defined as tuition, room, board, fees, and other expenses minus grant aid.

Total grant aid includes both need- and non-need-based aid from federal, state, institutional and other sources.

Total aid includes grants, loans, and work-study aid from federal, state, institutional, and other sources.

The effect of the consensus approach on need-based institutional grant aid was $6,020, significant at the 5 percent level, with confidence interval between $512 and $11,528.

The value of the effect of the consensus approach on institutional grant aid was $1,331, but not statistically significant.

A different effect was found when low-income students at schools using the consensus approach were compared to their counterparts at schools not using the consensus approach. As shown in table 5, low income students at schools using the consensus approach received, on average, a significantly higher amount of total aid—about $12,121, which includes both grants and loans. However, the amount of grant aid that these students received did not significantly change, suggesting that that they likely received more aid in the form of loans, which would need to be repaid, or work-study. Our analysis of the effects of the consensus approach on various racial groups showed no effect on affordability for these groups compared to their counterparts at schools not using the consensus approach. While Asian, white, and Hispanic students received more need-based grant aid compared to their counterparts at schools not using the consensus approach, their overall grant aid awards did not change.

Finally, as shown in table 5, there were no statistically significant effects of the consensus approach on student enrollment compared to the enrollment of students at schools not using the consensus approach. In particular, the consensus approach did not significantly increase the likelihood of enrollment of low-income or minority students or any student group.

Our econometric analysis has some limitations that could have affected our findings.[19] For example, we could not include all the schools using the consensus approach in our analysis because there were no data available for some of them. However, there were enough similarities (in terms of "best college" ranking, endowment, tuition and fees, and percentage of tenured faculty) between the included and excluded participating schools that allowed for a meaningful analysis. (See table 6 for a list of schools included in our analysis).

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[19]For a more detailed discussion on our econometric models and the limitations of our analysis see appendix II.

Table 6: Schools Included in Analysis of Effects of Exemption

Schools using the consensus approach	Comparable schools not using the consensus approach
Cornell University	Brandeis University
Duke University	Bryn Mawr College
Georgetown University	New York University
University of Notre Dame	Princeton University
Vanderbilt University	Tulane University
Wake Forest University	University of Rochester
Yale University	Washington University at St. Louis

Source: GAO analysis.

Moreover, the data for our post-consensus approach period was collected in 2003-2004—the first or second year that some schools were using the consensus approach. Because we have data for only one year after implementation, it is possible that some eventual effects of the consensus approach may not be captured. The effects of using the consensus approach could be gradual, rather than immediate, and therefore may not be captured until later years.

Concluding Observations

By providing an exemption to antitrust laws enabling schools to collaborate on financial aid policies, the Congress hoped that schools would better target aid, making college more affordable for low income and other underrepresented groups. The exemption has not yet yielded these outcomes. Nor did our analysis find an increase in prices that some feared would result from increased collaboration among schools. Initial implementation of the approach has been varied; some schools have not fully implemented the need analysis methodology, and many schools are still in the initial years of implementation. As is often the case with new approaches, it may be too soon to fully assess the outcomes from this collaboration.

Agency Comments

We provided the group of schools using the antitrust exemption, the Secretary of Education, and the Attorney General with a copy of our draft report for review and comments. The group of schools using the exemption provided written comments, which appear in appendix IV. In general, the group stated that our study was a careful and objective report, but raised some concerns about the data used in our econometric analysis and the report's tone and premise. Specifically, they raised concerns about the selection of treatment and control schools for our econometric analysis. As we noted in the report, we selected schools for selection in treatment and control groups based, in part, on the availability of student-

level data in the NPSAS. Some schools that used the consensus approach were not included because there were no data available for them. However, we believe there were enough similarities between the included and excluded schools to allow for a meaningful analysis. The group also stated that a number of conclusions were based on a very small number of observations. In appendix II, we acknowledge the small sample size of the data could make the estimates less precise, especially for some of the subgroups of students we considered. However, we performed checks to ensure that our estimates were reliable and believe that we can draw conclusions from our analysis. With respect to the tone and premise of the report, the group raised concerns about using low income students as "a yardstick for judging the success of the Consensus Approach." When passing the exemption, Congress hoped that it would further the government's goal of promoting equal access to educational opportunities for students. Need-based grant aid is one way to make college more affordable for the neediest students to help them access a post-secondary education. The group also highlighted several positive outcomes from their collaboration, including a more transparent aid system and more engagement by college presidents in aid-related discussions, topics which our study was not designed to address. The group provided technical comments, which we incorporated where appropriate. Education reviewed the report and did not have any comments. The Department of Justice provided technical comments, which we incorporated where appropriate.

We are sending copies of this report to the Secretary of Education, Attorney General, appropriate congressional committees, and other interested parties. In addition, the report will be available at no charge on GAO's Web site at http://www.gao.gov.

If you or your staff have any questions please call me on (202) 512-7215. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Other contacts and staff acknowledgments are listed in appendix VI.

Cornelia M. Ashby, Director
Education, Workforce and
  Income Security Issues

List of Congressional Committees

The Honorable Arlen Specter
Chairman

The Honorable Patrick J. Leahy
Ranking Minority Member
Committee on the Judiciary
United States Senate

The Honorable F. James Sensenbrenner, Jr.
Chairman

The Honorable John Conyers, Jr.
Ranking Minority Member
Committee on the Judiciary
House of Representatives

Appendix I: Statistical Analysis of Expected Family Contributions at Schools Using the Exemption and Comparable Schools

We compared variation in expected family contributions (EFCs) between students who were admitted to both schools using the exemption and comparable schools that did not. We collected data on student EFCs from 27 of the 28 schools using the exemption and 55 schools that had similar selectivity and rankings as schools using the exemption. The data included the student's EFC calculated by the schools as of April 1, 2006, based on their need analysis methodology. We determined that these data would most likely reflect the school's first EFC determination for a student and thus would be best for comparison purposes. We then matched students across both sets of schools to identify students accepted to more than one school (which we call cross-admits).

Our sample consisted of data for the following three types of cross-admit students:

1. Students accepted to several schools using the exemption and several schools that were not (type 1 students);

2. Students accepted to only schools using the exemption (type 2 students); and

3. Students accepted to only schools not using the exemption (type 3 students).

Data from the type 1 sample provided the most suitable data for our analysis because it controlled for student characteristics. However, because this sample was relatively small, we used the other samples to supplement the analysis.

Once the cross-admits were identified, the EFCs for each student were used to evaluate the mean and median as measures of location and the standard deviation and range as measures of variation. Given the potential scale factor, the variation measures were standardized. The standard deviation was standardized by dividing it by the mean, and the range was standardized by dividing it by the median. The two resulting variation measures were the coefficient of variation (V1) and its robust counterpart (V2), respectively.

These two measures of variation were estimated for each and every student. The estimates were grouped for both sets of schools. We labeled schools using the exemption as "568 schools" and comparable schools that were not as "non-568 schools."

Table 7 reports various estimates averaged over students in each group. The table generally shows similar group averages for the mean, standard deviation, median, and range that were used to compute V1 and V2. The values reported are the averages for all the students in each group. There are fewer observations for the 568 schools than for the non-568 school, except for type 1 students where the number of observations were equal because the students were in both groups of colleges. In addition, we imposed the following three conditions:

- First, for the coefficient of variation V1, we excluded all observations where the standard deviations were zero. The zero standard deviations are excluded because some of the non-568 schools that use only the federal methodology to calculate EFCs report the same EFCs for a student and are likely to bias the results. None of the observations with zero standard deviations that we excluded involved a 568 school.

- Second, for the coefficient of variation V2, we excluded all observations where the medians were zero because we could not construct this measure that was obtained by dividing the range by the median.

- And, third, for the coefficient of variation V2, we excluded observations where the standardized variation exceeded 3 based on the observed distributions of the data.

The test results were similar when none of those conditions were imposed.

Table 7: Summary Statistics of Expected Family Contributions

Students	Schools using the exemption (568 schools)		Comparable schools (Non-568 schools)	
	Type 1 students	**All students**	**Type 1 students**	**All students**
Statistic				
Standard deviation	$6,188	$6,447	$6,190	$7,035
Mean	$27,166	$31,640	$27,395	$28,747
	[$22,576, $31,757]	[$30,380, $32,900]	[$22,293, $32,497]	[$27,924, $29,571]
Coefficient of variation 1 (V1)	0.27	0.24	0.36	0.35
Range	$12,200	$12,886	$9,671	$8,813
Median	$30,374	$31,677	$29,225	$31,075
	[$25,380, $35,367]	[$30,394, $32,961]	[$23,858, $34,593]	[$30,314, $31,836]
Coefficient of variation 2 (V2)	0.47	0.49	0.52	0.37
Number of students	N1=79	N1=1,158	N1=79	N1=2,866
	N2=76	N2=1,150	N2=76	N2=3,653

Source: GAO analysis.

Notes: Coefficient of variation 1 (V1) equals standard deviation divided by mean.

Coefficient of variation 2 (V2) equals range divided by median.

Type 1 consists of students with multiple offers from 568 colleges as well as offers from non-568 colleges. For the 568 colleges, all students consist of type 1 and type 2—students with multiple offers from only 568 colleges. And for the non568 colleges, all students consist of type 1 and type 3—students with multiple offers from only non-568 colleges.

The values in brackets are the 95 percent lower and upper bounds (confidence intervals).

N1 is the sample size for coefficient of variation 1 (V1) and N2 is sample size for coefficient of variation 2 (V2).

Denoting the estimates of V1 and V2 for the two groups by $\hat{V}1_{568}$ and $\hat{V}1_{non568}$, and $\hat{V}2_{568}$ and $\hat{V}2_{non568}$, the empirical distribution of $\hat{V}1_{568}$ was then compared with the empirical distribution of $\hat{V}1_{non568}$ to examine whether $\hat{V}1_{568}$ and $\hat{V}1_{non568}$ had identical distributions (that is EFCs for 568 schools were similar in variations to those for non-568 schools). A similar comparison was made using the robust measures $\hat{V}2_{568}$,

and $\hat{V}2_{non568}$.[1] To more closely examine the difference between the variations in EFCs of cross-admit students for 568 and non-568 schools, we performed the Kolmogorov-Smirnov test. The test examines whether the distributions of the variation measures $\hat{V}1_{568}$ and $\hat{V}1_{non568}$ were the same. The same analysis was done for the V2 measures. The test was reported for both samples, consisting of type 1 students and all students. The results reported in table 8 suggest that there was no difference in EFC variations across the two groups, using type 1 students. The results using all students, however, are inconclusive for the V1 estimate, but suggest that non-568 schools have smaller EFC variation for the V2 estimate. The results based on the type 1 sample are more useful as a stand-alone descriptive finding, because this sample controls for student characteristics. The finding based on the combined data requires further analysis to control for student characteristics that we were unable to perform due to data limitations.

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[1]We used the KSMIRNOV command in *Stata* to perform the tests.

Table 8: Tests of Variations in Expected Family Contributions

Variable	Student Data	Alternative hypothesis	Test-statistic, D	p-value	Conclusion
Coefficient of variation 1 (V1)	Type 1 N1=79 N2=79	Non-568 EFCs are smaller	0.1013	0.445	EFCs are similar
		Non-568 EFCs are larger	-0.1519	0.162	EFCs are similar
					Overall—EFCs are similar
Coefficient of variation 2 (V2)	Type 1 N1=76 N2=76	Non-568 EFCs are smaller	0.1447	0.203	EFCs are similar
		Non-568 EFCs are larger	-0.1053	0.431	EFCs are similar
					Overall—EFCs are similar
Coefficient of variation 1 (V1)	All N1=1,158 N2=2,866	Non-568 EFCs are smaller	0.1724	0.000	Non-568 EFCs are smaller
		Non-568 EFCs are larger	-0.1788	0.000	Non-568 EFCs are larger
					Overall—Inconclusive
Coefficient of variation 2 (V2)	All N1=1,150 N2=3,653	Non-568 EFCs are smaller	0.3970	0.000	Non-568 EFCs are smaller
		Non-568 EFCs are larger	-0.0399	0.061	EFCs are similar
					Overall—Non-568 EFCs are smaller

Source: GAO analysis.

Notes: Coefficient of variation 1 (V1) equals standard deviation divided by mean.

Coefficient of variation 2 (V2) equals range divided by median.

All means students with multiple offers from 568 schools as well as offers from non-568 schools (type 1), students with multiple offers from only 568 schools (type 2), and students with multiple offers from only non-568 schools (type 3).

The p-values are for the Kolmogorov-Smirnov tests of equality of distribution functions. All tests are interpreted using the 5 percent or lower level of significance.

N1 is the sample size for coefficient of variation 1 (V1) and N2 is sample size for coefficient of variation 2 (V2).

Appendix II: Econometric Analysis of Effects of the Higher Education Antitrust Exemption on College Affordability and Enrollment

To estimate the effects of schools' implementation of the consensus approach to need analysis on affordability (measured by price) and enrollment of freshmen students, we developed econometric models. This appendix provides information on theories of the exemption effects on student financial aid, the data sources for our analyses and selection of control schools, specifications of econometric models and estimation methodology, our econometric results, and limitations of our analysis.

Theories of the Effects of the Consensus Approach on Financial Aid

Two theories exist about the effects the consensus approach on student financial aid. It is important to note that the award of grant aid represents a discount from the nominal "list price", which lowers the price students actually pay for college. So, any decision to limit grant aid would be an agreement to limit discounts to the list price, and thus may raise the price some students would pay. It is also important to note that schools admit only a limited number of students. One of the theories suggests that allowing schools a limited degree of collaboration could reduce the variation in financial need determination for an individual student and reduce price competition among colleges vying for the same students. While the reduced competition would imply lower financial aid (hence higher prices) for some students, schools could thus devote more financial aid resources to providing access to other students, especially disadvantaged students. This "social benefit theory" assumes that under these conditions disadvantaged students would receive more grant aid and as a result, pay less for school. Also, an implicit assumption of this theory is that the exemption would essentially result in redistribution of financial aid without necessarily changing the amount of financial aid resources available. Moreover, because costs to students and their families would change for some students, enrollment of such students would be affected.

