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# SAVING, WEALTH, PERFORMANCE, AND REVENUES IN US COLLEGES AND UNIVERSITIES

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# ABSTRACT

Data on institutional saving in US higher education have not been available until now, yet they are useful in several ways. They describe how various types of schools are doing financially, and whether their present behavior is sustainable. They complete the picture of sources and uses of revenue for institutions of higher learning, which allows us to pin down the degree to which the charitable mission of these schools is responsible for their income. They describe a limit to aggressive price reductions. And they allow for some projections of what the economic structure of higher education will look like in the future. Financial data for U.S. higher education institutions from the U.S. Department of Education's Integrated Postsecondary Education Data System (IPEDS) are used to compute savings rates for 2109 institutions in 1995-6, and for 1581 institutions for a panel of the years 1986-7, 1990-1, and 1995-6. These data are available as Excel or Stata files.

# Saving, Wealth, Performance, and Revenues in US Colleges and Universities

Gordon C. Winston, Jared C. Carbone, and Laurie C. Hurshman[*]

## I. Introduction

A college (or family or firm) saves when it takes in more than it spends.[1] In higher education, institutional saving data convey a remarkable amount of information.

For an individual school, its saving describes:

- "The bottom line," a performance measure very much like profit in a familiar business firm. Positive saving describes a good year, behavior that's sustainable under the circumstances; negative saving describes a bad year, behavior that's not.
- Slack, breathing space, or vulnerability: how much the school's spending can rise without an increase in net tuition or how much tuition could be bid down by competition without having to reduce current costs and quality.
- Future wealth, hence future non-tuition income, hence growth or repositioning in the pecking order with better students and faculty and educational quality.

For all schools taken together, institutional saving describes:

- Changes in the future economic structure of higher education – who's getting ahead and who's falling behind and how that's changing the market.

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- The last step in a full – global – accounting of sources and uses of funds in higher education, one that reveals, finally, what part of higher education's revenues are generated by its commercial aspect through sales revenues and what part by its role as a charity through donations – how much is church and how much car dealer.
- The structure of competitive prices in a market where firms engage, simultaneously, in both commerce and charity but in very different degrees among them.
- The distribution among schools of current wellbeing or competitive pressures – which schools of what kind are under the gun.
- Whether disparities in wealth among schools – with all they imply about the concentration of student and faculty quality (Hoxby and Terry 1999, Frank and Cook 1995) – are increasing or decreasing (Winston forthcoming).

But until recently, it's been next to impossible to generate data on the saving being done by colleges and universities. In national financial (IPEDS) data[2], important parts of colleges' revenues are missing – some of gifts and returns on financial assets – so even with reasonable spending numbers, estimates of saving for higher education couldn't be got by that direct route. At the same time, at the individual school level, the use of fund accounting in their financial reports made it at least a two-week chore to tease out its income and spending figures so studies of schools' saving were costly and therefore rare.[3]

[1] For a more considered description of college saving, see Appendix A.
[2] The US Department of Education's Integrated Postsecondary Educational Data System.
[3] Weber and Winston (1994) and, later, Rosenblum and Winston (2001) analyze the saving performance of Williams, Amherst, Swarthmore, and Wellesley.

Three things have changed. First, in the private sector, new accounting standards require that colleges and universities report a single line for the institution as a whole showing the year's saving – it's simply the year's change in net wealth. Second, using the national IPEDS data, we have managed to work backward to calculate saving indirectly from the difference in a school's wealth at the beginning and end of the year using the identity of saving and changes in wealth. Those are the estimates of saving for US higher education reported here. Finally, the "cost-price-subsidy-hierarchy" analysis of higher education (Winston 1999) has shown the central role of institutional wealth in determining student subsidies and hence student and faculty selectivity and quality – a school's place in the educational hierarchy – so it has become more urgent to understand saving behavior because it describes how such wealth is built, how it is being distributed, and how that distribution is changing. This urgency is increased by truly stunning increases in endowment wealth (much of saving) at the wealthiest colleges and universities at the end of the 90's: in 1999-00, Harvard $5 billion, Williams $500 million, Cornell $750, Carleton $135, Princeton $2 billion, Yale, $3 billion (The Chronicle of Higher Education 2000).

In the private sector, wealth provides a major part of the non-tuition resources that allow a school to subsidize its students – to sell them a costly education at a modest price. And the greater the wealth, the larger that student subsidy can be, the larger the gap between cost and price. In elite public sector schools, appropriations support similar student subsidies with similar effects on selectivity and quality. Putting public and private sectors together, the most recent national data (for 1996) show that the average

student at a US college or university got a yearly subsidy of $9,000 (Winston and Yen 1995, updated with 1995-6 data) – she paid $4,000 for a $13,000 education – and that the difference in subsidies between the public and private sectors was negligible – the average school's subsidy was $8,999 in the public sector and $9,033 in the private sector.[4] But though averages may be much the same between sectors, student subsidies are very very different among schools – subsidies range from $2,053 in the bottom decile of private schools to $25,017 in the top. This subsidy hierarchy, in turn, translates into a hierarchy of student, faculty, and institutional quality (Winston 1999).[5]

In this paper, then, we will present estimates of institutional saving in US higher education, first for the year 1995-6, and then, to give a broader context and a sense of trends, for a smaller panel of schools that allows estimates for 1986-7, 1990-1, and 1995-6. Emphasis will be on the level and variety of saving among schools – on its concentration or dispersion. So the significance of differential saving rates will be suggested by reporting a 30 year simulation of existing wealth disparities and their concomitants – what present saving patterns will do, if maintained for thirty years, to the shape and structure of US higher education.

