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Using the Community College to Control College Costs: How Much Cheaper Is It?

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Abstract

Data from NCES indicates that it is two to three times more expensive to educate a student at a public four-year college than at a community college. These figures exaggerate the difference between the two when you calculate the costs of the first two years of education for students working on a bachelor's degree. Using modified IPEDS data from the recently released Delta Project, this study shows that the cost per FTE and the public subsidy per FTE are lower at public master's level colleges than at the community college. Trend data from 1987-2005 is examined.

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Despite widespread media attention, the rapidly rising cost of getting a college degree rarely makes the list of the top ten most pressing problems in American public opinion polls (Polling report, 2008). Yet, since a college degree has become the arbiter of opportunity for entry into the American middle class (Carnevale, 2008) the concern over the inability to pay for it has the potential for causing a deep social divide within the country. Among those within the higher education community, however, the rising cost of obtaining a bachelor's degree and the widening gap between opportunities for the rich and poor, are important topics of discussion (see Bowen and others, 2005 as an example). There is no shortage of academics and politicians offering an analysis of the cost problem (for different perspectives see, Ehrenberg, 2000; Vedder, 2004; Boehner & McKeon, 2003; Martin, 2005; and Archibald & Feldman, 2008; Wellman, 2008). Most recently, the highly publicized report from the Commission on the Future of Higher Education (2006) (better known as the Spellings commission report) focused the nation's attention on the high costs and low accountability of postsecondary education.

Among the solutions mentioned for lowering the cost of obtaining a bachelor's degree is greater use of local community colleges for the freshman and sophomore years (Dickeson, 2004; Advisory, 2008). The question of just how much this option might save is the focus of this article.

Comparing College Costs

Comparing the costs of going to a community college versus a four-year college is not a simple matter. It is probably easiest when considered from a student perspective, although the calculation would be different for each individual student. Let's assume that we have a single dependent student who has just graduated from high school and wants to obtain a bachelor's degree. The choice might be either attending a local community college for the first two years and living at home or attending a nearby university or college and living away from home. Which one is cheaper for the average student? Outcomes aside it is generally less expensive at the two-year college. The tuition is usually lower and the cost of housing can be kept down by living at home (although commuting costs may be higher). Since lost income is a major cost of going to college, we might also argue that the opportunity cost of lost income is lower because staying at home, where they are familiar with the local labor market, makes it easier for students to work while they attend the local community college. But, if it is cheaper for the average student, is it also cheaper for the public sector that is subsidizing that student? Perhaps, but this is less obvious. It depends on the state and how we measure costs. It also depends on whether we are talking about the costs to the federal, state or local government.

Our purpose here is not to explore cost from a student perspective nor to assess the costs and benefits that a student might consider in making such a college choice. Rather, our purpose is to ask whether it is less expensive for the taxpayers to educate a student at a public community college than it is at a public four-year college for the first two years of college. We will not differentiate between federal, state, and local expenditures but will lump them together under the heading of public subsidies.

Throughout this article we will refer to cost, price and subsidies in the traditional way. Their relationships and their trends were recently explored in an excellent report from the Delta Cost Project (Wellman, Desrochers, and Lenihan, 2008). When we use the word cost we do not mean tuition only, but rather the full cost of that education, no matter who is paying it. Cost is defined and measured by what a college spends per student; price, on the other hand, refers to the proportion of cost covered by tuition, which, from a student perspective, may or may not be covered by financial aid; and subsidy is the difference between cost and price, which, in the case of public institutions, is mostly paid for by public appropriations (Delta, 2008). When we say that the public is worried about the rising cost of higher education, as we referenced at the beginning of this article, we almost always mean the price and not the real or full cost of educating a student. In the research community, there is a general consensus that, “in public higher education, prices are increasing, costs are remaining fairly steady, and subsidies are declining” (Delta, 2008, no page number).

From a national perspective we can begin to estimate the difference in the cost of educating a student for the first two years of a four-year degree at a community college as opposed to a four-year college by looking at aggregate data from the National Center for Education Statistics and published each year in the Digest of Education Statistics.

Data Sources

NCES/IPEDS. In her keynote address at the annual meeting of the American Council on Education in February 2008, Gail O. Mellow, the president of LaGuardia Community College (CUNY), argued that community colleges suffer from inadequate financial support. In support of her argument, she stated that “per capita spending at public

community colleges is \$9,183—compared to \$27,973 for four-year college students” (figures for 2000-01, reported on Inside Higher Education, Feb. 11, 2008). These figures are from the National Center for Education Statistics (NCES) as reported in the Digest of Education Statistics (2005, Table 341) and are presented in summary form in Table 1 below.