An opposing theory is that the exemption will allow schools to coordinate on prices and reduce competition. This "anti-competitive theory" essentially views coordination by the group as restraining competition. Specifically, under this theory, allowing an exemption would result in less grant aid and higher prices on average, especially for students that schools competed over by offering discounts on the list price. As a result, the amount of financial aid available to some students would likely decrease. If prices are higher on average, it could cause a decrease in enrollment, particularly of disadvantaged students since they would be less able to

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afford the higher prices.[1] Our analyses allowed us to test these two
theories with the data available.

Sources of Data for the Model

To construct our model, we used data from:

- National Postsecondary Student Aid Study (NPSAS): These data, available
  at the student-level, served as the primary source for our study because we
  were interested in student outcomes of the exemption. Data were
  published every 4 years during the period relevant to our study; hence, we
  have data for academic years 1995-1996, 1999-2000, and 2003-2004. The
  data contained student-level information for all freshmen enrollees in the
  database, including enrollment in school, cost of attendance, financial aid,
  Scholastic Aptitude Test (SAT) scores, household income, and race. The
  number of freshmen in the database for our study was 1,626 in 1995-1996,
  272 in 1999-2000, and 842 in 2003-2004.

- Integrated Postsecondary Education Data System (IPEDS): These data,
  available at the school level, included tuition and fees, faculty
  characteristics, and student enrollment for 1995-1996 and 2003-2004, there
  were no data published for 1999-2000. However, some of the data for 1999-
  2000 were reported in the subsequent publications. We were able to
  construct some data for 1999-2000 through linear interpolation of the data
  for 1998-1999 and 2000-2001 or using the data for either year depending on
  availability; we believed this was reasonable because data for these
  institutions did not vary much over time.[2]

- National Association of College and University Business Officers
  (NACUBO): This source provided data on school endowment from 1992
  through 2004.[3]

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[1]This theory is consistent with the idea that non-profit organizations have an incentive to
exercise market power despite not directly capturing profits, because the extra resources
from exercising market power allow them to invest in other areas they deem important;
e.g., schools may charge high prices to students because it could enable them to offer
higher salaries to attract high-caliber faculty.

[2]Student enrollment data was obtained through linear interpolation, and faculty data was
based on 1998-1999 data.

[3]Where necessary, the data were supplemented by data from IPEDS.

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- GAO Survey: The survey collected data on the activities of the schools using the higher education antitrust exemption, including when schools implemented the consensus approach methodology.

Selection of Control Schools

Determining the effects of the exemption required both a treatment group (schools using the exemption) and a control group (a comparable set of schools that did not use the exemption). To find a comparable set of schools we used data on school rankings based on their selectivity from years 1994 to 2004 from the *U.S. News and World Report (USNWR)*. We selected control schools similar to schools using the antitrust exemption that had comparable student selectivity and quality of education using the "best schools" rankings information in the *USNWR*.[4] The combined control and treatment schools were matched to school-level data from IPEDS, and student-level data from NPSAS. We selected the control schools based on their ranks in the years prior to the implementation of the consensus approach—1995-1996 and 1999-2000—and after the implementation of the consensus approach—2003-2004. The *USNWR* published its "best schools" rankings annually in August or September. Thus, the 2004 publication reflected the selectivity of the schools during 2003-2004. However, because publications in prior years—2002 and 2003—provided relevant information to students who enrolled in 2003-2004, we considered the rankings published from 2002 through 2004 as important input into decisions made by students and the schools for 2003-2004. Similarly, the publications from 1994 through 1996 were used to determine the selectivity of the schools in 1995-1996, and the publications from 1998 to 2000 were used to determine school selectivity for 1999-2000.

The *USNWR* published separate rankings for liberal arts schools and national universities. The schools using or affiliated with the exemption consisted of 28 current members, two former members, and six observers.[5] These 36 schools comprised the treatment schools used initially to select

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[4]Schools were ranked annually based on various criteria (including selectivity, faculty and financial resources, graduation rate, and alumni satisfaction) in various publications— particularly in the USNWR, the Peterson's Four-Year Schools, and the Barron's Profiles of American Schools. The rankings of the schools by the different publishers were generally similar, but since the data were readily available in the USNWR we chose its rankings. Using the published rankings helped avoid a possible bias from arbitrarily picking the schools. Furthermore, these rankings were widely used and generally stable over time.

[5]Although the observers were not members they attended the group's meetings. The former members were Bowdoin College and Macalester College.

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the comparable control schools. All 36 treatment schools were private; 13 were liberal arts schools and 23 were national universities.[6] To ensure there were enough control schools for the treatment schools, we initially selected all the schools ranked in tier 1 (and tier 2 when available) in the *USNWR* rankings for each of the two types of institutions—liberal arts schools and national universities.[7] This resulted in 250 schools, including all 36 treatment schools, for nine selected years (1994 to 1996, 1998 to 2000, and 2002 to 2004). All the treatment schools were ranked in each of the nine years (except for one school that was not ranked in 2002). The initial list of 250 schools was refined further to ensure a proper match in selectivity between the treatments and controls.

Although we were interested in obtaining an adequate number of control schools to match the treatment schools, we refined the selection process to ensure they were comparable using the following conditions. First, we limited the selection of all the schools (controls and treatments) to those that were ranked in tier 1. This reduced the sample of schools from 250 to 106 schools, comprising all 36 treatment schools and 70 control schools. Second, the list of 106 schools was used to match school-level data from the IPEDS in each of the three academic years.[8] Third, these data were then matched with the IPEDS data for each of the three academic years to student-level data from NPSAS. From the NPSAS, we selected data for cohorts who entered their freshmen year in each of the three academic years.[9] Fourth, since we used a difference-in-difference methodology for the analysis, we wanted data for each school in at least two of the three academic years—one in the pre-treatment and one in the post-treatment period. We therefore initially constructed four samples of schools, depending on whether there were matches between all three academic years, or between any two of the three academic years. This resulted in 30 schools with data in all three academic years 1995-1996, 1999-2000, and

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[6]Liberal arts schools emphasize undergraduate education and award at least half of their degrees in the liberal arts discipline, and most are private. National universities offer a wide range of undergraduate majors as well as master's and doctoral degrees, and many emphasize research.

[7]The number of schools in the two tiers for each type of school was between 50 and 90 for each year.

[8]We also used endowment data from NACUBO, and school-level data from GAO's survey of the schools.

[9]We used data for students who were enrolled as freshmen, as of October of the academic year, in the NPSAS database.

2003-2004 (referred to as sample 1). There were 34 schools with data in 1995-1996 and 2003-2004 (sample 2); 35 schools with data in 1999-2000 and 2003-2004 (sample 3); and 37 schools matched between 1995-1996 and 1999-2000 (sample 4).[10] Finally, we limited the selection to private schools because all of the treatment schools are private. We did this because the governance of private schools generally differed from state-controlled public schools and these differences were likely to affect affordability and enrollment at a school.

Determination of the Appropriate Time Periods for Assessing Effects and Classification of Schools that Only Attended the Meetings

We also determined the academic year(s) data that would be used to represent the period before and the period after the implementation of the consensus approach. Since we had data for only 1995-1996, 1999-2000 and 2003-2004, and given that the consensus approach was implemented in 2003-2004 (or in the prior year by some schools) we selected 1995-1996 as the pre-consensus approach period and 2003-2004 as the post-consensus approach period. Although the 1999-2000 data were relatively current for the pre-consensus approach period, it is possible that the 1999-2000 data may offer neither strong pre- nor post-consensus approach information since the period was very close to the formation of the 568 President's Group in 1998. Furthermore, the institutional methodology, which is a foundation for the consensus approach and used by some of the control schools in 2003-2004, was revised in 1999. We therefore investigated whether it was appropriate to include 1999-2000 in the pre-consensus approach period or in the post-consensus approach period. We also investigated in which group (control or treatment) the schools that only attended the 568 President's Group meetings, but had not become members of the group or implemented the consensus approach, belonged.

Using the Chow test for pooling data, we determined that 1999-2000 should be excluded from the pre-consensus approach period as well as from the post-consensus approach period. We also determined that schools that only attended the 568 President's Group meetings could not be regarded as control schools or treatment schools in analyzing the effects of the consensus approach.[11] Therefore, the treatment schools

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[10]Although the sample periods used by Hoxby (2000) and Netz (2000) are much earlier than what we used, our list of schools is reasonably consistent with theirs. Similarly, our list of schools was consistent with the schools in the Consortium for Financing Higher Education (COFHE), which are some of the most selective private schools in the U.S.

[11]See appendix III for details of the tests.

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consisted of the group members that implemented the consensus approach, and the control schools consisted of the schools that were not members of the 568 Group and did not attend their meetings. Based on the analysis above, we used the data in sample 2, which excluded data collected in 1999-2000, for our baseline model analysis; the period before the consensus approach is 1995-1996 and the period after is 2003-2004; the control schools that did not use the consensus approach (non-CA schools) are Brandeis University, Bryn Mawr College, New York University, Princeton University, Tulane University, University of Rochester, and Washington University at St. Louis, and the treatment schools that used the consensus approach (CA schools) are Cornell University, Duke University, Georgetown University, University of Notre Dame, Vanderbilt University, Wake Forest University, and Yale University. The complete list of the schools is in table 9.

Table 9: Control and Treatment Schools for Analyzing Effects of the Consensus Approach Implementation

Academic years	Control school (Non-CA)	Treatment school (CA)
1995-1996 1999-2000 & 2003-2004	Sample 1: Brandeis University New York University Princeton University[b] Tufts University[a,b] Tulane University University of Rochester Washington University at St. Louis	Samples 1, 2, or 3: Boston College[a] Cornell University[b] Duke University Georgetown University Massachusetts Institute of Technology[a,b] University of Notre Dame University of Pennsylvania[a,b] Vanderbilt University Wake Forest University Yale University[b]
1995-1996 & 2003-2004	Sample 2—All of Sample 1 Plus: Bryn Mawr College[b] Yeshiva University[a]	
1999-2000 & 2003-2004	Sample 3—All of Sample 1 Plus: Colgate University Lehigh University Whitman College	
1995-1996 & 1999-2000	Sample 4—All of Sample 1 Plus: Carnegie Mellon University Johns Hopkins University	Sample 4—All of Above Plus: Columbia University[b]

Source: GAO analysis.

[a]Schools were excluded because there were no data for SAT scores for 2003-2004.

[b]Member of the former Overlap group.

[c]Members of the 568 Group that had not implemented the consensus approach.

[d]Were not members of the 568 Group but attended meetings.

[e]Former member of the 568 Group.

Notes: Schools that Only Attended 568 Group Meetings: Sample 2: Stanford University[d], University of Southern California[a,d] and Sample 4: Case Western Reserve University[e].

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Member schools that had not implemented the consensus approach: Sample 2: Brown University,[b,c] Sample 3: Dartmouth College[b,c].

Other 568-Affiliated Schools: Amherst College,[b] Bowdoin College,[b,e] California Institute of Technology,[d] Claremont McKenna College, Davidson College, Emory University, Grinnell College, Harvard University,[b,d] Haverford College, Macalester College,[e] Middlebury College,[b] Northwestern University, Pomona College, Rice University, Swarthmore College, Syracuse University,[d] University of Chicago, Wellesley College,[b] Wesleyan University,[b] Williams College[b]

Specifications of Econometric Models and Estimation Methodology

We developed models for analyzing the effects of the implementation of the consensus approach (CA) on affordability and enrollment of incoming freshman using the consensus approach.[12] We used a difference-in-difference approach to identify the effects of implementation of the consensus approach. This approach controlled for two potential sources of changes in school practices that were independent of the consensus approach. First, this approach enabled us to control for variation in the actions of schools over time that were independent of the consensus approach. Having control schools that never implemented the consensus approach allowed us to isolate the effects of the exemption and permitted us to estimate changes over time that were independent of the consensus approach implementation. Second, while we had a control group of schools that did not use the consensus approach, but were otherwise very similar to treatment schools, it is possible that schools using the consensus approach differed in ways that would make them more likely to implement practices that are different from those of other schools.[13] The difference-in-difference approach controlled for this possibility by including data on schools using the consensus approach both before and after its adoption. Controlling then for time effects independent of the consensus approach as well as practices by these schools before adoption, the effect of the use of the consensus approach could be estimated.

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[12] We did not separate the effects of the CA into the effects of only attending the 568 Group meetings and the effects of only implementing the CA, although some schools only attended meetings and had not implemented the CA, because in table 9 there are only three schools in sample 2 that would serve as treatments or serve as controls if we investigate the effects of only attending meetings or the effects of only implementing the CA, respectively.

[13] In addition to having the control schools, we also controlled for a number of school characteristics that are discussed below. It is only the possibility of changes in differences between treatment and control schools that were not measurable or not observable that might lead to bias in estimating the effects of the consensus approach implementation. For example, schools adopting the consensus approach might differ in their objectives concerning their preferred student body. As discussed next in the text, the difference-in-difference approach provided controls for such possibilities.

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Compared to the schools that did not use the consensus approach, we expected that the implementation of the consensus approach would have a significantly greater impact on the schools using the consensus approach because its use has potential implications for affordability and enrollment of students in these schools.

Modeling the Effects of the Consensus Approach Methodology for Financial Need on Affordability and Enrollment

The basic tenets of financial need analysis are that parents and students should contribute to the student's education according to their ability to pay. The CA schools used the consensus approach for its need analysis methodology and to determine the expected family contribution (EFC) for each student based on that methodology. Conversely, the non-CA schools primarily used a need analysis methodology called the institutional methodology (IM). The difference between the cost of attendance (COA) and the EFC determines whether a student has financial need. If so, the school then develops a financial aid package of grants, loans, and work study from various sources. The actual amount that students and families pay depends on how much of the aid received is grant aid. Therefore, the implementation of the consensus approach was expected to affect the price paid and the financial aid received by students, and by implication, their enrollment into schools.