## II. Income, Saving, and the Growth of Wealth

[4] This population is slightly different from that in Winston and Yen (1995), because not all schools for which we had subsidy data provided the information needed to compute saving. Thus, the subsidy numbers given in Winston and Yen do not match those in this paper exactly, but the change is not significant.

[5] A caveat: while educational spending and quality aren't the same thing, they are highly correlated – in the words of Nobel Laureate Val Fitch, "Excellence can't be bought, but it must be paid for" (Inside Carleton, 1997).

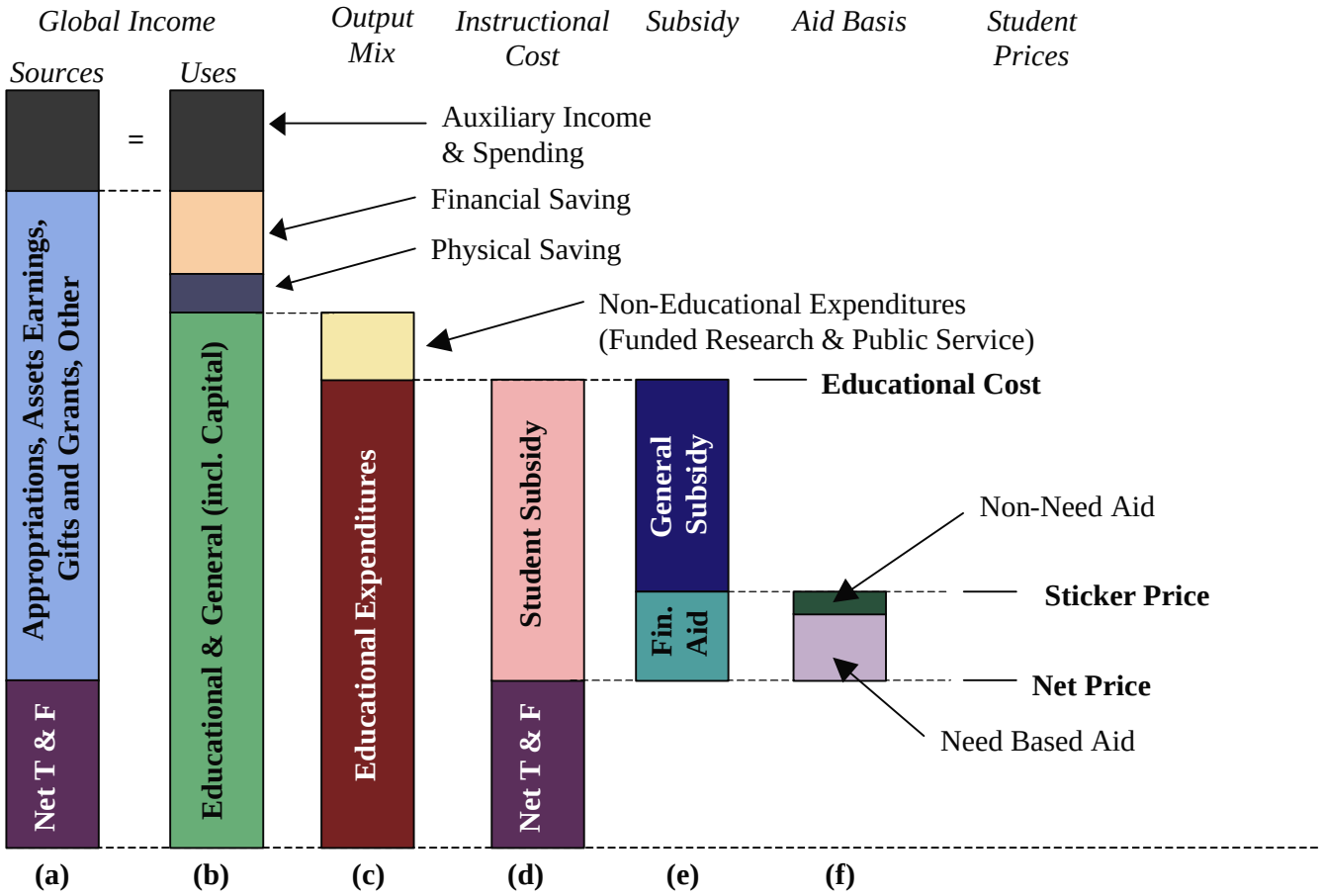
There are some simple relationships – related tautologies, really – central to the role that saving plays in the economics of colleges that are usefully established at the outset. One defines the way saving fits into the structure of a college's income, spending, and subsidy flows in any year. Another describes the relentless – even mechanical – effect that one year's saving has on the next year's wealth. A third describes the feedback, over time, of saving on wealth on saving on wealth on… Since much of this economic structure is so different from that of familiar business firms, it needs spelling out.

A college is a firm that acts simultaneously like a car dealer and a church – it sells its product but does so at charitably subsidized prices that don't nearly cover production costs. It's a "donative-commercial nonprofit firm."[6] This strange and unfamiliar economic structure is summarized in Figure 1, a simple picture of the sources and uses of its funds.[7] (The magnitudes represented are expressed per student FTE and are roughly appropriate to the average US school in 1996.) The height of the first bar, (a), describes

[6] In Henry Hansmann's phrase (1980).
[7] "Funds" are to be interpreted broadly to include all economic resources including the value of capital services from owned capital stocks, not just money flows. See Winston and Yen 1995.