Table 1 Current Fund Expenditures per FTE of Public Colleges for 2000-01 (in 2001 dollars)

| | |
|---------------------------------|----------|
| 4-year | \$27,973 |
| Doctoral, extensive | 37,738 |
| Doctoral, intensive | 21,290 |
| Master's | 13,886 |
| Baccalaureate | 12,309 |
| Specialized institutions..... | 101,090 |
| Art, music, or design | 28,427 |
| Engineering or technology | 23,794 |
| Medical or other health | 325,371 |
| Tribal | 22,159 |
| Other specialized | 18,231 |
| 2-year | \$ 9,183 |
| Associate of arts | 9,173 |
| Tribal | 17,096 |

The figures are accurate as far as they go and refer to the average (mean) cost per FTE rather than the per capita figures quoted from her speech. In fact, NCES figures such as these, showing operating costs at the four-year college as double or triple those at the two-year college, are frequently used by researchers and in the media. However, they most surely exaggerate the difference between the costs, or spending per student, for our purposes, for the following reasons.

First, as seen in Table 1, the figures for the four-year colleges referenced by President Mellow include expenditures by all public colleges and universities including the most expensive research, medical and engineering colleges. If public policy, or simply high

costs, were to divert some students from four to two-year colleges, it is likely that most of them would not come from the most expensive research and graduate institutions. They would likely come from less selective colleges that are classified as bachelor's or master's institutions. At these predominantly undergraduate colleges, the average operating expenditures per FTE student for 2000-01 was \$12,309 and \$13,886 for baccalaureate and master's institutions respectively. This is less than half of the \$27,973 figure cited above.

Second, the double or triple cost difference exaggerates the spread between the four and the two-year college because it measures the average cost of educating a student at the four-year college over a typical four-year, or more, degree program. It is more expensive to educate upper division undergraduates than freshmen and sophomores, largely because the classes are smaller and perhaps more specialized equipment is necessary for some upper division classes. To be more accurate, we should consider what it would cost each type of college to educate a student for the first two years only.

Third, the cost difference would be narrowed if we used the median rather than the mean average cost. When considering national data and using mean expenditures, the highest cost colleges bring the average up. The more typical college would be represented by the median. This point is emphasized in the Delta Cost study which shows that the difference between the mean and the median for public research universities is 25%, while for the two-year college, the mean is only 7% higher than the median (Wellman, Desrochers & Lenihan 2008, p. 48).

NCES expenditure data comes mainly from figures submitted to the U.S. Department of Education each year by colleges in their IPEDS (Integrated Postsecondary Education Data System) report. One of the problems in using data from IPEDS is that it is not always compatible when measuring costs over a multiyear period. This is because the IPEDS survey of colleges has changed over time. “During the 1987 to 2005 year period, [for instance], there have been three changes in IPEDS reporting formats” (Wellman, Desrochers and Lenihan, 2008, p.45). These changes have limited researchers’ ability to conduct cost studies over multiyear periods using NCES/IPEDS data (as an example, see Archibald & Feldman, 2008, p. 293, note 8). The data presented in the Delta Cost Project study is an improvement.

Delta Cost Project. The Delta Cost Project (its full name is the Delta Project on Postsecondary Education Costs, Productivity and Accountability) has received major funding from the Lumina Foundation. It has calculated data on operating spending and revenues into aggregate measures of costs per student and costs per degree/certificate produced, organized into Carnegie classifications, separating public and private nonprofit institutions.

The Delta Project data uses institutional data reported to IPEDS. In addition, it imputes small amounts of missing data and supplements IPEDS with other national data where necessary. Most importantly, it adjusts the widely published NCES data to account for the changing definitions and IPEDS reporting procedures over time. As it stands, the adjusted IPEDS expenditure data from the Delta Cost Project provides the best cost data available for our purposes.

Previous Studies

An early study of college finance by Estelle James, often cited in the economics literature, stated that when you look at national data it appears that “community college students cost more, pay less, and hence receive a greater annual financial subsidy than do lower division university students” (James, 1978, p.178). Working with data from the 1950’s and 60’s she estimated that, within public higher education, the lowest cost and public subsidies were at public research universities and that the subsidies paid to the community college per FTE were about one and one-half times the amount given to educate lower division undergraduates at the four-year level in the mid-1960’s (James, 1978, p. 176 Table 6). Reviewing her research and several others in their seminal study on community college finance, Breneman and Nelson (1981) concluded that “in general, the level of resources and subsidies spent on community college students does not differ widely from that spent on their lower division counterparts at senior public institutions” (p.118).