Dependent variables:

The study examined the effects of the implementation of the consensus approach on two key variables: affordability (measured by price) and enrollment of freshman. We also estimated other equations to provide further insights on affordability— tuition, total grant aid, need-based grant aid, and total aid. All the dependent variables were measured at the student level, except tuition. Also, all monetary values were adjusted for inflation using the consumer price index (CPI) in 2005 prices.[14] The dependent variables were defined as follows:

- Price ($PRICE_{ijt}$): Price, in dollars, actually paid by freshman i who enrolled in school j in an academic year t. The variable was measured as the cost of attendance less total grant aid. The cost of attendance consisted of tuition

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[14]All the dependent variables were from NPSAS, except tuition, which was from IPEDS. We used the general price level instead of the price index for higher education to adjust the monetary values because the former better reflected potential substitution effects between college education and other expenditures by households. Furthermore, sector-specific price indexes generally tend to be more volatile.

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and fees, on-campus room and board, books and supplies, and other expenses such as transportation. Total grant aid consisted of institutional and non-institutional grant aid; it excluded self-help aid (loans and work study).

The other dependent variables that we estimated to help provide more insights into the results for affordability were:

- Tuition ($TUITION_{ijt}$): The amount of tuition and fees in dollars charged by school j to freshman i who enrolled in an academic year t.[15]

- Total grant aid ($AIDTGRT_{ijt}$): The amount of total grant aid received, in dollars, by a freshman i who enrolled in school j in an academic year t. The counterpart to grant aid was self-help aid.[16]

- Need-based grant aid ($AIDNDTGRT_{ijt}$): The amount of need-based grant aid received, in dollars, by freshman i who enrolled in school j in an academic year t. The counterpart to need-based aid was non-need-based aid, which consisted mainly of merit aid.[17]

- Total aid package ($AIDTOTAMT_{ijt}$): The amount of total aid received, in dollars, by freshman i who enrolled in school j in an academic year t. The total aid consisted of total grants (from the school, the various levels of government—federal, state—and other sources) and self-help (includes loans and work-study).

- Student enrollment ($ENRCA_{ijt}$): An indicator variable for student enrollment into a CA school ($ENRCA_{ijt}$). It equals one if a freshman i enrolled in an academic year t in school j that was a school using or later the consensus approach, and zero otherwise. Thus, at t=0 (1995-1996), a school was designated as a CA school if it implemented the consensus approach in period t=1 (2003-2004). Students who enrolled in a non-CA school were assigned a value of zero. In other words, ENRCA takes a value of one for every student enrolled in a CA school in any time period (1995-1996 or 2003-2004), and zero otherwise.

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[15]The tuition amount was the same for all freshmen in a private school.

[16]We also estimated an equation for institutional grant aid (*AIDINSTGRT*) and self-help aid (*AIDSELFPLUS*).

[17]We also estimated an equation for need-based institutional aid (*AIDNDINST)* and non-need-based grant aid (*AIDNONDTGRT*), which was the difference between total grant aid and need-based aid. However, we did not have enough data to estimate merit-only aid.

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Explanatory variables:

Several variables could potentially affect each of the dependent variables identified above. The explanatory variables we used were based on economic reasoning, previous studies, and data availability.[18] All the equations used were in quasi reduced-form specifications. The key explanatory variable of interest was the exercise of the exemption through the implementation of the consensus approach by the 568 Group of schools. We were also interested in the effects of the implementation of the consensus approach on affordability and enrollment of disadvantaged students. In order to isolate the relationships between the consensus approach implementation and each of the dependent variables, we controlled for the potential effects of other explanatory variables. The following is a complete list of all the explanatory variables we used:

- Exemption indicator: $EMCA_{jt}$[19]
  The exemption was captured by the implementation of the consensus approach by a school.[20] EMCA equals one if school j has implemented CA by academic year t, where t is 2003-2004 and zero otherwise.

  We used other explanatory variables in our equations, in addition to the exemption indicator for the implementation of the consensus approach. These variables included school-level characteristics, school specific fixed-effects, time specific fixed-effects, and student-level characteristics.

- School-level characteristics:[21]
  The school variables or attributes varied across the schools *(j)* and over time *(t)*, but did not vary across the students *(i)*. The school characteristics may capture the quality of the schools, expenditures by the schools that may compete with financial aid for funding, revenue sources

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[18]We relied on several previous studies, including Avery and Hoxby (2003), Carlton et al. (1995), Bamberger and Carlton (1993), Epple et al. (2005), Hill et al. (2005), Hoxby (2000), Kim (2005), Netz (1999, 2000), Hill and Winston (2001), Morrison (1992), Salop and White (1991), Shepherd (1995), and Winston and Hill (2005).

[19]This variable was from the GAO survey of the CA and non-CA schools.

[20]The CA schools are the 568 schools that have either implemented the consensus approach fully or in part by implementing some of the options under that need analysis methodology for financial aid. Of the seven CA schools in sample 2 in table 9, only three had not fully implemented the consensus approach (Georgetown, Vanderbilt, and Wake Forest).

[21]All the school-level variables are from IPEDS.

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for financial aid, or the preferences of the students.[22] The variables used
were:

- ENDOWSTU$_{jt}$: The interaction between the 3-year average endowment
  per student and the 3-year average percentage rate of return on
  endowment per student at school j for an academic year t. The
  inclusion of the rate of returns from endowments helped minimize the
  possibility that developments in financial markets could bias the
  results especially if the average endowment per student differed across
  the two groups of schools.

- RANKAVG$_{jt}$: The average "best schools" rank of school j for an
  academic year t. Although we used this variable to select the control
  schools that were comparable in selectivity to the treatment schools
  before matching the data to the NPSAS data, this variable was
  included, due to data limitations, to control for the possibility that the
  two groups of schools used in the sample may differ in selectivity.

- ENROLUG$_{jt}$: The 3-year average growth rate (in decimals) of
  undergraduate enrollment at school j for an academic year t.

- TENURED$_{jt}$: The percentage (in decimals) of total faculty at school j
  that was tenured in an academic year t.

- Time specific fixed-effects:
  These variables captured differences over time that did not vary across the
  schools, such as increases in national income that could increase
  affordability of schools. This was an indicator variable for the academic
  years (time):

  AY1995$_t$: Equals one for the academic year 1995-1996, and zero otherwise
  AY2003$_t$: Equals one for the academic year 2003-2004, and zero otherwise.

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[22]The school specific fixed-effects were estimated using the fixed-effects estimator, where
feasible. This effect captured differences among the schools that did not vary over time,
such as location, memberships in athletic conferences and other organizations such as the
former Overlap group. Also, several school-level variables could not be used in the models
because the variables did not vary over time, and were therefore expected to be captured
by the school specific fixed-effects.

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- Student characteristics:[23]

  All the student-level variables or attributes generally varied across
  students (i), across schools (j), and across time (t). The student
  characteristics indicated the preferences of the students for a school as
  well as the decisions of the schools regarding the students they admitted.
  The variables used were:

  - $FINAID_{ijt}$: Equals one if a freshman i who enrolled in school j in an
    academic year t applied for financial aid, and zero otherwise.

  - RACE: Equals one if a freshman i who enrolled in school j in an
    academic year t is:

    Asian—$ASIAN_{ijt}$, and zero otherwise.
    Black—$BLACK_{ijt}$, and zero otherwise.
    Hispanic—$HISPANIC_{ijt}$, and zero otherwise.
    White—$WHITE_{ijt}$, and zero otherwise.
    Foreigner—$FOREIGN_{ijt}$, and zero otherwise.
    None of the above—$OTHER_{ijt}$, and zero otherwise.[24]

  - INCOME: Equals one for a freshman i who enrolled in school j in an
    academic year t has household income in the following quintiles:

    $INCLO_{ijt}$: Below or equal to the 20th percentile, and zero otherwise.
    These were low-income students, and the median income for the group
    was $13,731 in 2005 dollars.

    $INCLOMD_{ijt}$: Above the 20th and below or equal to the 40th percentile,
    and zero otherwise. These were lower-middle income students, and the
    median income for the group was $40,498 in 2005 dollars.

    $INCMD_{ijt}$: Above the 40th and below or equal to the 60th percentile, and
    zero otherwise. These were middle-income students, and the median
    income for the group was $59,739 in 2005 dollars.

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[23]All the student-level variables were from NPSAS.

[24]We included Native Americans in *OTHER* because of their relatively small numbers.

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INCUPMD$_{ijt}$: Above the 60th and below or equal to the 80th percentile, and zero otherwise. These were upper-middle income students, and the median income for the group was $88,090 in 2005 dollars.

INCHI$_{ijt}$: Above the 80th percentile, and zero otherwise. These were high-income students, and the median income for the group was $145,912 in 2005 dollars.

Since we included minority students (Asian, black, and Hispanic students) as well as lower income groups (low income and lower-middle income students) to measure needy students, the minority variables likely captured nonincome effects.[25]

EFC$_{ijt}$: Expected family contribution for a freshman i who enrolled in school j in an academic year t. Although this variable captured the income of the students, it also reflected other factors that affect financial aid, such as the number of siblings in college.[26]

SCORESAT$_{ijt}$: The combined scholastic aptitude test (SAT) scores for math and verbal of freshman i who enrolled in school j in an academic year t.

Tables 10 and 11 show summary statistics for the variables listed above for treatment and control schools in sample 2 (as listed in table 9).[27] In general, the values of the variables were similar between the two groups of schools.

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[25]To avoid the dummy-variable trap in the estimation, we excluded white students from the racial groups, and high-income students from the income groups.

[26]The *EFC* is the federal calculation, which differs significantly from the *EFC* calculated by the CA schools, and to some extent from the *EFC* calculated by the non-CA schools. We found a negative relationship between the number of siblings and *EFC* using the limited data on siblings, although the link was not strong.

[27]The reported values are probability-weighted.

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Table 10: Summary Statistics of Variables Used in Regression Analysis, 1995-1996 and 2003-2004: CA Schools

Variable	Mean	Std	Min	Max
School-level				
TUITION	$26,245	$3,557	$18,910	$31,152
ENDOWSTU	$227,213	$230,768	$44,061	$1,146,129
RANKAVG	16	9	2	27
ENROLUG	2%	6%	-1%	21%
TENURED	56%	13%	25%	75%
Student-level				
PRICE	$30,792	$11,144	$1,065	$52,354
AIDTGRT	$7,133	$9,866	$0	$40,658
AIDNDTGRT	$5,526	$8,722	$0	$35,321
AIDNONDTGRT	$1,607	$4,360	$0	$30,403
AIDTOTAMT	$12,465	$13,566	$0	$43,195
AIDSELFPLUS	$4,794	$8,155	$0	$36,730
EFC	$24,486	$22,268	$0	$115,090
SCORESAT	1301	144	790	1600
FINAID	76%	n/a	n/a	n/a
ASIAN	9%	n/a	n/a	n/a
BLACK	5%	n/a	n/a	n/a
HISPANIC	7%	n/a	n/a	n/a
FOREIGN	2%	n/a	n/a	n/a
OTHER	5%	n/a	n/a	n/a
WHITE	71%	n/a	n/a	n/a
INCLO	5%	n/a	n/a	n/a
INCLOMD	11%	n/a	n/a	n/a
INCMD	13%	n/a	n/a	n/a
INCUPMD	17%	n/a	n/a	n/a
INCHI	54%	n/a	n/a	n/a
Schools	Cornell University, Duke University, Georgetown University, University of Notre Dame, Vanderbilt University, Wake Forest University, Yale University			
Number of observations				241

Source: GAO analysis.

Note: All values are (probability) weighted averages, and the monetary values are in 2005 dollars.

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Table 11: Summary Statistics of Variables Used in Regression Analysis, 1995-1996 and 2003-2004: Non-CA Schools

Variable	Mean	Std	Min	Max
School-level				
TUITION	$27,031	$2,259	$24,571	$31,714
ENDOWSTU	$256,147	$329,513	$27,909	$1,504,930
RANKAVG	23	12	1	43
ENROLUG	1%	1%	-2%	4%
TENURED	56%	12%	26%	72%
Student-level				
PRICE	$28,815	$10,305	$4,569	$50,726
AIDTGRT	$10,869	$9,792	$0	$32,803
AIDNDTGRT	$8,573	$9,132	$0	$31,487
AIDNDTGRT	$2,296	$5,419	$0	$27,919
AIDTOTAMT	$16,487	$13,875	$0	$48,572
AIDSELFPLUS	$5,293	$7,686	$0	$48,041
EFC	$21,717	$21,724	$0	$105,095
SCORESAT	1268	151	740	1590
FINAID	80%	n/a	n/a	n/a
ASIAN	12%	n/a	n/a	n/a
BLACK	5%	n/a	n/a	n/a
HISPANIC	4%	n/a	n/a	n/a
FOREIGN	3%	n/a	n/a	n/a
OTHER	3%	n/a	n/a	n/a
WHITE	74%	n/a	n/a	n/a
INCLO	10%	n/a	n/a	n/a
INCLOMD	9%	n/a	n/a	n/a
INCMD	12%	n/a	n/a	n/a
INCUPMD	21%	n/a	n/a	n/a
INCHI	48%	n/a	n/a	n/a
Schools	Brandeis University, Bryn Mawr College, New York University, Princeton University, Tulane University, University of Rochester, Washington University at St. Louis			
Number of Observations				277

Source: GAO analysis.

Note: All values are (probability) weighted averages, and the monetary values are in 2005 dollars.

