



## **Financial Aid: Caltech vs. HYPSM**

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# Background

The California Institute of Technology is private research university located in Pasadena, California. Their mission statement is to “expand human knowledge and benefit society through research integrated with education. [They] investigate the most challenging, fundamental problems in science and technology in a singularly collegial, interdisciplinary atmosphere, while educating outstanding students to become creative members of society.” The California Institute of Technology, or Caltech, is a small university with about 900 undergraduate and 1200 graduate students. It is ranked in the top ten universities worldwide by many rankings. Caltech is known to provide generous financial aid packages and recently also declared that it will start replacing loans with grants.

## Six Forces Analysis

### Product

The product that Caltech and other top universities provide is threefold. First, the consumer gains higher knowledge not easily obtainable anywhere else. They become trained in their field of preference sufficiently well to get good jobs in their field and/or admission to top grad schools. Second, the consumer also purchases reputation and credibility. Lastly, they also purchase the opportunity to network with other potentially successful students.

### Competition

Caltech competes with other top tier schools for elite students. This project focuses primarily on Harvard, Yale, Princeton, Stanford, and MIT. Many of these schools recently changed or announced changes in their financial aid policies.

#### Harvard

- Families earning less than \$60,000 will contribute 0% of their total income.
- Families earning between \$60,000 and \$180,000 to contribute between 0% and 10% of their total income, unless they have unusually substantial family wealth.

#### Yale

- Families with incomes below \$120,000 will see their contributions cut by more than 50%, while most families with incomes between \$120,000 and \$200,000 will see cost reductions of 33% or more.
- Families earning less than \$60,000 annually will not make any contribution toward the cost of a child’s education.
- Families earning \$60,000 to \$120,000 will typically contribute from 1% to 10% of total family income.
- The contribution of aided families earning above \$120,000 will average 10% of income.

#### Princeton

- There will be no loans, only grants.
- They have the lowest self-help (work-study) requirement of rival universities
- The average financial aid grant covers 90 percent of Princeton’s tuition

## Stanford

- Parents with incomes of less than \$100,000 will no longer pay tuition.
- Parents with incomes of less than \$60,000 will not be expected to pay tuition or any other expenses.

## MIT

- Families earning less than \$75,000 a year will have all tuition covered and the student loan expectations eliminated.
- For families earning less than \$100,000, MIT will eliminate home equity in determining their need.

## Rivalry

Among the top schools, there is a lot of competition for the top students. While they are differentiated and there are students who are attractive to Caltech who aren't as attractive to Harvard and vice versa, there are many students who are desired by most if not all of the top schools. While schools have changed their financial aid policies over time to make sure that it is at least possible for most students to attend, recent changes by Harvard, Princeton, and Yale have attracted a lot of publicity, and most other schools with smaller endowments can't match their new policies. These changes affected the rivalry of the market, as financial aid in the past had been slowly increasing as the schools engaged in a price war, and now aid among top schools is unlikely to increase any time soon. The quality of aid packages has become another selling point for a few universities, as families on aid may now pay extremely different amounts at different colleges.

## Substitutes

There are no perfect substitutes for an elite college education. Attending a less prestigious university is an option and can provide a comparable education, which is the most important service Caltech provides, but less prestigious schools don't provide the same opportunities to network with top students or the same instant reputation of a diploma from a top institution.

## Potential Entrants

There are several schools trying to break into the elite college market, such as Washington University-St. Louis and Olin College. These schools do not have the reputation of the elite colleges, but are trying to build it by spending large amounts of money on professors and top students. However, building a college reputation can take decades. There are also only so many elite high school seniors and there may not be enough to fill both the elite schools and the up-and-coming schools.

## Buyer Power

In this context, the buyers are the prospective students and their families. The students that the top tier schools admit are at the top of their class, and will more than likely receive admission to several of the universities. Each school presents different price tags and financial aid packages that the buyers can choose from. Even if students claim to have better deals in other places, Caltech will not change its award to match it. Caltech has their own method of distributing aid, although it is taking into account how much their competitor's strategies affect their success of creating a desired incoming class.