A more recent study of the cost difference between the two-year public college and the four-year public college was done by Cecilia Rouse using 1992-93 data from NCES on mean costs per FTE student (Rouse, 1998). Excluding capital costs, she estimated that, on the surface it appeared to be almost twice as expensive at the public four-year college (a \$3117 difference in 1994 dollars). However, after adjusting the four-year college figure to take account of the more expensive upper-division courses and a minimal number of graduate students, the cost advantage of the two-year college was reduced to \$935 per FTE student. Since the tuition at the two-year college is usually lower than at the four-year college, she surmised that the public subsidy to the two-year college per

FTE student might be greater. However, in the end, she concluded that conservative estimates suggest that it more likely costs the public sector “about the same or less” to educate a student for the first two years at a community college (Rouse, 1998, p. 614).

Romano (2003) did a follow-up study employing the method suggested by Rouse. Using updated NCES data, he estimated that for 1996-97 it was from \$1000 to \$1500 less expensive to educate a student (FTE) for the first two years at a community college. He calculated that the public subsidy per FTE student was about the same at each type of institution and that the lower cost of the public two-year college was passed on to the student in the form of lower tuition.

The most recent national study which presents data on the cost differences between two-year and the four-year college is the afore mentioned Delta Cost Project on college costs. It does not do the same kind of analysis as Rouse (1998) and Romano (2003) but it does provide the data necessary to do so. The college expenditure figures from the Delta Project are most useful for our purposes because they can be used to meet the three criteria set out above for comparative studies. That is, it uses, or can be used, to calculate the median costs per FTE, and the difference in educating students for the first two years of college only. It also separates research universities from those that are predominantly under-graduate in nature. But most importantly, it adjusts the IPEDS data for changes in accounting procedures which makes multiyear comparisons of costs more accurate.

The Delta expenditure (cost) data is separated by type of institution and control according to their Carnegie classification. This includes public research, public masters, public associates, private research, private masters and private baccalaureate colleges and universities in all states. For purposes of comparison we have selected the public

associate and public master's colleges. Public master's colleges have been selected over public baccalaureate colleges because they are more typical of the colleges that community college students would transfer to or be diverted from. The Carnegie public baccalaureate list for 2000, for instance, is very short and includes only one college from Florida and one from California. Many states have no public baccalaureate institutions listed.

What's does the data show?

Table 2 uses current college expenditure data per FTE student from the Delta Cost Project and employs the method of analyzing that data from Rouse (1998). The educational and general spending figures, which exclude capital costs, are used to calculate costs and "is a category that existed in IPEDS prior to accounting changes introduced in the late 1990's" (Wellman, Desrochers and Lenihan, 2008, p.23). Figures for 2005 are presented for purposes of illustration but the same analysis is later performed for the years 1987 to 2005 for our trend analysis.

Table 2. Median expenditures, tuition and fee revenue and subsidies per FTE at public two- and four-year colleges, 2005 (in thousands of 2005 dollars)

| Educational and general expenditures per full-time equivalent (FTE) student | | | | | | |
|---|--------|---------------------------------|---------------------------|-----------------------|-----------|-----------|
| | Total | Minus research & Public Service | Minus R, PS & fixed costs | Tuition & fee revenue | Subsidy-1 | Subsidy-2 |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Two-year college | 9291 | 9110 | 6075 | 2698 | 3377 | 6412 |
| Four-year (public) college ^a | 11,581 | 11,095 | 7113 | 5003 | 2110 | 6092 |
| Four-year (public) college adjusted (lower division) ^b | 7638 | 7318 | 4691 | 5003 | (312) | 2315 |
| Difference: 4-yr. minus 2-yr: | | | | | | |
| Four-year college (unadjusted) | 2290 | 1985 | 1038 | 2305 | (1267) | (320) |
| Four-year college (adjusted) | (1653) | (1792) | (1384) | 2305 | (3689) | (4097) |

Source: Delta Cost Project IPEDS Database; and U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), 2006. Computation by DAS-T Online Version 5.0 on 11/13/2008

Col. 1 = operating costs (excludes capital costs).

Col. 3 = col. 1 minus research (R) and public service (PS) and fixed costs (administration; operation and maintenance of plant)

Col. 5= col. 3 minus col. 4

Col. 6= col. 2 minus col. 4

a= public master's level (excludes research universities)

b= 4-year college figures are adjusted to approximate the costs of lower-division instruction. According to IPEDS data (2005) undergraduates comprise 87.6 percent of master's level public college FTE enrollments. Following Rouse (1998, p.615, Table 7), we assume that 60% of undergraduate FTEs are lower-division students: graduate students are weighted at 3.75, upper-division undergraduates at 1.5, and lower-division undergraduates at 1.0. This results in dividing the unadjusted 4-year college costs by 1.5162 (also see Breneman and Nelson, 1981, p. 116, Table 3-8)

Looking at the first two figures in column 1, we can see the national average (median) total educational and general expenditure per FTE student for two-year and four-year colleges (\$9,291 vs. \$11,581). These expenditures exclude capital costs which are thought to be higher at the four-year level. They also exclude spending for self-supporting activities such as bookstores and dormitories. The figures in column 1 indicate that it cost \$2290 less to educate an FTE student at the two-year college. But, as we have

suggested, these cost figures are not strictly comparable since the four-year college will have upper-division and graduate students who would be more expensive to educate. Following Rouse, and adjusting the four-year figures for these factors, gives us a crude estimate of costs at the two-year level compared with those at the lower-division level at the four-year college (\$9291 vs. \$7638). Looking at median average costs in this way, we can see that it is less expensive to educate students for the first two years of a bachelor's degree at the 4-year level.