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Comparison of Prices and Financial Aid in CA and Non-CA Schools

Table 12 shows summary statistics on price and financial aid before and after the implementation of the consensus approach in 2003-04 at the CA and non-CA schools in sample 2. Similarly, table 13 shows the summary statistics by income and racial groups.[28] It is important to note that the summary information on the observed differences before and after the implementation of the consensus approach for the CA and non-CA schools are heuristic and do not conclusively determine the potential effects of the implementation of the consensus approach. It is also important to note that, for any given variable, it is possible that there are other factors than implementing the consensus approach that are responsible for the observed differences, including differences between CA and non-CA schools' student populations or differences in the characteristics of the schools, or both. For instance, the price paid by middle-income students increased more in CA than in non-CA schools. While this may reflect the effect of consensus approach, it is possible that other factors are responsible for the differences. For example, the racial composition of middle-income students might also be different between the two groups, or there may be systematic differences in endowment growth between the CA and non-CA schools that affect financial aid to middle-income students. Thus, to assess the effect of consensus approach, it is necessary to study the effects of consensus approach while controlling simultaneously for all factors that influence price and aid policies.

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[28]The reported values are probability-weighted.

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Table 12: CA and Non-CA Schools: Price and Financial Aid

All students	CA Schools			Non-CA Schools		
	1995-1996	2003-2004	Percentage difference	1995-1996	2003-2004	Percentage difference
Price[a]	$28,039	$35,488	27%	$28,068	$30,838	10%
Tuition & fees	24,062	29,967	25	25,770	30,447	18
Total observations	**150**	**91**		**198**	**79**	
Financial-Aid Applicants Only						
Student Applied for Financial Aid						
Price[a]	$25,845	$32,897	27%	$24,960	$29,705	19%
Total grant aid	9,142	9,775	7	13,391	13,960	4
Need-based total grant	7,771	6,439	-17	11,863	8,122	-32
Institutional grant aid	7,073	6,529	-8	11,297	11,116	-2
Total aid	16,604	16,046	-3	19,827	22,255	12
Loans (incl. PLUS)	5,954	4,849	-19	5,271	6,669	27
Work study	710	866	22	986	715	-27
Number of observations	112	72		152	73	
Student Did Not Apply for Financial Aid[b]						
Price[a]	34,645	44,504	28	37,714	44,292	17
Number of observations	38	19		46	6	
Total observations	**150**	**91**		**198**	**79**	

Source: GAO analysis.

[a]Price equals cost of attendance less total grant aid. Cost of attendance equals tuition and fees, plus expenses (including room and board, and books).

[b]Financial aid data were not available for students who did not apply for financial aid.

Notes: All values are (probability) weighted averages, and the monetary values are in 2005 dollars.

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Table 13: CA and Non-CA Schools—Financial Aid Applicants Only: Price and Financial Aid

	CA schools				Non-CA schools		
	1995-1996	2003-2004	Percentage difference		1995-1996	2003-2004	Percentage difference
Income level							
Low income							
Price[a]	$12,566	$10,095	-20		$18,950	$21,886	15
Total grant aid	$23,429	$27,020	15		$19,093	$21,861	14
Need-based total grant	$21,422	$21,191	-1		$16,849	$17,756	5
Institutional grant aid	$17,278	$12,597	-27		$14,060	$17,447	24
Total aid	$27,385	$35,956	31		$24,772	$26,523	7
Number of observations	9	3			26	8	
Lower-middle income							
Price[a]	$17,613	$30,437	73		$17,623	$20,546	17
Total grant aid	$17,531	$14,793	-16		$20,598	$23,014	12
Need-based total grant	$15,762	$12,949	-18		$20,417	$15,456	-24
Institutional grant aid	$11,735	$9,667	-18		$15,742	$19,386	23
Total aid	$24,025	$18,409	-23		$28,462	$30,509	7
Number of observations	13	12			22	5	
Middle income							
Price[a]	$22,146	$30,156	36		$21,240	$25,279	19
Total grant aid	$12,277	$12,076	-2		$17,173	$17,336	1
Need-based total grant	$8,293	$10,767	30		$16,053	$9,048	-44
Institutional grant aid	$11,096	$9,936	-10		$16,000	$13,854	-13
Total aid	$18,811	$20,743	10		$24,261	$25,176	4
Number of observations	16	10			20	12	
Upper-middle income							
Price[a]	$23,759	$31,631	33		$26,905	$29,524	10
Total grant aid	$10,410	$10,374	-0.3		$12,030	$13,478	12
Need-based total grant	$9,732	$5,864	-40		$10,289	$6,593	-36
Institutional grant aid	$8,694	$7,719	-11		$10,900	$7,198	-34
Total aid	$16,926	$19,277	14		$19,425	$20,769	7
Number of observations	21	13			32	11	

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	CA schools				Non-CA schools		
	1995-1996	**2003-2004**	**Percentage difference**		**1995-1996**	**2003-2004**	**Percentage difference**
High income							
Price[a]	$31,776	$37,127	17		$30,184	$33,806	12
Total grant aid	$3,493	$5,468	57		$7,941	$10,331	30
Need-based total grant	$2,810	$1,694	-40		$6,185	$5,377	-13
Institutional grant aid	$2,532	$3,430	35		$7,062	$8,884	26
Total aid	$12,393	$10,850	-12		$13,300	$19,797	49
Number of observations	53	34			52	37	
Total observations	**112**	**72**			**152**	**73**	
Race[b]							
Asian							
Price[a]	$28,082	$28,756	2		$25,642	$27,624	8
Total grant aid	$8,371	$16,265	94		$10,827	$17,834	65
Need-based total grant	$7,675	$13,129	71		$9,900	$14,646	48
Institutional grant aid	$6,906	$11,607	68		$7,771	$13,376	72
Total aid	$14,343	$23,037	61		$15,513	$27,425	77
Number of observations	11	5			23	13	
Black							
Price[a]	$12,702	$22,935	81		$13,530	$17,375	28
Total grant aid	$21,360	$19,958	-7		$23,296	$25,010	7
Need-based total grant	$19,836	$8,932	-55		$18,517	$15,631	-16
Institutional grant aid	$15,046	$17,404	16		$18,582	$21,231	14
Total aid	$29,572	$24,950	-16		$29,121	$26,707	-8
Number of observations	10	3			8	4	
Hispanic							
Price[a]	$21,177	$21,529	2		$20,282	$16,694	-18
Total grant aid	$15,432	$18,586	20		$17,028	$25,993	53
Need-based total grant	$13,514	$13567	0.4		$14,684	$18,611	27
Institutional grant aid	$11,960	$13,813	15		$13,187	$17,998	36
Total aid	$20,110	$25,576	27		$22,446	$32,732	46
Number of observations	7	8			11	2	

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	CA schools			Non-CA schools		
	1995-1996	**2003-2004**	**Percentage difference**	**1995-1996**	**2003-2004**	**Percentage difference**
White						
Price[a]	$27,832	$35,099	26	$25,736	$30,952	20
Total grant aid	$6,711	$7,382	10	$13,028	$12,512	-4
Need-based total grant	$5,271	$4,284	-19	$11,645	$6,249	-46
Institutional grant aid	$5,105	$4,240	-17	$11,378	$10,187	-10
Total aid	$14,635	$14,130	-3	$20,042	$21,005	5
Number of observations	81	48		103	49	
Total observations	**112**	**72**		**152**	**73**	

Source: GAO analysis.

[a]Price equals cost of attendance less total grant aid. Cost of attendance equals tuition and fees, plus expenses (including room and board, and books).

[b]Data for other race, including Native American, unidentified race, and foreign students were too few to report.

Notes: All values are (probability) weighted averages, and the monetary values are in 2005 dollars.

Model Specifications and Estimation Methodology

Our econometric analysis is based on panel data, which pooled cross-sectional and time series data. The cross-sectional data were based on freshmen who enrolled in CA schools and non-CA schools, and the time series data were for academic years 1995-1996 and 2003-2004. Where feasible, we used panel-data estimation appropriate for cross-sectional and time series data. Also, we used fixed-effects estimation instead of random-effects estimation because the observations were not randomly chosen and there were likely to be unobserved school-specific effects.[29] The reported estimates were based on the fixed-effects estimators, using probability weights, and the standard errors were robust.[30]

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[29]The panel data were unbalanced because there were different observations on the freshmen for each school in each academic year. An important purpose in combining cross-sectional and time series data was to control for individual school-specific unobservable effects, which may be correlated with the covariates in the models. An advantage of using the fixed-effects estimator was that there was no need to assume that the unobserved school-specific effects were independent of the covariates. However, unlike the random-effects estimator, the fixed-effects estimator did not allow the inclusion of time-invariant variables, such as the former Overlap group and membership in sports associations, as covariates.

[30]The weights are the probability weights from the number of students in the sample for each school, and the robust estimates of the standard errors are based on the Huber/White sandwich estimator. All estimates were obtained using *Stata*.

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Price, Tuition, and Financial Aid Equations:

Let Y_{ijt} be the dependent variable for freshman i's outcomes at the chosen school j in academic year t, where the main outcome variable studied is affordability represented by price ($PRICE_{ijt}$).[31] The regression equations were specified generally as follows:

$$
Y_{ijt} = \alpha + \sum_{t=2}^{T} \psi_t + \sum_{j=2}^{J} \theta_j + I_{jt}\beta + S_{ijt}\rho + EMCA_{jt}\delta + EMCA_{jt}\,I_{jt}\,\eta \\
+ EMCA_{jt}\,S_{ijt}\,\gamma + \varepsilon_{ijt}
\tag{1}
$$

where I and S are vectors of school (institution)-level and student-level variables, and EMCA represents the consensus approach implementation; ψ (time specific fixed-effects) and θ (school specific fixed-effects) are scalar parameters, and α and ε are the constant and the random error terms, respectively. There are interactions between EMCA and the school-level variables and between EMCA and the student-level variables.[32]

We were primarily interested in the total effects of the implementation of the consensus approach on affordability, as well as the effects that were specific to particular groups of students, such as low-income and minority students, and students who applied for financial aid.

Using equation 1, the total effect of the CA implementation on price was estimated by $\hat{\delta} + \bar{I}\hat{\eta} + \bar{S}\hat{\gamma}$, where $\bar{I}$ and $\bar{S}$ are averages of I and S taken over the observations for the CA schools during the period of the consensus approach implementation (2003-2004).[33] This measures the effect of the consensus approach implementation on CA schools, relative to non-CA schools, controlling for time invariant differences in schools and other variations over time that are common to both groups. The

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[31]The same model specification is used to estimate the financial aid equations, and tuition equation, which excludes the student-level variables.

[32]In the estimated equations, the interaction terms between *EMCA* and other variables have the suffixes "*;" for example *ENDOWSTU** is the interaction term between *ENDOWSTU* and *EMCA*.

[33]This effect can be tested as a linear restriction if the joint test of significance of *EMCA* and the terms involving *EMCA* is significant.

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coefficient $\hat{\delta}$ measures the unconditional effect of the consensus approach implementation on price, while $\hat{\eta}$ and $\hat{\gamma}$ measure the conditional effects of the consensus approach implementation on price through the school-level variables and student-level variables, respectively.

The expression for the total effects of the consensus approach implementation can be evaluated for particular groups of students by averaging I and S over that particular subset of students. For example, the effects of the consensus approach implementation on prices paid by low-income (INCLO) students can be estimated by

$\hat{\delta} + \bar{I}^{INCLO}\hat{\eta} + \bar{S}^{INCLO}\hat{\gamma}$, where the school-level and student-level variables are averaged over the low-income students. More specifically, the second term is the coefficient estimates of each school-level variable multiplied by the school-level variable averaged over the subset of low-income (INCLO) students attending CA schools after the consensus approach implementation; similarly the average is taken for the third term, which is for the student-level variables.

Alternatively, we can use equation 1 to illustrate the effects of the consensus approach implementation for particular groups. Consider a simple example in which there are two student characteristics, F_{ijt} and A_{ijt}, where F_{ijt} is an indicator variable equal to one if the student is a financial aid applicant and zero otherwise, and A_{ijt} is an indicator equal to one if the student is black, and zero otherwise. Then, using equation 1, the equation for this example is:

$$
\begin{aligned}
Y_{ijt} = \alpha + \sum_{t=2}^{T}\psi_t + \sum_{j=2}^{J}\theta_j + I_{jt}\beta + F_{ijt}\rho_F + A_{ijt}\rho_A + EMCA_{jt}\delta \\
+ EMCA_{jt}I_{jt}\eta + EMCA_{jt}F_{ijt}\gamma_F + EMCA_{jt}A_{ijt}\gamma_A + \varepsilon_{ijt}
\end{aligned}
\tag{1.1}
$$

Now consider a white student who is a financial aid applicant in school j at time t.[34] The predicted price for a white student if j is a CA school is:

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[34]White students are excluded from the race groups in the estimation to avoid the dummy trap.

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$$\hat{\alpha} + \hat{\psi}_t + \hat{\theta}_j + I_{jt}\hat{\beta} + \hat{\rho}_F + \hat{\delta} + I_{jt}\hat{\eta} + \hat{\gamma}_F \qquad (1.2)$$

and the predicted price if j is not a CA school is:

$$\hat{\alpha} + \hat{\psi}_t + \hat{\theta}_j + I_{jt}\hat{\beta} + \hat{\rho}_F \qquad (1.3)$$

The effect of the consensus approach implementation for a financial aid applicant at school j is then the difference between equations 1.2 and 1.3, which is:

$$\hat{\delta} + I_{jt}\hat{\eta} + \hat{\gamma}_F \qquad (1.4)$$

The coefficient $\hat{\delta}$ measures the effect of adopting the consensus approach that is invariant across school and student type, the term $I\hat{\eta}$ captures the differential effect of adopting the consensus approach for a school with characteristics I_{jt}, and the third term, $\hat{\gamma}$, captures the differential effect of adopting the consensus approach for a white student who is a financial aid applicant. Repeating the exercise above for a black student who is a financial aid applicant, the predicted effect of adopting the consensus approach would be:

$$\hat{\delta} + I_{jt}\hat{\eta} + \hat{\gamma}_F + \hat{\gamma}_A \qquad (1.5)$$

The first three terms in equation 1.5 are the same as equation 1.4, while the fourth term captures the differential effect of the consensus approach implementation for a black student. In this example, then, the estimated effect of the consensus approach implementation on financial aid students would be the weighted average of the terms in equations 1.4 or 1.5, with weights corresponding to the proportions of white and black financial-aid students across all schools j that adopted the consensus approach at time t, respectively.