The appeal of a school to a student does not only depend on the price; it depends greatly on the

quality of the school, quality of student life, career opportunities and other various characteristics an incoming freshman hopes for in their alma mater. The many factors that a buyer considers make it harder for the supplier to successfully fill every need. The solution for many schools is to make the price more convenient, since after all characteristics of a school is considered, the price tag can make or break the deal.

## **Supplier Bargaining Power**

There are several groups who could be considered suppliers. As far as the money necessary to provide a college education, 50% of Caltech's revenue (not counting JPL) comes from government grants which we compete for yearly with other schools, but the money doesn't come with strings attached, so those suppliers don't have bargaining power. 15% comes from returns from our endowment, which is already ours, and 6% comes from tuition and fees plus room and board, where there isn't any bargaining, and 8% comes from auxiliaries and other sources, which is fairly vague. 21% of our revenue comes from private gifts, grants, and contracts. These suppliers do have some limited bargaining power. Gifts sometimes come with restrictions such as requiring that the money be spent on specific projects, and private grants and contracts also can have stipulations attached. For the most part though, Caltech's financial suppliers don't have much bargaining power at all.

On the other hand, the faculty and professors also can be considered suppliers, and they have a considerable amount of bargaining power. Faculty can choose to research pretty much whatever they want to, and they also have a say in what kind of students they want admitted; although they may be considered employees, they have a lot of decision making power. Since our faculty is the main supplier of a college education here and many of them are extremely difficult to satisfactorily replace, they have a lot of bargaining power.

## **Barriers to Entry**

The major barriers to entry into the elite college market are the expense of starting a new college and building a reputation. Starting a new college is extremely expensive, and since most educational institutions are not for profit, the money has to come from philanthropic gifts, not from investments. This makes entry into the market difficult and costly, and since there is generally no return, entry is fairly uncommon even though the demand is bigger than the supply. Building a reputation is extremely difficult and usually takes a lot of time. Most of the top schools with great reputations have been around for over a hundred years (Caltech and Stanford, both established in 1891, are the youngest schools that we are including in this study). Although there are many schools that are trying to build reputations quickly, building a reputation is expensive, and a reputation is extremely helpful when trying to recruit top students. Having a good reputation usually requires having top faculty and students/alumni, but it is difficult to get either of those without already having a reputation. This catch-22 has kept the number of elite schools fairly small and provides a giant barrier to entry.

## **Complements**

There are several complements to a college education. The most important compliment is the availability of jobs after graduation or potential acceptance to graduate or professional school. Schools help provide this complement through their reputation. Another important complement to a college education is the extracurricular activities and social life that the school offers.

## **Differentiation**

The college market is extremely differentiated. Each school has its own reputation and niche where it excels. The schools we are studying are at the top of the market, so there can be many different firms that compete on something other than price. The enormous differentiation is clearly demonstrated each year by thousands of high school seniors who spend vacations visiting schools, and then agonize over which schools they like and want to attend. If the market wasn't differentiated, they wouldn't have to spend as much time picking their schools.

## **Cooperation**

Up until about a decade ago, the top universities used to sit down face to face and barter the top elite admitted students. University A would offer a large financial aid offer and the other universities would agree to offer that student a much lower package in order to convince the student to attend University A. The same would be done for other top students with the other universities in the group. Universities were trading students like baseball cards. Because they were explicitly trading people, there was little competition for the top pool of admitted students, and the assumption was that this, on average, depressed the financial aid offers for students. A lawsuit ensued against the Overlap Group: MIT, University of Pennsylvania, Columbia University, Cornell University, Dartmouth College, Harvard University, Princeton University, and Yale University. They were accused of collusion and violating the Sherman Antitrust Act. In light of this lawsuit, all but MIT decided to change their behavior and sign a consent decree agreeing to stop the meetings. With regards to legal action, the Ivy League universities would rather fold than risk fighting, and to avoid folding will undertake preventative measures and change their behavior.