Columns 2 and 3 in Table 2 subtract out various costs of operation in an attempt to narrow down the figures so that an estimation of the marginal (additional) cost of educating a student at each level can be calculated. For column 2 we follow Rouse and subtract research and public service expenditures, and for column 3 we reduce that amount by the fixed costs of administration and the operation and maintenance of the plant. The treatment of fixed costs deserves some attention. Fixed costs should be those costs which do not vary with the level of output. In this case we would need to look at the number of students rather than any output measure. Typically, fixed costs would include some measure of the cost of capital but we have excluded capital costs from our analysis for reasons mentioned later. Following Rouse, we are left with a fixed cost figure which includes academic and institutional support and the portion of capital costs in the operating budget represented by the operation and maintenance of the plant.

Looking at both columns 2 and 3 we can see that the two-year college has lower costs than the four-year college. But again, if we adjust the cost for the four-year college to reflect lower-division study, we get a different picture. This downward adjustment swings the cost advantage to the four-year college. At the bottom of column 2 the four-

year college shows a \$1792 per FTE student cost advantage and with fixed costs eliminated a \$1384 cost advantage over the two-year college. So, on a crude marginal cost basis, it appears to cost between \$1400 and \$1800 less per year to educate a lower-division student at a four-year college, if we ignore capital costs.

In order to get an estimate of the public subsidy for both the two- and the four-year public college, we must subtract the average tuition and fee costs paid by the students. Typically, as with Rouse, we would use the sticker price for full-time, in-state students to represent the tuition and fee payments. However, for our purposes, it would be more accurate to use the tuition and fee revenue per FTE received by the college. This would be the revenue from this source, less any discounts, that the college actually records in its budget. For public institutions, state and local subsidies and the small private grants (less than two percent for each type of college) they receive, would make up the difference. For 2005, the median revenue from tuition and fees was \$2698 for the public two-year college, and \$5003 for the public four-year college (Wellman, Desrochers and Lenihan, 2008, Table B4). Column 5 (subsidy-1) uses Rouse's method for calculating this public subsidy. It shows subsidies going to four-year colleges ranging from \$2110 to minus \$312 per FTE compared to the \$3377 per year that goes to the two-year college. The last two figures in column 5 show the differences. The negative subsidy of \$312 means that the four-year college collects more in revenue than the lower division student costs to educate. This negative subsidy was only found for the year 2005 and not for any of the other years (1987-2004) that we have data. In the likely case that tuition continues to rise faster than public subsidies, freshmen and sophomore students at the four-year college will be even more profitable to enroll.