Another estimate of the consensus approach's effect on a particular group is the estimated *differential* effect on a group, given by $\hat{\gamma}$, holding everything else constant. For example, one can ask how a low-income student as compared to a high-income student would be affected by the consensus approach implementation, assuming all other characteristics of

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the student and the student's school are held constant. This estimated effect is simply given by the element of the vector in $\hat{\gamma}$ that corresponds to INCLO. This differs from the total effect of the consensus approach implementation discussed above by taking as given the consensus approach implementation, and by abstracting from the likelihood that low-income students will have other characteristics and attend different schools than non low-income students. We will also discuss the coefficient $\hat{\rho}$, which captures the value of the dependent variable for the particular group in both CA and non-CA schools before the consensus approach implementation, where necessary.

The total effect of the exemption on price as well as its specific effects on particular groups will depend on which theory of the exemption is supported by the data. In particular, we expect price to be lower for disadvantaged students if the social benefit theory is valid; on the other hand, price will increase if the anti-competitive theory is valid. Similarly, the effects of the student-level variables would depend on the theories of the effects of the exemption. For the effects of the school-level variables, ENDOWSTU should be negative because with more resources there is less need to raise tuition and there will be more funds for grant aid. RANKAVG should be negative because as the quality of the school decreases tuition as well as grant aid should decrease. ENROLUG would be negative if higher growth in student enrollment perhaps means more revenues and less need to raise tuition. On the other hand, if students' education is on net subsidized by other sources of school income then ENROLUG would be positive as increased enrollment increases the costs to the school of providing education. And TENURED should be positive if more tenured faculty implies higher quality.[35]

We estimated equation 1 for price, as well as for tuition and the financial aid variables, using probability-weighted regression and robust standard errors, as well as the fixed-effects estimator for panel data.[36] See the

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[35]The effects of these variables on tuition were expected to be similar to that of price. On the other hand, the effects of these school-level variables on the financial aid variables were expected to be opposite to that of price.

[36]The statistical procedure we used is *AREG* in *Stata*.

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regression estimates for price and tuition in table 14, and those for the financial aid variables in table 15.[37]

The regression models for the price, tuition, and financial aid variables are all highly significant using the F-values of the models. See tables 14 and 15. Furthermore, the school-level variables generally have the expected effects. In particular, for the price equation, a student enrolled in a school with an endowment per student (ENDOWSTU) of $250,000 paid about $5,000 lower price.[38] Also, a student paid about $464 less for a school with a unit drop in its selectivity (RANKAVG). Although the effect is not significant, the positive sign for ENROLUG suggests that an increase in enrollment growth may result in a higher price paid, implying that education is net subsidized and increases in enrollment increases the cost of providing education; and vice versa. Finally, a student enrolled in a school with 10 percent higher tenured faculty (TENURED) paid about $3,310 higher. As discussed earlier, the effects of the student-level variables depend on which theory of the effects of the higher education exemption is relevant.[39]

Student enrollment equation:

The regression equation for enrollment into a CA school (ENRCA$_{ijt}$) would depend on student characteristics. Generally, enrollment is the outcome of decision-making that included application, admission, and acceptance of the admission offer. The first and third decisions are made by the student, and the second decision is made by the school. Therefore, in general, both student-level variables and school-level variables would be relevant. However, our approach, as indicated in equation 2, treated the CA schools essentially the same and likewise for the non-CA schools, with differences between the two groups other than the consensus approach implementation captured by the constant term in the regression. The

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[37]The regression estimates for the financial aid variables excluded non financial-aid applicants, which reduced the number of observations but not the number of schools. Similar results were obtained for the price equation when the estimates were based on only financial-aid applicants. The regression estimates for tuition were obtained by excluding student-level variables because students at a school were charged the same tuition.

[38]The $4,800 decrease is approximately equal to $250,000 x –(0.01935).

[39]As discussed earlier, similar arguments can be obtained for the tuition and financial aid variables.

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enrollment equation was thus specified as follows, excluding school-level variables as regressors:

$$Prob(\; ENRCA_{ijt} = 1\;) = \Phi(\; \alpha + S_{ijt}\; \rho + AY2003_t\; \delta + AY2003_t\; S_{ijt}\; \gamma\;)$$

$$(2)$$

Φ is the standard normal cumulative probability distribution function. Similar to equation 1, equation 2 includes student characteristics (with coefficients ρ), time fixed-effects captured by AY2003, and the interaction of the time variable AY2003 with student characteristics (with coefficients γ).[40]

The time specific fixed-effect for AY2003 captures any shift, which is constant across students, toward or away from the CA schools, after the consensus approach implementation, while the interaction terms between the AY2003 and the student characteristics capture shifts toward or away from the CA schools by students with specific characteristics.[41]

The marginal effect of the consensus approach implementation is captured by the effects of AY2003 on enrollment in CA schools. Specifically, this equals,

$d\;[\;Prob(\;ENRCA = 1\;)]\;/\;d(\;AY2003\;) = (\;\delta + S\;\gamma\;)\phi(.),$ where ϕ is the standard normal probability density function. It should be noted that if AY2003 affects the probability of enrollment in CA schools, it would be a valuable suggestive evidence about the potential impact of the consensus approach implementation. However, it would not establish that the consensus approach implementation caused the shift. This is because it is possible that such effects might be due to changes in other factors at CA schools versus non-CA schools (e.g., more rapid endowment growth in the latter than the former). The effect of the consensus approach implementation is the change in the probability of enrollment in CA schools relative to non-CA schools as a result of the consensus approach

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[40]The model could not be estimated with school specific fixed-effects because they predict successes or failures perfectly.

[41]In the estimated equations, the interaction terms between AY2003 and other variables have the suffixes "*;" for example INCLO* is the interaction term between INCLO and AY2003.

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implementation. The overall effect of the CA implementation as well as the effects of the consensus approach implementation on particular groups of students, such as low-income students and those who applied for financial aid, can be obtained similar to the discussion above for the price.

The marginal effect of the student characteristics is captured by the effects of S on enrollment in CA schools. Specifically, this equals,

$d [Prob(ENRCA = 1)] / dS = (\rho + AY 2003 \gamma)\phi(.)$. The effect of the consensus approach implementation on how the probabilities of enrollment of low-income and minority students, and those who applied for financial aid, are affected can be obtained similar to the discussion for the price.

Similar to the discussion for the price equation, the effects of the exemption and the student-level variables on enrollment into CA schools will depend on which theory of the exemption is valid. In particular, the social benefit theory will imply increased likelihood of enrollment into CA schools, especially of low-income students, because prices will be lower. While the opposite will occur with the anti-competitive theory because average price will be higher.

We estimated equation 2 for student enrollment using the probit estimation, with probability weights and robust standard errors.[42] The regression estimates are in table 14.

The regression model for enrollment in table 14 is significant using the chi-square of the model. As indicated earlier, we expect the estimation results will enable us to determine if the likelihood of enrollment into schools implementing the consensus approach by various student groups is more consistent with the social benefit theory or the anti-competitive theory of the effects of the higher education exemption.

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[42]We could not use the panel data estimation technique for probit (*XTPROBIT*) because of lack of convergence. Similar results were obtained when the estimates were based on only students who applied for financial-aid.

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Table 14: Regression Estimates of Effects of Consensus Approach Implementation on Price, Tuition, and Enrollment

Variable	Price	Tuition	Enrollment
EMCA	43,743.75[a] [0.002]	-1,720.72 [0.512]	n/a
AY2003	12,133.55[a] [0.000]	5,650.28[a] [0.000]	0.25751 [0.631]
Student-level			
FINAID	-7,573.33[a] [0.000]	n/a	0.01292 [0.854]
FINAID*	190.21 [0.911]	n/a	-0.30976[b] [0.015]
ASIAN	1,084.13 [0.363]	n/a	-0.01069 [0.910]
ASIAN*	-7,109.66[c] [0.055]	n/a	-0.08486 [0.613]
BLACK	-9,444.68[a] [0.000]	n/a	0.19398 [0.129]
BLACK*	-566.20 [0.921]	n/a	-0.20422 [0.339]
HISPANIC	-4,686.31[a] [0.007]	n/a	0.06790 [0.574]
HISPANIC*	-1,610.12 [0.588]	n/a	0.35354[b] [0.021]
FOREIGN	3,398.09 [0.230]	n/a	-0.25968 [0.221]
FOREIGN*	10,588.17[b] [0.026]	n/a	0.36734[c] [0.054]
OTHER	-2,047.09 [0.407]	n/a	0.02366 [0.887]
OTHER*	-1,077.16 [0.727]	n/a	0.30781[c] [0.059]
EFC	0.10871[a] [0.000]	n/a	2.30e-06 [0.190]
EFC*	-0.00745 [0.872]	n/a	-3.43e-06 [0.219]
INCLO	-8,427.06a [0.000]	n/a	-0.15253 [0.196]
INCLO*	-6,507.64 [0.274]	n/a	-0.15185 [0.489]
INCLOMD	-8,696.19[a] [0.000]	n/a	-0.03045 [0.797]
INCLOMD*	-1,789.68 [0.593]	n/a	0.16593 [0.384]
INCMD	-4,804.25[a] [0.000]	n/a	0.06859 [0.506]
INCMD*	945.64 [0.771]	n/a	-0.16166 [0.303]
INCUPMD	-1,434.39 [0.163]	n/a	-0.03378 [0.689]
INCUPMD*	-1,715.73 [0.522]	n/a	-0.07025 [0.657]
SCORESAT	-2.48 [0.430]	n/a	0.00024 [0.227]
SCORESAT*	-7.82 [0.383]	n/a	0.00013 [0.764]
School-level			
ENDOWSTU	-0.01935[a] [0.001]	-0.00401[a][0.008]	n/a
ENDOWSTU*	-0.01056[b] [0.044]	0.00038 [0.831]	n/a
RANKAVG	-464.33[c] [0.051]	-151.06[c] [0.064]	n/a
RANKAVG*	-798.05[a] [0.000]	36.28 [0.792]	n/a
ENROLUG	19,038.16 [0.785]	35,553.57 [0.133]	n/a
ENROLUG*	-45,843.9 [0.518]	-44,159.24[c] [0.095]	n/a
TENURED	33,100.97[a][0.000]	-610.06 [0.492]	n/a

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Variable	Price	Tuition	Enrollment
TENURED*	-25,823.9[b] [0.014]	4,632.48 [0.315]	n/a
Constant	29,651.89[a] [0.000]	28,746.01[a] [0.000]	n/a
Test statistic of model[d]	22.97[a] [0.000]	375.71[a] [0.000]	37.68[b] [0.050]
R-squared	0.62	0.99	0.06
Sample size	518	28	518
Joint test for EMCA	2.85[a] [0.000]	1.15 [0.460]	18.70[b] [0.133]
Linear restriction test for EMCA[e]	1.18 [0.240]	-0.59 [0.586]	n/a

Source: GAO analysis.

[a]Statistically significant at the 1 percent level or lower. P-values are in brackets.

[b]Statistically significant at the 5 percent level or lower. P-values are in brackets.

[c]Statistically significant at the 10 percent level or lower. P-values are in brackets.

[d]F-statistic values for the price and tuition equations, and chi-square values for the enrollment equation.

[e]t-statistic values for the price and tuition equations, and z-statistic values for the enrollment equation.

Notes: N/A means data are not available or applicable.

* means interaction terms with EMCA for price and tuition equations, and interaction terms with AY2003 for the enrollment equation.

Estimates of price and tuition are obtained using fixed-effects models.

Estimates for enrollment are the marginal effects from a probit model.

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Table 15: Regression Estimates of Effects of Consensus Approach Implementation on Financial Aid

Variable	Total grant aid	Need-based grant aid	Total aid
EMCA	-28,705.63[c] [0.066]	-15,512.93 [0.178]	-50,805.28[b] [0.016]
AY2003	2,159.46 [0.348]	-1,511.37 [0.522]	7,385.03[c] [0.062]
Student-level			
FINAID	n/a	n/a	n/a
FINAID*	n/a	n/a	n/a
ASIAN	-722.86 [0.649]	-740.76 [0.590]	-2,638.73 [0.221]
ASIAN*	6,970.89 [0.142]	6,546.91[c] [0.066]	8,275.76 [0.221]
BLACK	7,914.65[a] [0.000]	4,796.63[b] [0.026]	8,425.58[a] [0.000]
BLACK*	2,546.02 [0.656]	-2,267.21 [0.514]	965.32 [0.862]
HISPANIC	4,709.93[b] [0.023]	2,826.32 [0.140]	2,281.05 [0.389]
HISPANIC*	2,038.96 [0.570]	206.79 [0.947]	2,606.82 [0.622]
FOREIGN	-5,754.55[b] [0.031]	-4,634.40 [0.132]	-11.961.86[a] [0.002]
FOREIGN*	-10,965.98[b] [0.032]	-10,414.55[b] [0.032]	-11,659.21[c] [0.068]
OTHER	4,656.42 [0.169]	5,229.39 [0.129]	4,196.89 [0.349]
OTHER*	-2,813.57 [0.481]	-1,725.88 [0.667]	-4,098.47 [0.496]
EFC	-0.16058[a] [0.000]	-0.149889[a] [0.000]	-0.187923[a] [0.000]
EFC*	0.044382 [0.397]	0.03185 [0.472]	0.006624 [0.929]
INCLO	7,178.94[a] [0.000]	7,932.99[a] [0.000]	3,276.04 [0.177]
INCLO*	7,346.13 [0.239]	6,955.88[c] [0.096]	14,970.89 [0.020]
INCLOMD	8,227.84[a] [0.000]	8,747.21[a] [0.000]	7,153.01[a] [0.001]
INCLOMD*	2,830.62 [0.395]	3,585.08 [0.198]	3,678.72 [0.359]
INCMD	5,084.33[a] [0.000]	3,488.27[b] [0.015]	4,116.59[b] [0.040]
INCMD*	1,835.35 [0.617]	4,773.69 [0.134]	5,366.73 [0.339]
INCUPMD	2,215.09[c] [0.093]	1,699.48 [0.161]	1,643.62 [0.419]
INCUPMD*	600.56 [0.851]	-473.12 [0.873]	2,503.61 [0.632]
SCORESAT	1.23 [0.729]	-0.51436 [0.882]	-3.05 [0.561]
SCORESAT*	10.81 [0.306]	1.97 [0.775]	18.18 [0.170]
School-level			
ENDOWSTU	0.00684 [0.317]	0.01056 [0.144]	-0.00583 [0.512]
ENDOWSTU*	0.001786 [0.774]	0.00272 [0.644]	0.015595[c] [0.092]
RANKAVG	88.79 [0.773]	406.70 [0.114]	58.30 [0.888]
RANKAVG*	140.56 [0.571]	38.06 [0.859]	566.66 [0.178]
ENROLUG	-36,447.82 [0.623]	-238,689.4[a] [0.004]	-12,713.12 [0.922]
ENROLUG*	30,780.66 [0.683]	246,969.5[a] [0.003]	32,081.77 [0.807]
TENURED	-4,340.32 [0.545]	5,070.34 [0.486]	8,685.55 [0.530]

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Variable	Total grant aid	Need-based grant aid	Total aid
TENURED*	15,405.02 [0.204]	16,399.34 [0.103]	11,726.97 [0.514]
Constant	8,727.25 [0.375]	-1331.71 [0.878]	17,640.66 [0.209]
F value of model	14.81[a] [0.000]	16.36[a] [0.000]	8.79[a] [0.000]
R-squared	0.55	0.54	0.36
Sample size	409	409	409
F value of joint test	1.13 [0.328]	1.83[b] [0.026]	1.60[c] [0.067]
t value of linear restriction	n/a	2.05[b] [0.041]	0.64 [0.525]

Source: GAO analysis.