Figure 1

**Global Income, Costs, Prices, Subsidies, & Aid per FTE Student**



the sources of funds, the college's total yearly income that includes net tuition revenues, gifts, appropriations, and total returns on the school's net assets, financial and physical – broadly, commercial sales revenues and revenues from charitable donations, past and present. The second bar, (b), shows the uses of those funds. Only two need be distinguished for present purposes, the current cost of producing the year's education (including capital service costs) and saving. It is useful to indicate, too, the two forms that saving can take – as net financial or physical capital investments. By definition, sources equal uses. Again, the magnitudes in Figure 1 are consistent with the 1996 national averages. An equivalent picture of a for-profit firm would show that price in column (a) was greater than cost in column (b) leaving a profit as their difference. Then the next four bars would be irrelevant.

The remaining bars in Figure 1 embed much of the uniqueness of a college as a firm: column (c) recognizes the non-educational activities that are important to some schools; column (d) shows educational production cost and the fact that only a (small) part is covered by the price the customer pays (net tuition); column (e) breaks the resulting student subsidy into individual financial aid and a general subsidy that's given to all students by a sticker price set below cost; finally, column (f) breaks down the financial aid portion of subsidy into need-based and merit aid components. The magnitudes of this need- and merit-aid breakdown were based on a study by McPherson and Schapiro (1994).

So the first two columns of Figure 1 frame the year's saving: income that is not used to cover production costs during the year is saved in the form of increased net financial or physical capital wealth. It's important, of course, that a school can *dis*save, too, spending more than it takes in during the year by reducing net wealth – liquidating assets or increasing debt.

This relationship between flows and stocks rests on the second useful tautology: a year's saving causes an equal change in net wealth from beginning to end of year. If a college saves $7 million during the year, that $7 million must show up as an increase in financial or physical assets, as a reduction in liabilities, or both.[8] Conversely, any change in a college's net wealth can only be the result of its saving or dissaving. It is this arithmetic correlation between stocks and flows, net wealth and saving, that allowed us to generate saving estimates – income less spending – from IPEDS data that don't report all of a college's income. Since any change in wealth can only be due to saving, we back into educational saving estimates for a year (a flow) through a comparison of schools' wealth at beginning and end of that year (stocks). Both the logic and the methodology are given in more detail in the Appendix.

The final relationship important to the economic role of saving is a dynamic feedback. As saving increases wealth, it increases future asset income, *cet. par.*, which supports increased future spending or saving or both. This, of course, is how the rich get richer. And since all this plays out in a hierarchy of schools where wealth goes far to

[8] The accumulated deferred maintenance that allows the value of physical plant to fall below its replacement value is, in all respects, analogous to a financial liability (Winston 1993 "The Capital...").

determine position and position determines a school's access to student and faculty quality, the importance of institutional saving is clear; schools that save a lot, relative to others, will move up in the hierarchy; those that don't will move down. To the extent that differences in saving are correlated with current wealth, existing disparities between rich and poor schools will be increased – the economic structure of higher education will become more unequal (Winston forthcoming). So differences in institutional saving can contribute to the increasing concentration of the best students among the high-subsidy schools identified by Hoxby and Terry (1999) and by Cook and Frank (1995).

## III. The Data

2109 colleges and universities – out of roughly 3400 in total – reported financial data to IPEDS in sufficient detail that we could calculate their 1996 saving. Of these, 1170 were public institutions and 939 were private.[9] For a subset of those schools, their data allowed saving estimates, too, for 1986-7 and 1990-1 forming a panel of 1581 whose saving estimates spanned the decade. In what follows, we will first concentrate on the 1995-6 population, then note the modifications suggested by the panel data. To anticipate, in general we can say that the larger 1996 population gives much the same information as the panel but in usefully exaggerated form – 1996 was a year of extremes.

[9] This population is somewhat smaller than that used to generate the student subsidy and physical capital estimates for US higher education that have been reported previously (Winston and Yen 1995, Winston and Lewis 1997) but it reflects the same broad characteristics both by type and control and by subsidy hierarchy.

Three points important to interpreting these data need to be made. One concerns the form that saving takes – whether it increases financial or physical wealth. Others concern the appropriate way to get comparable measures of schools' saving with the complications of multi-product universities of different size. Finally, we touch briefly on inflation and real saving.

For an individual college or university, there may be little choice in how to utilize its saving: for both private and public institutions, revenues are often specified by donors to be saved, not spent, and further restricted by them to particular uses – gifts or appropriations made available only for increased endowment (financial wealth) or to construct specified buildings (physical wealth). As noted below, such restrictions appear especially relevant to schools in the public sector. Assets, of course, differ markedly in their liquidity with a school's physical assets much less liquid than all but the most illiquid of their financial assets. And, finally, in the short run saving allocations will reflect the fact that it takes more planning time, typically, to invest in physical than in financial assets so yearly variations in saving tend to be absorbed initially by changes in financial wealth and show up as changes in physical wealth only with a lag. These differences have made it important to distinguish between financial and physical saving in what follows.

To make saving estimates among different size schools comparable requires that the data be expressed per student FTE. That is done throughout in the results reported below. Another requirement for comparability recognizes that while all schools in the population

have students and produce education, some are relatively simple, producing only undergraduate education, while others are multi-product universities making a lot of things that have little to do with education. So the saving estimates reported here are adjusted to reflect only schools' educational activities – the distribution of each school's costs between its educational and non-educational activities was used to allocate an appropriate portion of its total saving to its educational activities.[10] So only saving relevant to educational activities is reported here. Finally, the saving data report real saving that recognizes the erosion of financial wealth from any inflation in prices during the year.[11]

## IV. Saving by Colleges and Universities, 1996

Certainly, the most fundamental fact in Table 1 is that US colleges and universities saved a very great deal in 1996. On the basis of these schools, we can estimate that educational saving in all of US higher education was roughly $25 billion. Within these data, saving by the average school in its educational activities was just over $7 million and the year's saving for the average student, $2,500. By form, financial saving dominated, overall, with nearly 70% of the total, but that distribution was very different between sectors. Keep in mind that all figures describe saving associated with schools' educational function only.