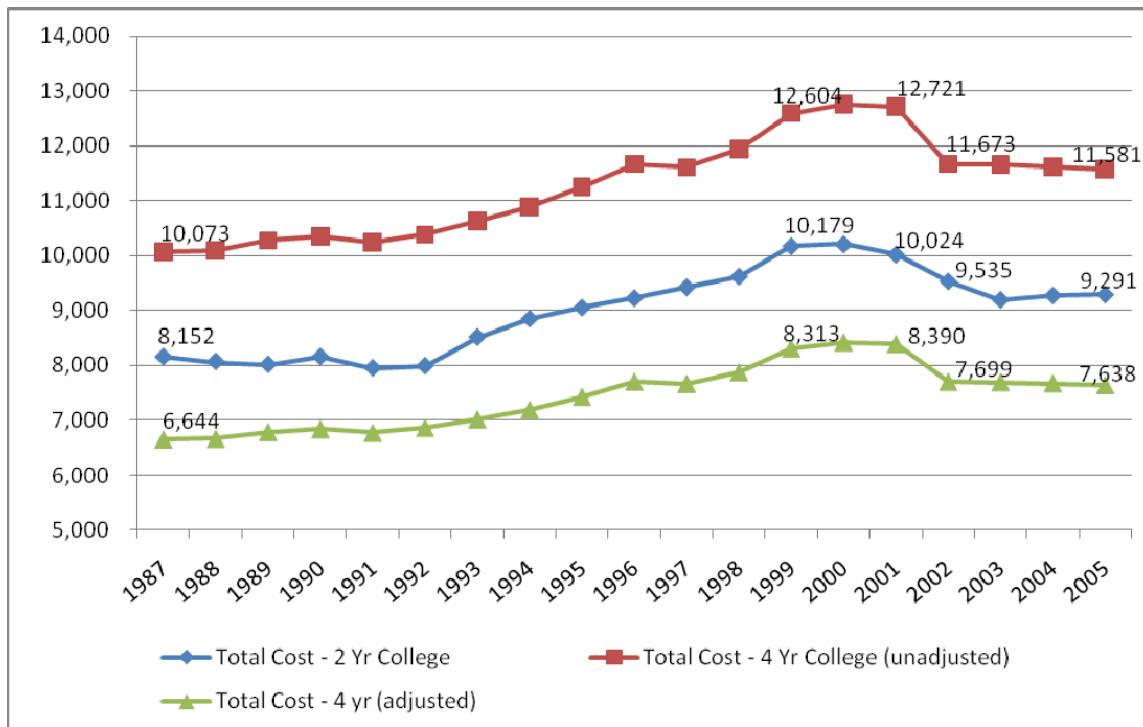
However, it seems that column 6 (subsidy-2) incorporates a more realistic measure of costs than those used by Rouse. These subsidies are based on the median expenditure figures listed in column 2, which include the fixed costs of administration and the operation and maintenance of the plant. Excluding fixed costs is the typical procedure in economics when estimating marginal costs. It is justified when talking about the short-run where, for instance, the diversion of students from the four-year to the two-year college would be considered temporary. But, if a state's master plan does not see this diversion as temporary, we really should be looking at the long run, where all costs must be covered. As Gordon Winston has argued, "marginal cost looks a whole lot like average cost in higher education" (Winston, 1999, p. 33). If we include fixed costs as part of the median FTE cost, the cost advantage for the two-year college of \$1985, shown at the bottom of column 2, turns into a \$1792 advantage for the four-year college once we adjust it for lower division students. Since the community college has \$2305 less tuition and fee revenue per FTE than the four-year college the subsidy to the latter is \$4097 lower than that given to educate students at the two-year college. Once we start talking about the long run we should also include capital costs in our calculations. Following Rouse, capital costs were excluded from all of the figures in Table 2 because the existence of excess capacity was assumed. This is not a good assumption for the long-run. Capital costs are assumed to be higher for the four-year than the two-year college. We don't have a good estimate of capital costs per FTE student but including them, and considering the fact that many community colleges are now building dormitories, would probably reduce but not eliminate the advantage that the four-year college has over the two-year college both in terms of a lower FTE cost and subsidy.

From this analysis, we conclude that the shift of bachelor-degree-seeking freshmen and sophomores from the four-year to the two-year college would cost the public sector about \$4000 per year more per FTE in 2005 dollars. If additional funding could not be found, colleges would be pressured to reduce costs by employing more contingent faculty, increasing class size, reducing student services and/or employing the host of belt tightening procedures so prevalent in recent years. Of course, these are national averages. All states have different costs, tuition levels and degree of public subsidies.

Trend analysis

The analysis profiled in Table 2 was carried out for the years 1987 to 2005. All figures are adjusted for inflation using the consumer price index. Figures 1-3 show some of the results. As Figure 1 shows, when looking at unadjusted data, the two-year college maintains a cost advantage over the master's level colleges throughout this period. Costs generally rise from 1987 to 2001 but fall after that period. However, after we adjust the four-year college data to account for only the freshman and sophomore years, we find that the costs per FTE student per year are higher at the two-year level for the entire 1987-2005 period.

**Figure 1 Median FTE Costs for Two- and Four- Year Colleges, 1987-2005
(in 2005 dollars)**



Rouse (1998) calculated the level of public subsidy for the 1992-93 year and speculated that it might be higher for the two-year college than for the first two years at the four-year college. Using her method we have calculated the same subsidy (subsidy-1) for the period 1987-2005. The results are shown in Figure 2. In it we see that she was right and that the same can be said for the entire 1987-2005 period. In addition, by the year 1997 the subsidy going to the two-year college was even higher than the subsidy going to the four-year college, unadjusted.

Building on Rouse, our analysis of the subsidy level (subsidy-2), assuming that fixed costs must be covered, is shown in Table 3. Here the subsidy to the two-year college is higher than it is to the four-year college, on an adjusted basis over the entire 1987-2005 period. Looking at the unadjusted data, which includes all students at the master's level

colleges, we find that, before 2004, their subsidy is higher than that going to the two-year college but after that, it falls below it. Considering the entire 1987-2005 period, the two-year subsidy has fallen from \$6706 per year per FTE student in 1987 to \$6412 in 2005, a decline of 4.4 percent in constant dollars. On the other hand, the decline for the four-year was 18.3 percent based on the unadjusted data and 43.7 percent for the adjusted data. This seems to reflect the relative favoring of the two-year college and, at the master's level colleges, of upper-division and graduate education over education for the first two years or college.