[a]Statistically significant at the 1 percent level or lower. P-values are in brackets.

[b]Statistically significant at the 5 percent level or lower. P-values are in brackets.

[c]Statistically significant at the 10 percent level or lower. P-values are in brackets.

Notes: n/a means data are not available or applicable.

*Means interaction terms with EMCA.

Estimation Results of the Effects of Attending Meetings and Implementing the Consensus Approach[43]

The results of estimating equations 1 and 2 for the total effects of the CA implementation on affordability and enrollment are summarized in table 16, based on the regression results in tables 14 and 15. The results for price and enrollment in table 16 contain the key findings of the entire study, with the other variables (tuition and financial aid) providing information that supplements the findings for price. [44]

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[43]Due to lack of sufficient data, we could not obtain separate estimates of the effects of attending meetings only or the effects of implementing the consensus approach only because it involved only two schools—Brown and Stanford. Also, we could not obtain separate estimates of the effects of implementing fully or partly the consensus approach because only three of the seven CA schools in sample 2 (Georgetown, Vanderbilt, and Wake Forest) had not fully implemented the CA.

[44]All tests are performed using the 5 percent or lower level of significance.

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Total Effects of Implementing the Consensus Approach (from table 16)

Prices:[45]

For the average student, the consensus approach implementation did not significantly change the prices paid by students in CA schools compared to non-CA schools, including the effects on low-income and minority students and students who applied for financial aid.[46]

Tuition:[47]

The CA schools, compared to non-CA schools, did not significantly change the tuition they charged students as a result of the consensus approach implementation.

Total grant aid:[48]

The consensus approach implementation did not significantly change the amount of total grant aid received by students in CA schools compared to non-CA schools.

Need-based total grant aid:[49]

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[45]The results were similar when we limited the data to only students who applied for financial aid.

[46]The effect of the consensus approach implementation on lower-middle income was positive and significant at the 10 percent level. We performed several tests for the total effects of the consensus approach on prices. First, the effect was significant at the 5 percent level when data for only students who applied for financial aid were used. Second, the total effect of the CA on prices was $3,488 and significant at the 5 percent level when ENROLUG and ENROLUG* were excluded from the model. Third, because prices are bounded at the lower end at zero and at the upper end at the cost of attendance, we also estimated the price equation using Tobit regressions. The total effect of the consensus approach on prices was negative and insignificant (at the 10 percent level). Unlike the fixed-effects estimates, the Tobit estimates were unweighted and the standard errors were not robust.

[47]The results are based on the seven CA and the seven non-CA schools in tables 11 and 12. Similar results were obtained when we included the schools that had no SAT scores in AY 2003-2004—three CA schools (Boston, MIT, and Pennsylvania) and two non-CA schools (Tufts and Yeshiva).

[48]The value of the effect of the CA on institutional grant aid was $1,331, but not significant.

[49]The effect of the CA on need-based institutional aid was generally similar to need-based total grant aid. The effect was about $6,020 and significant at the 5 percent level, with a confidence interval of between $512 and $11,528.

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The consensus approach implementation increased the amount of need-based total grant aid received by students in CA schools compared to non-CA schools by about $6,125, with a confidence interval of between $239 and $12,011.[50] The amounts of need-based grant aid received by students in CA schools compared to non-CA schools were higher for middle income students by about $20,221, with a confidence interval of between $6,718 and $33,724. Asian students received higher need-based grant aid of about $14,628, with a confidence interval of between $5,051 and $24,206; Hispanic students received higher need-based grant aid of about $9,532, with a confidence interval of between $1,006 and $18,059; and white students received higher need-based grant aid of about $6,017, with a confidence interval of between $178 and $11,856.

Total aid:[51]

The consensus approach implementation did not significantly change the amount of total aid received by students in CA schools compared to non-CA schools. However, low-income students in CA schools received higher total aid of about $12,121, with a confidence interval of between $1,837 and $22,404.[52]

Enrollment:

The consensus approach implementation did not significantly change the overall likelihood of enrollment into CA schools compared to non-CA schools, for all types of students.

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[50]The value of the effect of the CA on non-need-based grant aid was estimated to be about -$6,873, though not significant; the F-test of the joint significance of EMCA and its interactive terms had a p-value of 14 percent, and the test of the total effect of the CA had a p-value of 2.1 percent.

[51]The value of the effect of the CA implementation on self-help aid (loans, including PLUS, and work study) was $1,034, but not significant.

[52]The value of the total effect of the CA on total aid was estimated to be about $7,140, though not significant; the F-test of the joint significance of EMCA and its interactive terms had a p-value of 20 percent, and the test of the total effect of the CA had a p-value of 1.4 percent.

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Table 16: Estimates of Effects of Consensus Approach Implementation on Affordability and Enrollment in CA Schools Relative to Non-CA Schools

Total effect of consensus approach on…	Price	Tuition	Total grant aid	Need-based total grant aid	Total aid	Probability of enrollment
All students	$3,021	-$433	-$749	$6,125[b]	-$2,886	38%
	[-$2,026, $8,068]	[-$2,465, $1,599]	[-$6,967, $5,470]	[$239, $12,011]	[-$11,805, $6,034]	[8%, 67%]
Financial-aid applicants	$2,177	n/a	n/a	n/a	n/a	22%
	[-$3,319, $7,673]					[-11%, 54%]
Low income	-$4,061	n/a	$3,688	$1,956	$12,121[b]	59%
	[-$15,583, $7,461]		[-$8,511, $15,887]	[-$5,232, $9,144]	[$1,837, $22,404]	[-52%, 170%]
Lower-middle income	$8,089[c]	n/a	-$3,671	$6,556	-$7,776	95%
	[-$263, $16,441]		[-$12,487, $5,145]	[-$2,145, $15,257]	[-$19,776, $4,224]	[6%, 184%]
Middle income	$2,320[d]	n/a	$1,618	$20,221[a]	$1,178	26%
	[-$8,043, $12,682]		[-$11,221, $14,457]	[$6,718, $33,724]	[-$19,616, $21,971]	[-41%, 93%]
Upper-middle income	-$1,048	n/a	-$973	$2,769	-$3,054	18%
	[-$7,641, $5,545]		[-$7,801, $5,855]	[-$3,986, $9,524]	[-$13,177, $7,068]	[-47%, 82%]
High income	$3,699	n/a	-$714	$4,687[c]	-$3,856	31%
	[-$824, $8,222]		[-$6,905, $5,476]	[-$449, $9,824]	[-$12,817, $5,104]	[-6%, 68%]
Asian students	-$376	n/a	$5,726	$14,628[a]	$3,694	1%
	[-$10,426, $9,674]		[-$5,671, $17,123]	[$5,051, $24,206]	[-$13,693, $21,082]	[-78%, 80%]
Black students	$4,468	n/a	-$1,227	$4,332	-$6,542	-26%
	[-$7,452, $16,387]		[-$13,238, $10,783]	[-$4,992, $13,657]	[-$20,353, $7,269]	[-142%, 91%]
Hispanic students	$1,168[d]	n/a	$1,520	$9,532[b]	$3,648	108%
	[-$6,744, $9,079]		[-$8,300, $11,341]	[$1,006, $18,059]	[-$8,981, $16,278]	[-6%, 222%]

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Total effect of consensus approach on…	Price	Tuition	Total grant aid	Need-based total grant aid	Total aid	Probability of enrollment
White students	$2,588	n/a	-$491	$6,017[b]	-$2,879	19%
	[-$2,403, $7,578]		[-$6,766, $5,784]	[$178, $11,856]	[-$11,922, $6,164]	[-14%, 52%]
Number of observations	518	28	409	409	409	518

Schools

CA Schools: Cornell University, Duke University, Georgetown University, University of Notre Dame, Vanderbilt University, Wake Forest University, Yale University

Non-CA Schools: Brandeis University, Bryn Mawr College, New York University, Princeton University, Tulane University, University of Rochester, Washington University at St. Louis

Source: GAO analysis.

[a]Statistically significant at the 1 percent level or lower.

[b]Statistically significant at the 5 percent level or lower.

[c]Statistically significant at the 10 percent level or lower.

[d]Effects were negative when data for only financial aid applicants were used.

Notes: The values in brackets are the 95 percent confidence intervals for the estimates that are significant at the 5 percent level or lower.

"n/a" means data are not available or applicable.

All the monetary values are in 2005 dollars.

Results are based on tables 14 and 15.

The calculated values are based on $\hat{\delta} + \bar{I}\hat{\eta} + \bar{S}\hat{\gamma}$, where the average values are for all students.

The estimates are based on $\hat{\delta} + \bar{I}^{k}\hat{\eta} + \bar{S}^{k}\hat{\gamma}$, where the average values are for the relevant k subgroup of students.

Prior Levels and Differential Effects of the Consensus Approach on Affordability and Enrollment for Students with Particular Characteristics[53]

We discuss the estimates of affordability and the likelihood of enrollment in both the schools that adopted the consensus approach and those that did not, of students with particular characteristics, before the consensus approach was implemented. The estimates are reported in table 17, based on tables 14 and 15. These estimates could help explain the extent to which the consensus approach affected particular groups of students. For instance, if certain students were receiving higher financial aid awards prior to the consensus approach, they may be less likely to receive much higher awards as a result of its adoption. We also discuss the differential

[53]The results for financial aid applicants are relative to non financial aid applicants, those for the income groups are relative to the high-income students, and those for the racial groups are relative to the white students.

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effects on students with particular characteristics that the consensus approach may have had on affordability and enrollment at those schools. The estimates are reported in table 18, based on tables 14 and 15. As already discussed, these estimates indicate how the consensus approach affected students with particular characteristics, assuming all the other characteristics of the students are held constant.

Prices:

Some students paid lower prices prior to the CA implementation; in particular, financial aid applicants relative to non-financial aid applicants; low income, lower-middle income, middle-income students relative to high-income students; and black and Hispanic students relative to white students. But there were no significant differential effects of implementing the consensus approach on prices paid by these groups of students in CA schools.

Total grant aid:

Some students received higher total grant aid prior to the consensus approach implementation; in particular, low-income, lower-middle income, middle-income, black, and Hispanic students.

Need-based total grant aid:

Some students received higher need-based aid prior to the consensus approach implementation; in particular, low-income, lower-middle income, middle-income, and black students. But there were no significant differential effects of implementing the consensus approach on prices paid by these groups of students.

Total aid:

Some students received higher total aid prior to the consensus approach implementation; in particular, middle-income, and black students. But lower-middle income students received lower total aid prior to the consensus approach implementation. Only low-income students in CA schools received higher aid, compared to high-income students, as a result of implementing the consensus approach.

Enrollment:

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Students generally were not more or less likely to enroll in a CA school prior to the consensus approach implementation. However, implementing the consensus approach lowered the likelihood of enrollment of financial-aid students, compared to non-financial aid applicants, while the likelihood of enrollment of Hispanic students increased, compared to white students, in CA schools.

Table 17: Estimates of Affordability and Enrollment before the Consensus Approach Implementation for Particular Groups of Students in Both CA and Non-CA Schools

Students	Price	Total grant aid	Need-based total grant aid	Total aid	Probability of enrollment
Financial-aid applicants[d]	-$7,573[a]	N/A	N/A	N/A	1%
Low income[e]	-$8,427[a]	$7,179[a]	$7,933[a]	$3,276	-15%
Lower-middle income[e]	-$8,696[a]	$8,228[a]	$8,747[a]	-$7,153[a]	-3%
Middle income[e]	-$4,804[a]	$5,084[a]	$3,488[b]	$4,117[b]	7%
Upper-middle income[e]	-$1,434	$2,215[c]	$1,699	$1,644	-3%
High income	N/A	N/A	N/A	N/A	N/A
Asian students[f]	$1,084	-$723	-$740	-$2,639	-1%
Black students[f]	-$9,445[a]	$7,915[a]	$4,797[b]	$8,426[a]	19%
Hispanic students[f]	-$4,686[a]	$4,710[b]	$2,826	$2,281	7%
White students	N/A	N/A	N/A	N/A	N/A
Number of observations	518	409	409	409	518
Schools	CA Schools: Cornell University, Duke University, Georgetown University, University of Notre Dame, Vanderbilt University, Wake Forest University, Yale University				
	Non-CA Schools: Brandeis University, Bryn Mawr College, New York University, Princeton University, Tulane University, University of Rochester, Washington University at St. Louis				

Source: GAO analysis.