[10] This is the procedure used by DucLeTo and previously adopted in the estimates of both subsidies (Winston and Yen 1995) and capital stocks and capital service flows (Winston and Lewis 1997).
[11] Were replacement values of physical assets done with precision at both beginning and end of year, they too would have to be adjusted for the year's inflation.

Table 1

# Institutional Saving and Performance, 1996

*in 1996 dollars per FTE student*

| | | *Saving* | | | *Saving Distribution* | | *Economic Performance* | |
|---|---|---|---|---|---|---|---|---|
| | N | Total | Financial | Physical | Financial % of Total | Physical % of Total | % of Schools with Negative Saving | Saving as % Total Resources |
| | *(1)* | *(2)* | *(3)* | *(4)* | *(5)* | *(6)* | *(7)* | *(8)* |
| **All Institutions** | 2109 | $2,475 | $1,710 | $765 | 69% | 31% | 18% | 16% |
| **All Public** | 1170 | $683 | $114 | $568 | 17% | 83% | 21% | 6% |
| **All Private** | 939 | $4,708 | $3,699 | $1,009 | 79% | 21% | 14% | 22% |
| ***By Carnegie Type*** | | | | | | | | |
| Public Institutions | | | | | | | | |
| Research I | 46 | $1,445 | $597 | $847 | 41% | 59% | 9% | 9% |
| Research II | 22 | $1,234 | $556 | $678 | 45% | 55% | 5% | 9% |
| Doctoral | 59 | $980 | $279 | $701 | 29% | 71% | 7% | 8% |
| Comprehensive | 242 | $1,130 | $208 | $923 | 18% | 82% | 14% | 10% |
| Liberal Arts I | 6 | $1,542 | $668 | $874 | 43% | 57% | 33% | 11% |
| Liberal Arts II | 60 | $418 | -$10 | $429 | -2% | 102% | 23% | 4% |
| Two Year | 709 | $356 | -$19 | $375 | -5% | 105% | 25% | 4% |
| Private Institutions | | | | | | | | |
| Research I | 21 | $11,291 | $9,416 | $1,874 | 83% | 17% | 0% | 23% |
| Research II | 9 | $6,238 | $5,403 | $835 | 87% | 13% | 11% | 22% |
| Doctoral | 36 | $4,534 | $4,201 | $333 | 93% | 7% | 17% | 19% |
| Comprehensive | 200 | $2,804 | $1,933 | $871 | 69% | 31% | 9% | 17% |
| Liberal Arts I | 138 | $11,533 | $9,553 | $1,980 | 83% | 17% | 6% | 32% |
| Liberal Arts II | 297 | $3,292 | $2,362 | $930 | 72% | 28% | 17% | 19% |
| Two Year | 96 | $2,326 | $1,772 | $555 | 76% | 24% | 20% | 16% |
| ***By Subsidy Decile*** | | | | | | | | |
| Public Institutions | | | | | | | | |
| Decile 1 | 117 | $1,561 | $399 | $1,162 | 26% | 74% | 19% | 6% |
| Decile 2 | 117 | $1,192 | $328 | $865 | 27% | 73% | 20% | 9% |
| Decile 3 | 117 | $1,019 | $237 | $782 | 23% | 77% | 20% | 8% |
| Decile 4 | 117 | $517 | $116 | $401 | 22% | 78% | 28% | 5% |
| Decile 5 | 117 | $650 | $128 | $522 | 20% | 80% | 16% | 6% |
| Decile 6 | 117 | $517 | $153 | $364 | 30% | 70% | 21% | 6% |
| Decile 7 | 117 | $257 | -$145 | $402 | -57% | 157% | 19% | 3% |
| Decile 8 | 117 | $304 | -$59 | $363 | -19% | 119% | 28% | 4% |
| Decile 9 | 117 | $353 | -$126 | $479 | -36% | 136% | 16% | 5% |
| Decile 10 | 117 | $455 | $111 | $345 | 24% | 76% | 19% | 7% |
| Private Institutions | | | | | | | | |
| Decile 1 | 94 | $16,703 | $14,857 | $1,846 | 89% | 11% | 14% | 33% |
| Decile 2 | 94 | $7,670 | $6,311 | $1,359 | 82% | 18% | 9% | 26% |
| Decile 3 | 94 | $5,514 | $3,995 | $1,519 | 72% | 28% | 9% | 23% |
| Decile 4 | 94 | $2,449 | $1,754 | $695 | 72% | 28% | 14% | 13% |
| Decile 5 | 94 | $3,165 | $2,363 | $803 | 75% | 25% | 12% | 18% |
| Decile 6 | 94 | $2,787 | $2,056 | $731 | 74% | 26% | 19% | 17% |
| Decile 7 | 94 | $3,188 | $2,127 | $1,062 | 67% | 33% | 12% | 19% |
| Decile 8 | 94 | $2,193 | $1,296 | $898 | 59% | 41% | 16% | 16% |
| Decile 9 | 94 | $2,077 | $1,440 | $637 | 69% | 31% | 11% | 16% |
| Decile 10 | 93 | $1,300 | $762 | $538 | 59% | 41% | 18% | 13% |

Data from 1995-6 IPEDS Survey.

The next two lines of Table 1 reveal significant but not surprising differences between public and private sector schools in their saving and the form it took. Average saving in the public sector was $683 per student of which only 17% or $114 added to new financial wealth leaving the other 83% – $568 per student – as additions to physical capital. In the private sector, in contrast, average saving per student was not only much greater – at $4,708 – but 79% of that, or $3,699, took the form of new financial wealth: $1,009 or 21% was new net physical capital.