Figure 2 Subsidy-1 Median FTE Public Subsidies for Public Two-Year Colleges vs Unadjusted and Adjusted Data for Four-Year Colleges, 1987-2005 (in 2005 dollars)

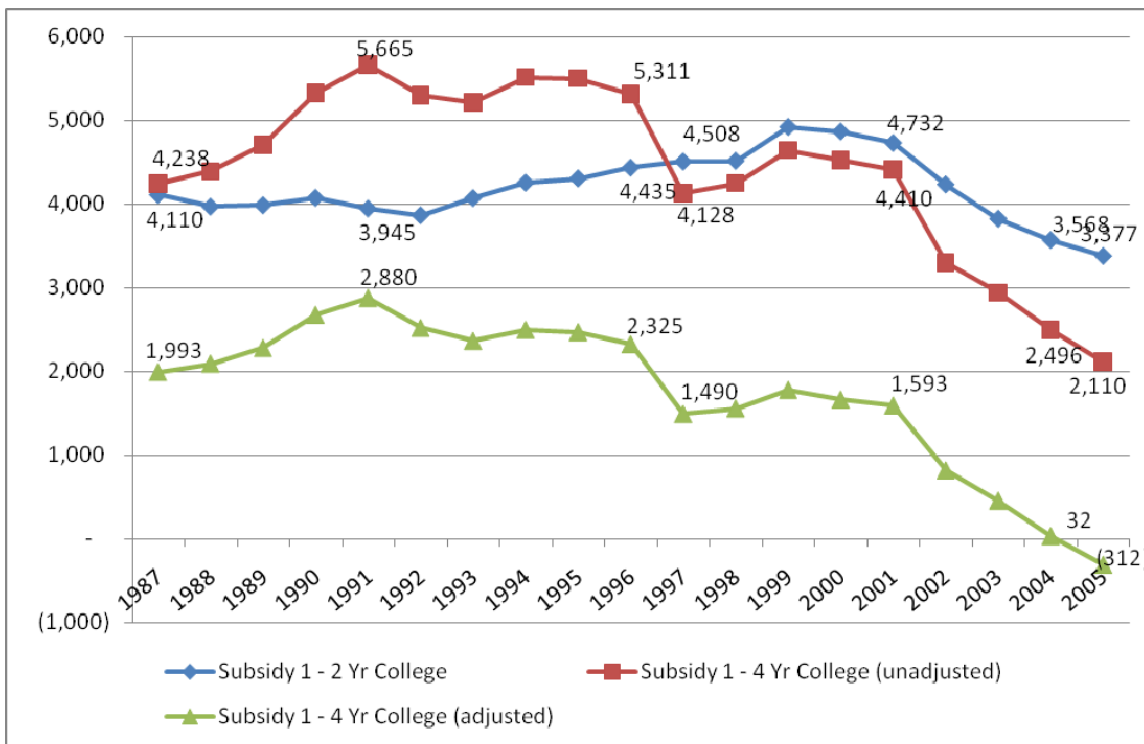
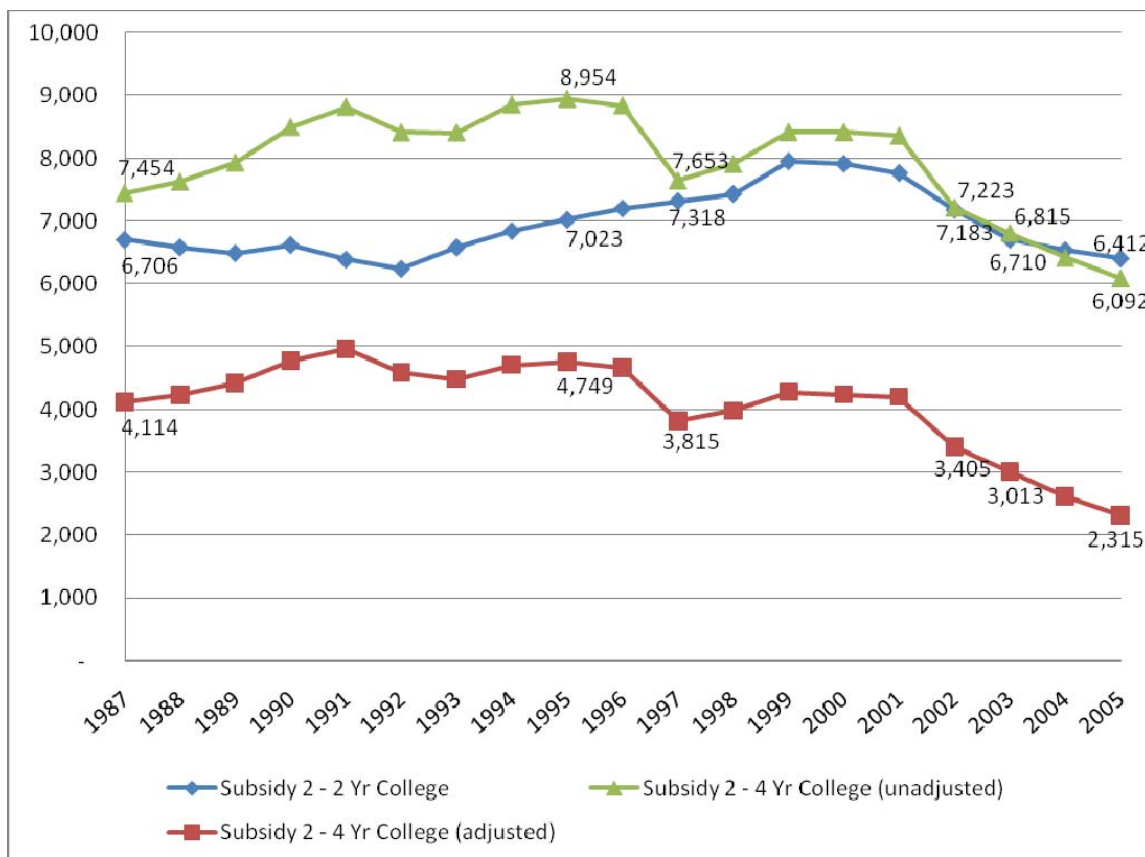