[a]Statistically significant at the 1 percent level or lower.

[b]Statistically significant at the 5 percent level or lower.

[c]Statistically significant at the 10 percent level or lower.

[d]The estimates are relative to non-financial aid applicants.

[e]The estimates are relative to high income students.

[f]The estimates are relative to white students.

Notes: Results are from tables 14 and 15, based on the coefficient $\hat{\rho}$ in equations 1 and 2. For instance, the value for price for financial-aid applicants is based on the estimated coefficient FINAID in table 14.

N/A means data are not available or applicable.

All the monetary values are in 2005 dollars.

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Table 18: Differential Effects of Consensus Approach Implementation on Affordability and Enrollment in CA Schools for Particular Groups of Students

Students	Price	Total grant aid	Need-based total grant aid	Total aid	Probability of enrollment
Financial-aid applicants[d]	$190	N/A	N/A	N/A	-31%[b]
Low-income[e]	-$6,508	$7,346	$6,956[c]	$14,971[b]	-15%
Lower-middle income[e]	-$1,790	$2,831	$3,585	$3,679	17%
Middle income[e]	$946	$1,835	$4,774	$5,367	-16%
Upper-middle income[e]	-$1,716	$601	-$473	$2,504	-7%
High income	n/a	n/a	n/a	n/a	n/a
Asian students[f]	-$7,110[c]	$6,971	$6,547[c]	$8,276	-9%
Black students[f]	-$566	$2,546	-$2,267	$965	-20%
Hispanic students[f]	-$1,610	$2,039	$207	$2,607	35%[b]
White students	n/a	n/a	n/a	n/a	n/a
Number of observations	518	409	409	409	518
Schools	CA Schools: Cornell University, Duke University, Georgetown University, University of Notre Dame, Vanderbilt University, Wake Forest University, Yale University				
	Non-CA Schools: Brandeis University, Bryn Mawr College, New York University, Princeton University, Tulane University, University of Rochester, Washington University at St. Louis				

Source: GAO analysis.

[a]Statistically significant at the 1 percent level or lower.

[b]Statistically significant at the 5 percent level or lower.

[c]Statistically significant at the 10 percent level or lower.

[d]The estimates are relative to non-financial aid applicants.

[e]The estimates are relative to high income students.

[f]The estimates are relative to white students.

Notes: Results are from tables 14 and 15, based on the coefficient $\hat{\gamma}$ in equations 1 and 2. For instance, the value for price for financial-aid applicants is based on the estimated coefficient FINAID* in table 14.

N/A means data are not available or applicable.

All the monetary values are in 2005 dollars.

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Limitations of the Study

Sample Selection bias

The findings of the study could be limited by the potential of selection bias if the CA schools had characteristics that we could not control for that made them more inclined to adopt the consensus approach and independently influenced the outcome variables. We believe that this is not a serious problem with the estimation since the difference-in-difference approach includes CA schools before the implementation of the CA, implying the latter selection problem would require significant change over a short time span in the character of these schools. Furthermore, a key factor that might motivate schools to join the 568 Group is the legacy of the Overlap group. The 568 Group has objectives that are similar to those stated by the Overlap group—to be able to offer financial aid to more needy students. Our test indicated that the chances of a former Overlap group member joining or not joining the 568 Group did not differ between the two groups of schools in our sample.[54] Thus, the similarity between the two groups, in terms of a school joining the 568 Group, implied the potential for selection bias may be small.

Measures of Price

In our analysis, the total grant aid does not include self-help aid (loans and work study). However, if the true amount of total grant aid should include some proportion of self-help aid, then its exclusion would lead to an underestimation of total grant aid. Nonetheless, we believe this did not significantly affect our results since we found that the consensus approach implementation did not affect self-help aid.

Early Decision Admissions

It may be that early admit students pay higher prices because early decision admission might be used by need-blind schools as a screening mechanism to indirectly identify a student's willingness-to-pay. Under the early decision process a non-financial aid student is therefore more likely to be admitted than a financial-aid student of comparable quality.[55] We did

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[54]We tested for the equality of the proportions of CA schools and non-CA schools that were members of the former of the Overlap group. We used the 11 CA schools and the 14 non-CA schools in samples 1 through 4 in table 9. The CA schools had 5 Overlap members and the non-CA schools had 3 Overlap members.

[55]See Kim (2005).

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not expect the early decision process to affect our results because while the process might help identify a student with a higher willingness to pay, it is the student's ability to pay that determines the need-based aid offered by the 568 Group. Furthermore, the total probability of enrollment of a financial-aid applicant was similar to that of a non-financial aid applicant both before and after the consensus approach implementation, even though the consensus approach implementation tended to decrease the likelihood of enrollment of financial-aid students.

Excluded Schools of Comparable Selectivity

We could not include all the schools affiliated with the 568 Group in the analysis because of data limitations. (See the list of unmatched treatment schools in table 9.) However, there were several similarities (in terms of "best college" ranking, endowment, tuition and fees, and percentage of tenured faculty) as well as differences (in terms of freshmen enrollment) between the included and excluded CA colleges.

Limited Data Availability

The data were available for only one academic year period after implementation of the consensus approach. This could mask potential effects of the consensus approach since these effects could be gradual, rather than immediate, and therefore take time to for the effects to be captured. Also, the small sample size of the data could make the estimates less precise, especially for some of the subgroups of students we considered. However, we checked to ensure that the estimates were consistent with the data by estimating the predicted values corresponding to the observed mean values for price, the key variable of interest, and the financial aid variables. The results, presented in table 19, show that the predictions of our model are consistent qualitatively with the observed data.

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Table 19: Comparison of Observed and Predicted Price and Financial Aid Variables in CA and Non-CA Schools: Pre— and Post—Consensus Approach Implementation Period

	CA Schools			Non-CA Schools		
	1995-1996	**2003-2004**	**Difference**	**1995-1996**	**2003-2004**	**Difference**
Price						
All students						
Observed	$28,039	$35,488	$7,449	$28,068	$30,838	$2,770
Predicted	$30,791	$37,171	$6,380	$25,386	$27,882	$2,496
Financial-aid						
Observed	$25,845	$32,897	$7,052	$24,960	$29,705	$4,745
Predicted	$28,222	$34,352	$6,130	$22,347	$27,330	$4,983
Non financial-aid						
Observed	$34,645	$44,504	$9,859	$37,714	$44,292	$6,578
Predicted	$38,771	$46,625	$7,854	$35,127	$34,973	-$154
Low income						
Observed	$12,566	$10,095	-$2,471	$18,950	$21,886	$2,936
Predicted	$14,272	$11,389	-$2,833	$13,613	$18,106	$4,493
Lower-middle-income						
Observed	$19,220	$30,437	$11,217	$17,623	$20,546	$2,923
Predicted	$20,650	$32,075	$11,425	$15,156	$19,501	$4,345
Middle-income						
Observed	$24,785	$34,201	$9,416	$22,560	$26,069	$3,509
Predicted	$26,035	$36,438	$11,838	$21,092	$20,764	-$328
Upper-middle-income						
Observed	$26,285	$32,310	$6,025	$29,429	$34,305	$4,876
Predicted	$31,423	$35,121	$3,698	$26,566	$27,616	$1,050
High income						
Observed	$32,616	$39,496	$6,880	$33,137	$34,138	$1,001
Predicted	$35,538	$41,043	$5,505	$31,129	$32,582	$1,453
Financial aid—						
All students						
Total grant aid						
Observed	$9,142	$9,775	$633	$13,391	$13,960	$569
Predicted	$10,285	$11,877	$1,592	$12,181	$13,194	$1,013
Need-based grant aid						
Observed	$7,771	$6,439	-$1,332	$11,863	$8,122	-$3,741
Predicted	$7,443	$6,170	-$1,273	$12,277	$9,151	-$3,126

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	CA Schools			Non-CA Schools		
	1995-1996	**2003-2004**	**Difference**	**1995-1996**	**2003-2004**	**Difference**
Total aid						
Observed	$16,604	$16,046	-$558	$19,827	$22,255	$2,428
Predicted	$17,998	$17,957	-$41	$18,425	$20,127	$1,702

Source: GAO analysis.

Appendix III: Classification of 1999-2000 Academic Year and Schools Only Attending the 568 Group Meetings

We conducted tests to determine whether to use data collected in academic year 1999-2000 and whether schools that attended meetings of the 568 President's group but did not implement the consensus approach could be included in our analysis. First, the academic year 1999-2000 was very close to the establishment of the 568 President's Group, which occurred in 1998. The 1999-2000 academic year might have been a transitional period, and it would therefore not be appropriate to use the data as part of the period before the 568 Group implemented the consensus approach. Second, there were five schools, among the schools with data available for our econometric analysis, that either only attended the 568 Group meetings (Case Western Reserve University, Stanford University, and University of Southern California) or were members of the 568 Group but had not implemented the CA as of 2003 (Brown University and Dartmouth College). We therefore investigated which group—control or treatment—each of the five schools belonged.

Does Academic Year 1999-2000 belong to the Pre– or Post–Consensus Approach Implementation Period?

We used the data for sample 4 to investigate if data collected in 1999-2000 belonged in the pre-CA period (with data collected in 1995-1996). Although both samples 1 and 4 have data for 1995-1996 and 1999-2000, we chose sample 4 because it was the larger sample. See table 9 in appendix II for the list of the schools in each sample and the academic years for which data were available.

The tests were performed using the Chow test, which is of the form:[1]
(1) $y = \beta01 + \beta11\ x1 + \beta21\ x2 + u$, $u \sim N(0,\sigma2)$, for group = 1995-1996 (g1), and
(2) $y = \beta02 + \beta12\ x1 + \beta22\ x2 + u$, $u \sim N(0,\sigma2)$ for group = 1999-2000 (g2).

Pooling the two groups of data we estimated,
(3) $y = \beta01 + \beta11\ x1 + \beta21\ x2 + (\beta02–\beta01)g2 + (\beta12–\beta11)g2x1 + (\beta22–\beta21)g2x2 + u$, where g2 is an indicator variable.

The test examines the hypothesis that the added coefficients are jointly zero: $(\beta02–\beta01) = (\beta12–\beta11) = (\beta22–\beta21) = 0$.

An insignificant test statistic (a small test statistic and a large p-value) suggests that the above equality holds, and there is no difference between the estimates for 1999-2000 and the group with which it is compared (1995-

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[1]See http://www.stata.com/support/faqs/stat/chow3.html for details.

1996). On the other hand, a significant statistic (a large test statistic and a small p-value) suggests that the above equality does not hold and the 1999-2000 is different from the group with which it is compared (1995-1996).

We combined 1999-2000 with 1995-1996 and tested if the coefficients for 1999-2000 differed from that of 1995-1996, using sample 4. The tests were done for price, the key variable affecting student outcomes for schools. We performed a joint test that the added coefficients in equation 3 are jointly zero. The F-value is 1.71, and significant with a p-value of 0.0375. This implied that data collected in 1999-2000 did not belong to with the 1995-1996 data in the pre-CA period.[2]

Similarly, we examined if 1999-2000 belonged to the post-CA period by combining 1999-2000 with 2003-2004, using sample 3. The F-value of the joint test is 8.36, and significant with a p-value of 0.0. This implied that 1999-2000 data did not belong to with the 2003-2004 data in the post-CA period.

These results suggest that it was more appropriate to exclude 1999-2000 from the analysis, implying that samples 1 and 2, which have data for the pre-CA period (1995-1996) and the post-CA period (2003-2004) would be more appropriate. However, because sample 2 was larger than sample 1, our subsequent analysis used sample 2.

Do the Schools That Only Attended the 568 group Meetings belong to the Control or Treatment Group?

We performed an analysis similar to that described above to determine whether schools that only attended meetings—Brown University, Case Western Reserve University, Dartmouth College, Stanford University, and University Southern California (USC)—belonged in the treatment or control group. We determined whether the behavior of each of these schools was more consistent with the control schools or the treatment schools after the consensus approach implementation, using data for 2003-2004. Since we had determined from the above analysis that samples 1 and

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[2]As expected, the estimates from the pooling (equation 3) are the same as for the separate estimates (equations 1 and 2). Also the residual variances from equations 1 and 2 were similar, suggesting that the pooling was appropriate. This applies to all the other Chow tests we performed.

2 are more appropriate for our subsequent analysis, we focus on sample 2, the larger sample, for these tests.[3]

To Which Group Did Brown Belong—Control or Treatment?

Similar to the analysis in section above, we included Brown in the control group and tested if the coefficients for Brown differed from the control group. We performed a joint test and obtained an F-value of 25.68, significant at 0.00. This implied that Brown did not belong to the control group. For the treatment group test, the F-value was 7.37, significant at 0.00. This also implied that Brown did not belong to the treatment group. Thus, Brown did not belong to either the control or treatment group.

To Which Group Did Stanford Belong—Control or Treatment?

The F-value for the control group test was 19.16, significant at 0.00, and the F-value for the treatment group test was 5.59, significant at 0.00. This implied that Stanford did not belong to either the control or treatment group.

To Which Group Did USC Belong—Control or Treatment?

We tested for which group USC belonged by excluding the SAT scores variable (SCORESAT) from the model since the data were not available for 2003-2004. The F-value for the control group test was 23.23, significant at 0.00, and the F-value for the treatment group test was 12.54, significant at 0.00. This implied that USC did not belong to either the control or treatment group.

Based on the above analysis, we determined that the best data for our analysis was sample 2, and we excluded all five schools that only attended the 568 Group meetings but did not implement the consensus approach.

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[3]The test was not performed for Case Western Reserve and Dartmouth because they are in samples 4 and 3, respectively. Samples 3 and 4 cannot be used because there are no data for 1995-1996 and 2003-2004, respectively.