These differences between sectors reflect the fundamental differences in financing noted earlier. For schools in the private sector, saving and wealth act in familiar ways: financial wealth provides both insurance against contingencies and asset earnings that support student subsidies. So a private school's wealth is its primary source of both financial security and position in the hierarchy. In both sectors, wealth in the form of physical capital provides the essential and costly flow of capital services in educational production – about 1/4 of total educational costs (Winston and Lewis 1997).

Schools in the public sector, in contrast, rely on appropriations from taxpayers' resources for primary support of their non-tuition income and the student subsidies it allows. The primary educational cost that these schools cover from their own wealth is that of physical capital services. So the average public institution has 83% of its total wealth in the form of physical capital and only 17% in financial wealth. It relies on appropriations both for student subsidy resources and for physical capital investments – for the things, in other words, that a private school has to provide from its own

accumulated wealth and saving. Financial saving plays a much less central role in public institutions than in private.

The very different behaviors in public and private sectors in Table 1, therefore, reflect very different roles for institutional saving and wealth: average saving in the private sector is nearly seven times that in the public sector and the form that saving takes is reversed between them – roughly 80% of public sector saving is in the form of increased physical wealth while 80% of private sector saving is in increased financial wealth.

The top section of detail in Table 1 reports, for public and private sectors separately, average saving by schools grouped by Carnegie type.[12] Clearly, very different levels of per-student saving are achieved in different types of schools, aside from the general public-private sector differences. Over the whole of the population, from the highest level of saving, $11,533 per student at Private Liberal Arts I schools to the lowest, $356 at Public Two-Year schools – the difference is a factor of 32. Variations in saving within each sector are not so great, but they aren't trivial, either: the Liberal Arts I schools at the top of the private sector save, on average, five times as much as the Private Two-Year schools at the bottom and the Public Research I universities save four times as much as the Public Two-Year schools.

These differences become more stark in the bottom section of Table 1 where the data are organized, within each sector, according to the size of the subsidies schools give their

[12] The small numbers of Public Liberal Arts I and Private Research II schools suggests that their data be interpreted with particular caution.

students – by how much the price a student pays falls short of the full cost of his education. While it's not surprising that per-student saving is highly correlated with subsidy ranking, the magnitude of differences in average saving may be unexpected – that over the whole of the population, the highest saving schools – the average Private schools in the top decile – saved fully sixty-five times as much per student as the average public schools in the seventh decile.

## V. Implications

### A. Performance:

A school's saving was described in the introduction as an effective indicator of its economic performance playing somewhat the same role for a college that profits play for a for-profit firm – a sort of "bottom line." The school with positive saving had a good year; the school with negative saving did not: positive saving describes sustainable behavior; negative saving does not. What's more, how much a school saved is at least a partial measure of its breathing space – how near or far the wolf is from the door. So both sign and magnitude of saving are indicators of a school's economic performance for the year.

The seventh column of Table 1 reports how many schools in each segment will get into trouble if neither their economic circumstances nor behavior changes – what proportion of each population saw their wealth reduced during the year. Of course, it's important that a single year's performance, even if it is significantly unsustainable

because it generates large negative saving, holds little threat for a school whose wealth (or government backing) provides an ample buffer giving it plenty of time to change that behavior.[13]

Once again, these figures reflect the deep difference in the role that saving plays in public and private sectors. Overall, 18% of the schools in this population had negative saving in 1996[14], but far more public (21%) than private (14%) schools fell below that line. Since public institutions derive a major part of their support from government, of course, they can responsibly play it closer to the line, risking negative saving in any year. The differences by Carnegie type within public and private sectors seem to be both significant and unsurprising. Very few Public Research or Doctoral Universities were over the line into negative saving while about a quarter of Public Two-year and Liberal Arts colleges were. In the private sector, very few schools in the segments dominated by wealthy schools – Research I Universities and Liberal Arts I Colleges – had negative saving (0% and 6%, respectively) while many more Private Liberal Arts II and Two-Year Colleges failed to break even (17% and 20%). Organized by student subsidy, no clear pattern emerges in the Public Sector while a mild trend is evident among private schools with a higher proportion of the poorer, low-subsidy schools showing potential financial problems. If anything is unexpected about these results, it is the absence of stronger patterns.

[13] For an individual school, its net financial worth (relatively liquid wealth) divided by its negative saving would describe how long it could keep on that same tack – a measure akin to the 'burn rate' of cash so important recently to start-up internet companies and their demise.

[14] The average amount of negative saving for these schools was $1,780 per fte student. Their average wealth was $25,000 per student as compared to the overall population average of $33,000, so poorer schools have a stronger tendency to dis-save – and they are the ones who can least afford it.

While the existence or absence of saving – positive or negative saving – is the bright line in a college's performance evaluation, we've noted that measures that capture magnitudes, too, are suggested by the parallel between colleges' saving and firms' profits so there's an important difference between larger and smaller saving. The obvious measure to borrow from an ordinary firm would be saving as a percent of sales revenues. But, of course, college sales – tuition – revenues are so small a part of either its total income or the value of its production – so much is covered by non-sales donations (a subject to which we return again with more information below) – that the appropriate denominator with which to judge magnitudes here has to be a college's total revenues, including both sales and charitable income. For a competitive for-profit firm in equilibrium there are, of course, no donations so total revenues and sales revenues come to the same thing.

Col. 8 in Table 1 shows the magnitude of the year's saving relative to colleges' total revenues, the distance between their current performance and the unsustainable performance represented by negative saving – breathing space or slack.