Figure 3 Subsidy-2 Median FTE Public Subsidies for Public Two-Year Colleges and Unadjusted and Adjusted Data for Four-Year Colleges, 1987-2005 (in 2005 dollars)



In summary, our trend analysis shows that, for the 1987-2005 period, the two-year college gets more per FTE student per year, using both the subsidy-1 and the subsidy-2 measures, than the master's level colleges once we adjust the four-year college data for lower-division study only. But, even when we don't adjust the data, we find that both measures of the subsidy show that, by 2004, it was cheaper to support students at the four-year college.

Regional differences

Cost data for the individual states were not available from the Delta Project at the time of this writing but regional differences are revealing. The Delta Project calculation

of costs shows that in all regions of the country the full instructional costs per FTE student (a category we have not used in our paper) is higher for the public master's colleges than for the public community college (They do not separate upper and lower-division study). Although not directly comparable with our cost analysis, their cost trends follow the same pattern. A cursory look at the regional cost and subsidy levels for 2005 also shows that in all regions of the country, were we to adjust the four-year college data for lower division study, the costs and subsidies per FTE would be higher at the public community college than at the public master's level colleges. Some regions are above and others below the national averages that we have calculated but all follow the pattern shown in our analysis

Additional considerations

Our analysis has led us to the conclusion that it may cost quite a bit less to educate a lower division student at a public four-year college than it does at a public community college and that the public subsidy is also less at the four year level owing to both lower costs and higher tuition. In this section we speculate on the possible shortcomings of our research and suggest additional areas of interest not covered by our study.

Capital costs. It is typically assumed that capital costs are higher at the four than the two-year college. This is probably true but very difficult to measure. (The conceptual and practical problems of computing the annual FTE costs of capital are covered in Winston, 1998). Capital costs include the cost of land, buildings and equipment. Students in vocational programs at the community college probably have higher space and equipment costs than history majors in their first two years of college at the four-year level. The capital cost allocation for our two- and four-year college comparisons would depend on

the program mix that students are enrolled in and where the student shifts occur. By excluding capital costs from our calculations, we are assuming that they are equal at both levels.

Community colleges. At the community college we might expect the cost per FTE to be lower than at the master's level colleges because full-time faculty teach more classes and their salaries are lower. The difference in both salary and total compensation is about \$10,000 for all ranks combined whether you look at AAUP or NCES data (AAUP, 2008; NCES, 2007). In addition, more than two thirds of the faculty are part-timers at the community college, compared with 28 percent at public four-year colleges, lowering costs even more (U.S. Department of Education, 2004; Phillippe & Sullivan, 2005).

On the other hand, reasons can be found for the expectation of high costs at the community college. It is well documented that the level of academic preparation of students entering the community college is generally lower than that at most four-year colleges. This necessitates the greater use of remedial education which not only raises the student's costs of obtaining a degree but also raises the institutions average costs of instruction, due to the smaller size of the classes that are customary for remedial students and the greater need to offer them student support services.