Appendix IV: Comments from 568 Presidents' Group

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September 5, 2006

To: Andrea Sykes
        United States Government Accountability Office

From: Morton Owen Schapiro
        Chairman of the 568 Presidents' Group and
        President and Professor of Economics, Williams College

Re: A Response to the Draft Report on the Activities of the 568 Group

Thank you very much for providing the opportunity to respond to your draft
report on the activities associated with the 568 Presidents' Group and its use
of the Consensus Approach methodology. As you agreed in communication
with Jim Belvin, chairman of the 568 Group's Technical Committee, your
draft report has now been reviewed by a number of financial aid directors
from 568 schools, by several of our government relations experts, and by a
group of economists with special expertise in education finance (I am a
proud member of this last group). I am happy to respond on behalf of all
these individual reviewers.

In summary, while we appreciate the fact that the GAO has completed
another in a long line of careful and objective reports, we have a number of
questions about the data as presented and analyzed in your draft report and,
perhaps even more importantly, about its premise and tone.

The Premise for the Study and the Tone of the Draft

The anti-trust statute upon which the 568 exemption is granted provides,
among other things, need-blind institutions the right to create a common
approach for determining parent ability to pay. We believe that the 568
Presidents' Group has developed a carefully crafted methodological

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construct. The 568 Presidents' Group and this new methodology have
resulted in the following positive outcomes:

- the aid system is now more transparent, reducing confusion among
  parents and students;

- by pioneering a variety of new approaches, some adopted
  nationally via The College Board and its institutional
  methodology, we have redefined family ability to pay in a fairer
  and more logical manner;

- we have provided the 568 Group's financial aid community with a
  forum for discussing ways in which college applicants and their
  parents can be better served as they seek ways to finance their
  higher education expenses;

- we have empowered aid directors to exercise carefully defined
  professional judgment in support of students with unusual
  circumstances;

- we have increased the number of schools that are need-blind as
  several institutions have adopted that practice in order to gain
  membership in the 568 Group community; and

- we have engaged college presidents more fully in setting policy for
  the administration and distribution of financial aid grant resources
  on their campuses.

At the same time, we have avoided the worries raised when the exemption
was first issued. There is no evidence that exempting our institutions from
antitrust laws has stifled competition or that there has been any collusion
aimed at reducing student aid expenditures at member institutions. To the
contrary, our efforts have led to increased access to need-based financial aid,
an increase in the average need-based grant awarded to students attending
both 568 Group and other institutions, increased need-based grant funding
available to low-income students, and increased need-based grant funding
for middle-income students.

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The combination of a range of positive impacts, along with the complete
absence of any evidence of individuals being hurt through this limited anti-
trust exemption, implies strongly that the public interest has been served by
the 568 exemption. We respectfully suggest that the tone of your report –
including its title – presents a somewhat misleading picture of the substance
of your findings. An alternative title could be "Schools' Use of the Antitrust
Exemption Enhances Transparency and Equity Without Increasing the Net
Price."

We turn next to some concerns and suggestions regarding your empirical
analysis. Those of us experienced in these kinds of studies know very well
that data limitations hinder even the most careful analyses.

Treatment and Control Groups-the Selection Process

We worry that the selection process for the treatment and control institutions
may have biased your empirical results. We note, for example, that
Princeton, the wealthiest (in terms of endowment per student) and most
generous institution in the country, is included in the Control Group while
MIT, one of the most generous 568 institutions, was left out of the
Treatment Group (you indicate that MIT was excluded because they failed to
submit SAT data while officials at MIT state that all data were submitted as
requested). We believe that the construction of these groups would almost
certainly serve to lower average grants for the Treatment Group while
increasing average grants for the Control Group.

Much is made of the apparent increase in so-called merit awards. In
reviewing the actions of the Treatment Group, we find that non-athletic,
merit awards have increased very little, if at all. This would appear to be
confirmed by Figure 4 on page 18. We do note that four of the institutions
included in the Treatment Group offer athletic merit scholarships while only
one of the institutions included in the Control Group awards funds based on
athletic merit. We believe that this fact has served to skew the data by
suggesting that non-need-based aid funding has increased at a faster rate
than has need-based aid.

Given that almost thirty institutions helped craft the Consensus Approach
and have implemented it in one fashion or another, analyzing the results of
only seven almost certainly skews the data. Why, for example, include only

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research universities? And why not include Amherst and Williams, both full participants in the creation and implementation of the Consensus Approach?

The Use of Low-Income Students as a Standard of Comparison

We have serious worries about the use of low-income students as a yardstick for judging the success of the Consensus Approach. While we understand that the GAO has every right to choose the standard by which the Consensus Approach is judged, we would make several points in this regard:

- The Federal Methodology (FM) establishes maximum aid eligibility for students receiving federal funds. This expected family contribution (EFC) is based on consideration of the parents' (custodial and step-parent if appropriate) and a student's ability to support educational expenses during the enrollment period. The Consensus Approach, with the exception of assets saved in the student's name, judges only the parent's ability to support educational expenses. Summer savings expectations, which constitute the largest portion of the student contribution, are established individually by Consensus Approach schools. As 568 institutions use the Consensus Approach for the Parent Contribution rather than EFCs, it is inappropriate to compare EFCs established by participating institutions with those established by the Federal Methodology.

- The "overaward provision" embedded in federal Title IV regulations establishes an EFC cap for each student receiving federal student aid. Institutions may not lower the student's FM EFC without documentable cause or the exercising of professional judgment. Further, low-income EFCs are almost all income driven. FM does not provide institutions with the option of eliminating or reducing reported and continuing family income.

  In this regard, it is essential to point out that FM EFCs are not always consistent with EFC results as developed by the Consensus Approach. In fact, recent changes in the FM state tax tables have resulted in FM EFCs that often exceed those generated by the Consensus Approach. As a result, 568 institutions are increasingly forced to increase contributions above the levels set by the Consensus Approach simply to avoid violating the federal Title IV "overaward" provision. Said

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another way, average Consensus Approach contributions are higher than they would otherwise be because of the need to comply with the federal overaward provision. This, of course, lowers the amount of need-based grant available to students.

- The changes to the Institutional Methodology (IM) made by the 568 Group when creating the Consensus Approach were driven by policy rather than results. To that end, we focused on IM policies and practices that, in our judgment, failed to recognize the "paying for college" realities faced by today's families. The cost-of-living tables developed by our group are a perfect example. Although our efforts specifically did not target particular income groups, we did make common sense changes that we felt would expand access and encourage families to look ahead and begin planning for college. These changes ultimately affected families with resources, including considerable amounts of home equity, funds saved in their children's names, etc. Because middle- and upper-middle-income families are more likely to have such resources, they are also more likely to benefit from Consensus Approach changes. Likewise, low-income families benefit from the Consensus Approach if they have or acquire such resources.

- Finally, we would be remiss if we did not reiterate our concern with your interpretation of Congressional intent. In reviewing the exemption and the discussions that surrounded the creation and extension of Section 568, we did not interpret Congressional intent to have focused on making college more affordable for low-income students or other under-represented groups. Instead, we understood Congress to have had a more general interest in creating a stable environment grounded in common sense that reduced confusion among applicant families, began to moderate parent contributions, and retained and expanded public confidence in need-based aid as a vehicle for helping to insure access to higher education opportunities.

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The 568 Presidents' Group Serves as a Workshop for Need-Analysis Theory and Practice

As noted earlier, the work of the 568 Presidents' Group as reflected in the Consensus Approach, has served to influence the more broadly used Institutional Methodology. Additionally, many institutions have unilaterally incorporated various aspects of the Consensus Approach into their individual institutional need-analysis methodologies. The effect of this intellectual cross pollination should not be overlooked as it has, no doubt, served to reduce the differences in results across a wider group of institutions.

To this point, an important, but overlooked aspect of the 568 exemption is that it has allowed qualified institutions to work collectively to refine and improve the manner in which family ability to pay is defined. Almost all 568 Group institutions are spending additional need-based grant funds as a result of the more generous Consensus Approach and its flattening of parent contributions. Absent the 568 antitrust exemption, this important benefit would be lost.

Data Concerns

The following comments address our concerns about data collection and interpretation.

- The study indicates on pages 17-18 that, over five years, average need-based grant awards for the Treatment Group increased by 6% while costs of attendance increased by 13%. Data available to the 568 Group suggest that the former figure may be low. Of the four institutions in the Treatment Group that are also members of the Consortium on Financing Higher Education (Cornell, Duke, Georgetown, and Yale), data from that organization indicate that during the four-year period (2000-1 to 2004-5) for which such numbers are available, average grant aid increase by 28% (inflation adjusted) from $16,690 to $21,832. While the data from the other three non-COFHE schools in the Treatment Group may mitigate these figures some, your 6% figure still strikes our collective experience and intuition as being far too low.

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- In figure 1, page 7, the cost of attendance includes "family" and disability expenses. Federal cost of attendance rules specify that cost-of-living expenses may include only those incurred by the enrolled student, not the family. Disability expenses are included only where such expenses can be shown to be non-discretionary and unreimbursed.

- Table 1, page 8, indicates that a cost-of-living variance is not included in the Institutional Methodology. In fact, the Institutional Methodology has adopted the cost-of-living tables developed by the 568 Group.

- Page 9 notes that twenty-eight schools formed a group that, among other things, developed a common methodology for assessing financial needs. In fact, the work of the 568 Group has been limited to developing a Consensus Approach for determining Parent Contributions. Need is a product of many factors, including each institution's cost of attendance, summer savings requirements, and packaging policies.

- Page 10 indicates that membership is open to institutions that, among other things "pay membership dues." This is technically incorrect. Participating institutions share the Group's expenses but pay no membership dues.

- Footnote 7 on page 10 indicates that Macalester College attended meetings but did not join the 568 Group. Although Macalester later withdrew from the Group because it was no longer eligible, it was a founding member.

- Paragraph 2 on page 11 indicates that "Some school officials also noted that awarding aid only on the basis of need was a very contentious issue and would greatly limit the number of schools willing to participate in the group." In fact, several 568 institutions make merit awards. There have been no discussions about limiting a participating institution's desire to award merit aid.

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- Table 3 on page 13 indicates that the Institutional Methodology
  and the Consensus Approach treat divorced and separated parents
  in the same manner. In fact, the Consensus Approach developed
  an innovative approach for such families. This approach has in
  large part been adopted by the Institutional Methodology.

- Comparing pricing practices at 568 Group schools with those at all
  other private 4-year schools seems inappropriate. There are over a
  thousand independent colleges and universities in the U.S., almost
  all of which are ineligible for 568 Group membership because they
  are not need-blind and few of which would be interested in making
  use of the Consensus Approach or, for that matter, the Institutional
  Methodology.

- Figure 3, page 17 indicates that the number of students receiving
  various types of institutional grant aid increased and then
  decreased during the period from 2000 to 2006. While this is
  likely true, it should be noted that this is a predictable result of an
  improving economy. As families' circumstances improve, their
  ability to support educational expenses increases while their aid
  eligibility decreases. The number receiving aid will likewise
  increase if and when the economy declines.

- In Table 5 and Table 16 the report notes that total need-based grant
  aid is $20,221 higher per student, on average, at CA schools. This
  seems to be inconsistent with other data presented in the report.
  For example, Table 13 indicates that the average need-based grant
  for middle-income students was only $10,767 in 2003-2004.

- A number of conclusions appear to have been based on a very
  small number of observations, all within one academic year. Table
  12 on page 46, for example, reports on students not receiving aid at
  CA schools using only 19 observations while only 6 observations
  are used to report similar data for non-CA schools.

  Likewise, Table 13 on page 47 characterizes 2003-2004 low-
  income data for CA institutions using only 3 observations. The
  2003-2004 lower-middle-income data at non-CA schools is based
  on 5 observations.

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Limitations of the Study

Sample Selection Bias

This observation states "Furthermore, a key factor that might motivate
schools to join the 568 Group is the legacy of the Overlap group." (p. 69) In
fact, only six members of the 28 member 568 Group were also members of
the Overlap group. It should be noted that Overlap group institutions
actually compared results and tried to agree on a common response.
Members of the 568 Group have used the antitrust exemption to accomplish
the purpose for which it was intended, i.e., the creation of a common
approach to need analysis managed locally by individual institutions.
Results are not compared nor are they standardized.

Early Decision Admissions

This observation notes "It is likely that early admit students tend to pay full
price because early decision admission can be used by need-blind schools as
a screening mechanism to indirectly identify a student's willingness-to-pay."
(p. 69) Although many 568 institutions use the Consensus Approach for
early decision, the fact that each of these schools is need-blind means that
the decision to admit is made before aid eligibility is determined. Moreover,
early decision programs have traditionally resulted in yields far in excess of
regular decision programs. Yields are often above 90% because students
who apply for early decision have determined that they will attend if they are
admitted and offered aid.

Post-treatment Period

The draft report notes "The data were available for only one academic year
period after implementation of the Consensus Approach. This could mask
potential effects of the consensus approach since these effects could be
gradual, rather that immediate, and therefore take time (to) for the effects to
be captured." (p. 70) We certainly agree with this point, but would suggest
that no conclusions be reached until additional results are available for
review.

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Summary

Although the 568 Presidents' Group and its Consensus Approach to determining parent ability to pay are relatively new phenomena, we believe that your study confirms the value of the 568 antitrust exemption and the manner in which it has been used. Its successes include an increase in average need-based grant funding, enhanced transparency, improved ability for families to plan for future educational expenses, greater public confidence in need-based aid, more engagement by presidents in aid-related discussions, and growth in the number of institutions offering need-blind admissions. As a result of these successes, we believe that the work of the 568 Presidents' Group should be celebrated and promoted. We would encourage you to reflect this success in your report to Congress.

Thank you very much for providing us with the opportunity to respond to your draft report.

Appendix V: Consultants and Peer Reviewers

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The following individuals made important contributions to the report: Sherri Doughty, Assistant Director; Andrea Sykes; John A. Karikari; Angela Miles; Daniele Schiffman; John Mingus; Dayna Shah; Richard Burkard; Susan Bernstein; Rachel Valliere; Robert Alarapon; Thomas Weko; and L. Jerome Gallagher.

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