Except for the two types of public sector schools that have very low absolute levels – Liberal Arts II and Two Year Colleges – saving in that sector is close to proportional to revenues, at right around ten percent. Within the Private sector, in contrast, schools range from saving 16% and 17% of their total revenues where saving is the most meager in both absolute and relative terms (Two-Year and Comprehensive Universities) to saving

23% and 32% for those with the largest saving (Liberal Arts I Colleges and Research I Universities). When ordered by the size of their student subsidies, public sector schools show strong differences in sheer dollar amounts of saving – those with the largest student subsidies do the most saving per student – but that doesn't get reflected in the proportions of total revenues saved where the pattern is much weaker. Among private sector schools, those with the highest subsidies not only save the most dollars per student, but they also save the largest proportion of their total revenues.

Again, there's nothing very surprising about the fact that more ample saving by the wealthy and well supported schools gives them more breathing space – more slack – than poorer schools get. Nor is it surprising, given the very different roles played by saving in public and private sectors, that both levels of saving and differences among schools are greater in the private sector.[15] Indeed, in general, these data generate few surprises. That could be disappointing – nothing new; didn't learn much – or it could be reassuring – the basic saving estimates appear to make good intuitive sense so we can use them with some confidence. So use them, we do.

B. Saving, Growth, and Disparities

While we might push the parallel of savings and business profits one more step to talk about saving relative to physical and financial wealth as another reasonable measure of performance – a sort of "rate of return on invested capital" – that relationship appears to

[15] The coefficient of variation on saving among schools is 3.55 in the public sector and 2.22 in the private sector.

be much more significant for a college (with its non-distribution constraint) as an indication of the rate of *growth* of its wealth and all that implies. Again, recognizing the difference between public and private sector schools that makes saving so much more central to the latter, the future of a private school is heavily dependent on its current saving.

To repeat the now-familiar sequence once again, in a private sector school, wealth (physical and financial) supports student subsidies that, in turn, generate student demand which is turned into excess demand by restricted supply allowing more selective admission on student quality (Winston 1999). Peer effects amplify the effect of student quality on educational quality, demand, selectivity, and student quality. But for an individual school, all this plays out within a *hierarchy* of competing schools that give (primarily because of differences in their wealth) very different student subsidies. With a limited supply of student quality, the market is essentially positional with any school's access to student quality dependent largely on its relative ability to offer student subsidies and exploit peer effects – its position in the hierarchy. With wealth a defining aspect of position within the private sector, saving becomes the route to improvement – to the target of 'excellence' embedded in virtually all collegiate mission statements and most trustees' board rooms.

So for the individual school in the private sector, sustained saving yields very desirable results. If that school saves more than competing schools, it gains the ability to support larger student subsidies in the future, to replace those schools in the pecking

order and wind up with better students, faculty, and facilities to show for it. Of course, there's a tough intertemporal decision to be made in the school's choice between reducing current saving to increase current spending or lower current price – thereby increasing current subsidy and current student demand – or, alternatively, increasing saving by sacrificing current subsidies in order to be able to pay larger subsidies in the future. Bigger subsidies and better competitive position now or in the future? Subsidies or saving? And the success or failure of the decision will depend not only, or primarily, on that one school's decision, but on what its competitors do, too – the ultimate test of its decision will be the effect it has on its *relative* wealth and subsidies. It is, at base, in a positional arms race (Winston 2000). The school in the public sector will face the same hierarchical pressures for excellence in the market, but the source of its non-tuition resources will be the government support that does not flow from its own institutional saving. The public sector institution that does well in the hierarchy will have its faculty, students and facilities well supported by generous appropriations.[16]

All of that deals with the individual school and its own incentives to save in order to move ahead of its competitors.

But attention to the whole structure of higher education raises a different and also socially important question about institutional saving and its effect on the distribution of future wealth. If it's the currently wealthiest schools that have the highest saving rates, there will be increased differentiation among schools in the future – the rich will have

[16] Note that an internal reallocation of subsidies in a large public sector school can concentrate resources in an "enclave" honors college that mimics better-endowed schools but at the expense of their other students.

gotten richer, and wealth disparities among institutions – with consequent disparities in costs, prices, subsidies and quality – will have increased.

This issue of growing wealth disparities was addressed in a recent paper that used a panel of saving data for 1986-7, 1990-1, and 1995-6 (Winston forthcoming). We report on this panel in more detail later in the paper; for now, let's take a brief look at the results relevant to disparities.

Table 2

## Distribution of Present and Future Resources in US Higher Education

*Schools ranked by subsidy*

| | | Subsidy | | | | Wealth | |
|---|---|---|---|---|---|---|---|
| | Current Savings | Current | In 10 Years | In 20 Years | In 30 Years | Current | In 30 Years |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Bottom 20% | 11% | 11% | 11% | 11% | 11% | 10% | 11% |
| Top 20% | 49% | 34% | 36% | 37% | 39% | 47% | 49% |
| Top 5% | 28% | 13% | 14% | 16% | 18% | 26% | 27% |
| Top 1% | 11% | 4% | 5% | 5% | 6% | 9% | 11% |
| Gini coefficient | 0.8048 | 0.2379 | 0.2593 | 0.3000 | 0.3557 | 0.5190 | 0.6865 |
| Public | 0.8007 | 0.1739 | 0.1793 | 0.1950 | 0.2220 | 0.3557 | 0.5831 |
| Private | 0.7061 | 0.3024 | 0.3263 | 0.3962 | 0.4221 | 0.4984 | 0.6200 |

Table 2 summarizes what emerged. The bottom 20% of schools, ranked by the size of their student subsidies, did a bit over 11% of the total saving. At the other end, the top 20% of the schools did nearly 50% of total saving. Narrowing that top group further, the top 5% did 28% of saving while the top 1% did more than 11%. Gini coefficients that measure the degree of distributional inequality (higher values (between zero and one)

describing greater inequality) show that savings were highly concentrated and the data on their distribution show that they were highly concentrated among schools with already-large student subsidies. The next four columns of Table 2 show the results of a simple simulation that asked what the distribution of future student subsidies would look like if savings were continued in the same pattern for ten, twenty, and thirty years. The result is a consistent increase in disparities measured by steadily increasing Gini coefficients on the distribution of subsidies. The last two columns show the effect of compound growth as saving augments wealth, augmenting income and saving and growth… Projected thirty years out, the current distribution of saving among schools would create a distribution of wealth and subsidies significantly more unequal than at present.