The program mix at the community college also impacts costs. In our analysis we have considered the average cost of educating students without regard to their program of study. The first two years of vocational and technical programs have higher costs than do humanities and social science programs. At one college in upstate New York, Dellow and Losinger (2004) showed that the cost per credit hour and per degree granted for a student in the health science and technical areas is three to five times higher than it is for a typical

liberal arts student. In the unlikely case of a large number of students being diverted from a social science program at a four-year college into a health science program at a community college, all of the cost advantage we have calculated for the four-year college might disappear. In any case, if a community college, or those in a state system, had a program mix that was weighted toward vocational and technical occupations, then we might expect the cost per FTE to be high. If the colleges were more oriented toward transfer and had fewer expensive vocational programs, average costs would be lower and at some point the cost advantage of the four-year college might disappear.

Four-year colleges. We might expect that the costs of educating freshmen and sophomores to be lower because many introductory level courses have larger classes and some of the teaching might be done by graduate students. But, if this were the case, some of the costs of educating graduate students would have to be put back into the equation which would raise costs beyond those that we have calculated. In addition, some of the research costs would also have to be added back into the cost at the four-year college, since without these costs the graduate students would not attend. This reflects the fact that “undergraduate education is jointly produced with research and graduate education,” making costs difficult to calculate (Breneman and Nelson, 1981, p. 120). If we were able to make these upward cost adjustments it would narrow the difference in costs between the two- and four-year colleges. In addition, by using average tuition revenues for the four-year college, we have masked the policy in many states to charge a higher tuition for upper division and graduate students. The lower tuition paid by lower division undergraduates would raise the public subsidy for these students and again help to narrow the gap between the 2 and 4-year college.

Starting a bachelor's degree at a community college might also raise student costs unless all of the courses taken were transferable toward a four-year degree. Lengthening the time of study at the four-year level would increase the total public subsidy necessary to produce a degree.

So? It is not clear how the additional considerations mentioned above would impact the costs and subsidies that we have calculated and additional research is needed to answer these questions. The unadjusted average costs per FTE shows that the two-year college has some cost advantage. Looking at these figures, researchers can continue to say with some confidence that “costs per student at two-year institutions are significantly lower than costs per student at four-year institutions” (Archibald and Feldman, 2008, p. 279). However, when we adjust the costs figures for lower division students it muddies the water. The cost advantage might shift depending on which students were diverted to either the two- or the four-year college and which programs they were moving to and from. Moreover it would depend on whether the student shifts were between public or private colleges and whether the four-year college was a high cost research institution or, as we have assumed, a lower-cost public institution. Thus, while calculating the exact impact on these student shifts is beyond this paper, we are still led to the conclusion that it is probably not any cheaper for the public purse to educate a student for the first two years of a bachelor's degree at the community college.

Equity. Throughout this paper we have not made any judgments about the appropriate level of costs or subsidies. Even if FTE costs were higher at the community college, funding these colleges might still be justified on the basis of access. Or, since we know that lower income and minority students are more likely to enroll in the community

college, we might argue that this justifies a higher subsidy. Or, if local and state governments want to support higher cost vocational and technical programs at the community college they should expect to pay a higher cost for these programs. In short, there are a number of equity and economic development issues which we did not broach but which are important ingredients in any public policy decision over funding

Outcomes

Critics will remind us that, even if we could show that it costs less to educate students at the two-year college, we must also think about what we are getting for our money. This is an important question with an incomplete answer at this time. The largely polemical arguments of the 1970's and 80's (as examples see Pincus, 1980; Brint and Karabel, 1989) that attending community colleges had a negative effect on educational attainment have been replaced by more rigorous studies as better data have become available. After a review of the evidence, Rouse states that "overall it appears that two-year college's increase educational attainment by an amount equal to four-year colleges" (Rouse, 1998, p. 613). Other recent research shows that educational attainment has been increased by the expansion of the community college and does not divert a significant number of students from their educational goals (Hilmer, 1997; Grubb, 1999). A recent examination of this topic by Leigh and Gill (2003) concluded that "policymakers should not be overly influenced by [the negative] diversion effect arguments in designing the role of community colleges in state-level master plans for higher education" (p. 28).

Despite these studies, a general consensus remains that starting a bachelor's degree at the community college puts the student at a disadvantage. Many researchers would probably still agree with Pascarella's statement that students "are about 15% less likely

to complete a bachelor's degree in the same period of time as similar students who start at four-year colleges and universities" (Pascarella, 1999, p.10). If this is the case, one answer to this problem is to improve the transfer process (see Wellman, 2002 for suggestions). Another might be to convert the community college into a lower cost bachelor's degree producer. At the present time, ten states have permitted their community colleges to offer selected four-year degrees (Townsend, 2009). Whether the expected lower cost at the community colleges would be the result of increased productivity or lower quality is an open question.

Thus, while the question of equal outcomes is still a matter of debate, it is clear that lower out-of-pocket student costs will continue to drive more students toward the community college as their entry point into higher education. Public policy will no doubt follow this flow with the argument that less funding can be provided to the public four-year colleges and that public support for higher education can be reduced by supporting students at the community college level. Our research suggests that this is probably not the case.

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