As it turned out, MIT fought and won the lawsuit in August '91, establishing that the meetings were not in violation of the antitrust laws, but the collusion model was irrevocably wrecked. Today, the elite schools are fairly competitive and, until this year, had been engaged in a price war in merit-based financial aid for a limited pool of students.

## **Price and Market Segmentation**

The price and market segmentation of this industry is similar to that of a monopolistic competition. Though there are many firms in the industry, few of them have already created a reputation or a brand. Each major university creates its own section of the market that they monopolize. Even though there are overlaps between consumers of some partitions of the different markets, the final purchase that the consumers decide to make will ultimately be still the same two to three firms that they prefer. Following those traits of a monopoly, the firms will price discriminate to maximize their producer surplus and reducing the consumer surplus greatly. The way the universities do this is the use of financial aid. They alter the price of each product based on the willingness of the consumer to purchase it. Universities do this by modeling data from previous years and calculate how much each consumer would probably be willing to pay in his or her given condition.

## **First Mover Advantage**

In 2001, Princeton had changed their financial aid policies to eliminate loans (packages consisted of grants only), give them a first-mover advantage. This was followed by a tit-for-tat strategy for need-based financial aid by the top universities. Universities were eager to engage in this sort of price war because it allowed them to claim that they were affecting social changes through financial aid policies. It gave them the selling point that they were admitting lower-class students and giving them

upwards mobility. It also allowed them to defend against accusations of legacy-fostering admissions.

In January 2008, Harvard announced a differed policy need-based financial aid to limit parents' payments to 10% of their income if their household income was between \$120K and \$180K. This policy is directed against the class of people that had been largely ignored by financial aid – families with too much money to qualify for financial aid but not enough money to comfortably support rising college costs, especially for families with more than one child. Students with parents earning under \$120K now pay nothing. Yale and Princeton announced similar policies in later months, but didn't get the reaction that Harvard did.

Harvard had a distinct first-mover advantage with the enormous amount of press they received for their new policies. Yale and Princeton, however, met with criticism following their own announcements of financial aid changes. Yale and Princeton increased the financial aid, but not quite to the level that Harvard did, and certainly not more. Their students noticed and the two institutions were criticized for it, but no other universities tried to match Harvard's astonishing policies. Harvard has made such a huge leap that the tit-for-tat pricing war in need-based financial aid was officially broken.

## **SWOT Analysis**

### **Strengths**

#### Timing of Entry

Harvard set the bar first, changing the way that many colleges operated just to keep up and still compete. Harvard was the first to take away the early action option from the application process because they felt that it gave the "advantaged more advantage." Not much later, they put together the financial aid plan that catalyzed changes in other colleges. By making the first move, Harvard has pressured other colleges to change their ways, and also have demonstrated to the students that their intentions are genuine in wanting to help financially, rather than just trying to keep competitive within the market.

#### Marketing

The financial aid that is being promoted speaks only for the radical changes for those with low annual income. But the way it is marketed makes it sound as though the privileged will also get benefited when that is not really the case.

### **Weaknesses**

Colleges that offer these enormous financial aid packages must now find a way to make up for the profit loss. Either more money needs to be raised, or more percentage of the endowment should go to funding student's educations. There is definitely a limit to the money raised and how much should go to the students.

Students could also apply or attend a cheaper school that may not have the same prestige as the big name schools. They could be turned off by the effort in applying for aid and discouraged that they might not receive any. In many situations, students decide to only apply for financial aid to one school and not bother with any others. This eliminates chances for schools to offer a package that will better suit the student's needs.

Private Universities must also compete with Public Universities where students can go to school

for such a smaller price. With the prestige with some of the public schools such as Berkeley and UCLA, this could get tricky.

## Opportunities

Caltech has already found its niche. It can expand the business by actions such as diversification of student body but that will have no major effect.

## Threats

- Entrance of other rising universities that may attract Caltech's students.
- Better financial aid from Caltech's current competitors.
- Other universities advance faster in research obtains grants Caltech needs.