C. Completing a Global Accounting – Sources and Uses, Churches and Car Dealers

Returning to the larger 1996 population, it is probably surprising that the most useful result from deriving estimates of schools' saving may not be directly related to their saving, *per se*, but instead to the fact that saving estimates make it possible, finally, to close the circle on a full 'global' accounting of colleges and therefore the economics of higher education – to complete estimates for the taxonomy of Figure 1.[17] For years, economic reporting by colleges and universities adhered to the rules of "fund accounting" that effectively divided each school's economic activities into seven or so separate funds, each one treated as a separate little firm with lending and borrowing and transfers between them and no recognition of capital service costs. The result was an incomplete

[17] At the risk of repetition, these estimates all reflect only the educational activities of colleges and universities. Were there reason to be inclusive, it could easily be done.

and even incoherent economic reporting that made it very difficult to get a whole picture of a school's economic activities. IPEDS financial data were collected in the same spirit with only a partial reporting of income (Winston 1992).

So Figure 1 with its complete accounting of economic flows in a college or university has stood as a very useful conceptual framework, but one that couldn't be filled in with estimated magnitudes in some of the most fundamental of its blanks. We have been able to create a usefully rich description of the economics of a college that included capital service costs and the imputed income of owned capital stocks and prices net of discounts and one that recognized non-educational activities. But we weren't able to put an accurate estimate on the income blank – the sources of funds – because IPEDS data didn't report all of donative income.

So long as there was missing information on revenues and saving, we couldn't know the height of either the first or the second bar in Figure 1. We've had all the information we've needed on net tuition and fees (commercial revenues) on the bottom of the first bar and everything we needed on costs at the bottom of the second, but we couldn't estimate saving in a direct way as the difference between total income and expenditures because part of income was missing. Now, though, the necessary identity of sources and uses of funds – that the first two bars have to have the same height – means that now that we can measure saving, we can derive the non-commercial component of income as the difference between uses (expenditures and saving) and net tuition income.

Table 3

# Sources and Uses of Educational Revenues in US Higher Education, 1996

## Sales, Donations, Expenditures, and Saving

*in 1996 dollars per FTE student*

| | Number of Schools | Educational Revenues per FTE student | | | | | Student Subsidies | Price-Cost Ratio |
|---|---|---|---|---|---|---|---|---|
| | | Total | Sources | | Uses | | | |
| | | | Commercial: Net Tuition | Charitable: Donations | Production Costs | Saving | | |
| | N | | $p_n$ | δ | c | v | $c-p_n$ | $p_n/c$ |
| **All Institutions** | 2109 | $15,487 | $3,998 | $11,489 | $13,012 | $2,475 | $9,014 | 31% |
| **All Public** | 1170 | $11,082 | $1,400 | $9,681 | $10,399 | $683 | $8,999 | 13% |
| **All Private** | 939 | $20,976 | $7,235 | $13,741 | $16,268 | $4,708 | $9,033 | 44% |
| ***By Carnegie Type*** | | | | | | | | |
| Public Institutions | | | | | | | | |
| Research I | 46 | $15,389 | $3,379 | $12,010 | $13,944 | $1,445 | $10,565 | 24% |
| Research II | 22 | $13,425 | $3,302 | $10,123 | $12,191 | $1,234 | $8,889 | 27% |
| Doctoral | 59 | $12,746 | $2,871 | $9,875 | $11,766 | $980 | $8,895 | 24% |
| Comprehensive | 242 | $11,742 | $1,933 | $9,809 | $10,612 | $1,130 | $8,679 | 18% |
| Liberal Arts I | 6 | $14,753 | $2,543 | $12,209 | $13,210 | $1,542 | $10,667 | 19% |
| Liberal Arts II | 60 | $10,037 | $1,778 | $8,259 | $9,619 | $418 | $7,840 | 18% |
| Two Year | 709 | $8,973 | $820 | $8,152 | $8,617 | $356 | $7,797 | 10% |
| Private Institutions | | | | | | | | |
| Research I | 21 | $48,883 | $13,307 | $35,576 | $37,592 | $11,291 | $24,285 | 35% |
| Research II | 9 | $28,158 | $9,982 | $18,177 | $21,920 | $6,238 | $11,939 | 46% |
| Doctoral | 36 | $24,215 | $11,305 | $12,909 | $19,681 | $4,534 | $8,376 | 57% |
| Comprehensive | 200 | $16,542 | $7,819 | $8,723 | $13,738 | $2,804 | $5,919 | 57% |
| Liberal Arts I | 138 | $35,609 | $9,692 | $25,917 | $24,077 | $11,533 | $14,384 | 40% |
| Liberal Arts II | 297 | $17,123 | $5,646 | $11,477 | $13,831 | $3,292 | $8,185 | 41% |
| Two Year | 96 | $14,362 | $5,106 | $9,256 | $12,035 | $2,326 | $6,929 | 42% |
| ***By Subsidy Decile*** | | | | | | | | |
| Public Institutions | | | | | | | | |
| Decile 1 | 117 | $25,189 | $1,933 | $23,255 | $23,628 | $1,561 | $21,695 | 8% |
| Decile 2 | 117 | $13,507 | $1,295 | $12,212 | $12,315 | $1,192 | $11,020 | 11% |
| Decile 3 | 117 | $12,278 | $1,590 | $10,688 | $11,259 | $1,019 | $9,669 | 14% |
| Decile 4 | 117 | $10,518 | $1,258 | $9,260 | $10,000 | $517 | $8,742 | 13% |
| Decile 5 | 117 | $10,115 | $1,378 | $8,737 | $9,465 | $650 | $8,087 | 15% |
| Decile 6 | 117 | $8,970 | $996 | $7,974 | $8,454 | $517 | $7,457 | 12% |
| Decile 7 | 117 | $8,577 | $1,431 | $7,146 | $8,320 | $257 | $6,889 | 17% |
| Decile 8 | 117 | $7,879 | $1,293 | $6,586 | $7,575 | $304 | $6,281 | 17% |
| Decile 9 | 117 | $7,332 | $1,350 | $5,982 | $6,980 | $353 | $5,630 | 19% |
| Decile 10 | 117 | $6,455 | $1,481 | $4,974 | $6,000 | $455 | $4,519 | 25% |
| Private Institutions | | | | | | | | |
| Decile 1 | 94 | $50,674 | $8,954 | $41,721 | $33,971 | $16,703 | $25,017 | 26% |
| Decile 2 | 94 | $29,353 | $7,811 | $21,542 | $21,683 | $7,670 | $13,872 | 36% |
| Decile 3 | 94 | $23,813 | $7,241 | $16,572 | $18,299 | $5,514 | $11,058 | 40% |
| Decile 4 | 94 | $18,234 | $6,526 | $11,709 | $15,785 | $2,449 | $9,260 | 41% |
| Decile 5 | 94 | $17,894 | $6,756 | $11,138 | $14,728 | $3,165 | $7,973 | 46% |
| Decile 6 | 94 | $15,927 | $6,309 | $9,618 | $13,140 | $2,787 | $6,831 | 48% |
| Decile 7 | 94 | $16,596 | $7,567 | $9,029 | $13,407 | $3,188 | $5,841 | 56% |
| Decile 8 | 94 | $14,148 | $7,201 | $6,947 | $11,954 | $2,193 | $4,753 | 60% |
| Decile 9 | 94 | $12,689 | $7,016 | $5,674 | $10,613 | $2,077 | $3,597 | 66% |
| Decile 10 | 93 | $10,318 | $6,965 | $3,353 | $9,018 | $1,300 | $2,053 | 77% |