## Caltech's Strategy

Caltech does not need to implement a financial aid plan similar to Harvard's to stay competitive. Implementing a plan would not strategically benefit Caltech, but would cost the Institute money that could be spent elsewhere. However, the Institute should continue to monitor its financial aid compared to its competitors, and ensure that its aid offers are not drastically lower than its competitors.

Caltech's mission "is to expand human knowledge and benefit society through research integrated with education." This mission can best be fulfilled by admitting the best possible students and ensuring that they matriculate here. Due to the high cost of a Caltech education, financial aid is necessary to ensure that bright students who would not otherwise be able to afford tuition can attend. Caltech should continue to keep its policy of making every admitted student able to afford the cost of attending.

Harvard had other ideas in mind when it raised its financial aid. Instead of focusing solely on finding the best students, they are trying to set up their college as an instrument of upward mobility and social engineering. In 2005, as Harvard started its first major financial aid initiative, William C. Kirby, dean of the Faculty of Arts and Sciences, said "Harvard can do its part to alter the unacceptable disparity in economic background that characterizes the college-going population nationwide." Caltech should not be in the business of equalizing economic backgrounds- instead, it should focus on its mission of scientific research and education.

Caltech does not have to worry about improved financial aid plans from Stanford and MIT, who are closer competitors than Harvard, Yale, and Princeton. While these plans look impressive on paper, they are not nearly as comprehensive as Harvard's plan. Most of their changes are marketing. For example, MIT promises that if your family income is less than \$75,000 per year, your tuition will be covered. While this may sound impressive, students at Caltech with the same financial situation have had their tuition covered for at least several years.

Because Caltech is differentiated from its competitors means that matching plans dollar-for-dollar is not completely necessary. Unlike its competition, Caltech is known for its unique student body, difficult course load, and extreme focus on science. However, Caltech must maintain this differentiation, or it will have to start matching financial aid offers dollar-for-dollar to attract the best students. We strongly support the existing work of various committees on campus that try to maintain Caltech's traditional excellence in the sciences, and worry that attempts to soften some parts of Caltech will remove the Caltech's distinct qualities.

Although Caltech does not have to match Harvard's price plan dollar-for-dollar, it does need to do a better job of marketing its financial aid. Many high school students are not aware of Caltech's financial aid offers when they are searching for schools. These students may simply resign themselves to an inexpensive state school after seeing Caltech's "sticker price". Even worse, many potential students may not even bother to look at Caltech because they believe they will not be able to afford it. Leaving these students behind compromises Caltech's goal of having the best incoming class regardless of ability to pay.

We suggest that Caltech provide more public financial aid information, including some guideline cases to reassure prospective students and their parents about Caltech's financial aid. This information needs to be at the front wherever the cost of attending is mentioned. Caltech information sessions, tours, phone programs, and mailings should all reflect its financial aid programs to ensure that all potential students know that they will be able to afford Caltech.

A school's admissions website is possibly the most important piece of information that it maintains for prospective students. Caltech's admissions website should be changed to reflect an emphasis on financial aid rather than the cost of attendance. Most prospective students already know that Caltech costs a lot- but they probably don't know how much aid is offered. Caltech doesn't have to go as far as other schools, which advertise admissions and aid as a single department (see the websites for Princeton and Harvard). However, the section on "Affording Caltech" needs to be re-written with an emphasis on aid. We suggest that the title of the section be changed to "Financial Aid" to help put financial aid, rather than the "sticker price", at the front of a prospective student's mind. The cost section should include average financial aid grants to keep the costs in perspective. Also, the front page should include some example financial aid packages to offer concrete evidence of the excellent financial aid offers.

Another idea that Caltech should adopt is tying increases in tuition to increases in financial aid. As most students and parents are aware, the cost of higher education rises each year. Caltech should offer that increases in tuition will be matched by a percentage increase in total financial aid awarded. This plan would ensure that students and parents can consider Caltech without worrying about future increases in tuition and fees. This plan, the first of its kind, would also give Caltech a spot in the media to advertise the rest of its financial aid programs.

Finally, Caltech needs to continue to monitor the financial aid market and ensure that its offers do not fall significantly short. While a dollar-for-dollar for match is not necessary due to Caltech differentiation, its differentiation cannot support an arbitrary price increase. Caltech should follow up with admitted students who chose not to attend and ensure that financial aid is not leading to decreased yields.

## **Where will the market be in 5 years?**

Prior to the collusion case in the 1990s, colleges were meeting and bargaining for elite students through financial aid packages. As a result, they were spending the minimum collective amount of money for a select distribution of students. Since the case, the schools no longer talk to each other about the students they admit, resulting in an environment of high competitiveness, a price war for the very best students, and an increasing pool of merit money for a constant pool of students. Some may have predicted that this would bankrupt elite American education, but for some reason this did not happen, and, in any case, Harvard broke the price war by jumping so far ahead that the market cleaved into two brackets of elite colleges.

The market is beginning a fracturing process in which three of the top six schools, Harvard, Princeton, and Yale, have bumped themselves into an even higher bracket, leaving Stanford, MIT, and

Caltech behind in a slightly lower bracket.

This may be an indicator for what the market will be in five years, with the market experiencing a widening gap between these two brackets. This will decrease the competitiveness between the two brackets because they will each be targeting different groups. They still want the “best” students to attend their schools, but Harvard, Princeton, and Yale will inevitably get the best and brightest of the middle-class applicant pool, where we loosely define ‘middle-class’ as families with a household income in the \$120- to 180,000 range. The lower bracket of schools and the rest of the schools in the “Top 25 National Colleges” list cannot afford to compete with Harvard, Princeton, and Yale for the middle-class and will therefore compete for the best and brightest students of the upper class.

However, looking at what the yields were for 2008, it is entirely possible that nothing will change in the market. According to MIT’s student newspaper, as well as those of Harvard, Princeton, and Yale, the yield remained steady or only dipped slightly for these three colleges. Harvard’s and Yale’s yields were near 78% and 69% respectively, similar to past yields, and Princeton’s yield dropped one percent from 69% to 68%<sup>9</sup>. These numbers are questionable indicators, though, because the new financial aid programs were announced after most deadlines for freshman admissions this year, so there were no additional students applying *because* of the announcement, and because Harvard and Princeton both eliminated their early admissions programs, resulting in more students applying to more schools.

Interestingly enough, Caltech is now in a bracket with Stanford and MIT, the two schools from which it most wants to attract students away. In terms of financial aid, Caltech is very competitive against MIT and Stanford, but Caltech loses 80% of students to these two schools every year among the students who were accepted to both Caltech and either MIT or Stanford. Consequently, Caltech would have to look at the other factors affecting undergraduate matriculation in order to be more competitive against MIT and Stanford for the best students.

## Future Plans

In the near future, Caltech wants to become more competitive with universities such as Stanford and MIT because students accepted to all three are decide against going to Caltech 60% of the time. Caltech should better market itself and its financial aid packages to reduce this figure significantly. Caltech should strive to be considered the best of the three universities. Caltech needs to focus on these two schools in particular because they attract the students drawn to its main purpose, which is research.

Currently, Caltech has one of the highest percentages of alumni who go on to receive PhDs of all major universities. It shows that not only are the undergraduates at Caltech academically brilliant, many are genuinely interested in science and research. This is a prominent attraction for many distinguished researchers and professors. Since hiring undergraduates is much cheaper than hiring graduate students and the undergraduates at Caltech are capable of a wide variety of skills needed for such labs, these professors and researchers are much more willing to work at Caltech as compared to other universities. Caltech needs to maintain that edge and play to its strength.

Thus, Caltech is very dependent on the skills and the reputation of its undergraduate class which is being stolen away by other famous science magnets such as Stanford and MIT. At least from the financial aid point of view, Caltech will have to work to tip the balance for any student deciding to attend a school solely based on financial aid. It will have to have a financial aid system more attractive and lucrative than those offered by either of those schools.

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