Notes:

1. "Educational" reflects allocation of educational, non-educational, and joint costs as described in DP-32.

2. "Charitable" includes appropriations, gifts, and asset earnings.

So Table 3 reports a complete global accounting: funds come from commercial (tuition) revenues or charitable donations (broadly defined) and they are used either to support current production or they're saved.[18]

An even more significant fact emerges from the sources and uses of funds reported in Table 3. At the most basic level, the dual nature of colleges and universities as charities and commercial firms, simultaneously, has made it difficult to understand their economics – in many ways they fit the familiar models of for-profit commercial firms with prices and customers and production and demand so the temptation has been great to treat them as just another familiar business firm, but in crucial respects, like charging prices that cover only a fraction of production costs, colleges and universities do real violence to that model and its implications (Winston 1999).[19]

But even though the dual economic nature of colleges and universities has become increasingly clear over the last decade, it has not been possible to say, with any confidence, how important each of those parts is. Are these institutions essentially charities with a minor commercial component, like a museum with a gift shop? Or are they really commercial firms with minor charitable activities like a large corporation with its PR department? The answer, of course, can only be found in the sources of their

[18] It may be obvious, but given the nature of a firm operating under a "non-distribution constraint," the sources and uses of "funds" has to include the imputed costs and income of capital owned by the school. See Winston 1993 "The Capital...".

[19] It was one of the major innovations and strengths of the recent National Commission on the Cost of College that it recognized the uniqueness of the economics of colleges and called for policies that dealt with that reality (Winston 1997).

supporting revenue – how much of it comes from charitable donations and how much from sales proceeds. Those are the data that have been unavailable until we had a complete global accounting that captured all of a school's educational revenues.

With these estimates of saving we can measure a school's income and decompose that income into charitable donations and commercial sales revenues to see which – church or car dealer – is most important. The surprisingly unambiguous result is that higher education is, in these strictly economic terms, much more church than car dealer.[20] Overall, three-quarters of all revenues come from donations, past and present, leaving only a quarter to come from sales proceeds. It's important to emphasize again, we think, that these figures describe the economic nature of higher education as being closer to charity than to commerce.

That is not a trivial fact. There is considerable urgency to understanding its reality and absorbing it into thinking about higher education since there is an increasing tendency to include higher education in our national love affair with privatization and the commercial market. The tendency is to hold that if only colleges and universities can be made to behave more like for-profit business firms, higher education will better serve society; in other words, that car dealers are more efficient than colleges.

So it's a helpful and significant reminder of colleges' natures that economically, their churchly role – in the simplest of dollar terms – is far more important than their

[20] It's worth pointing out that this is quite a different thing from "tuition dependence" because of the way that has come to be measured. Here, we ask what part of a college's total revenue is generated by tuition and what part by donations; in the usual discussion of tuition dependence, tuition revenues are compared to current costs, ignoring saving as the excess of total revenues over costs.

commercial aspect. Colleges and universities have the wealth and appropriations they now have because of their non-commercial missions. A few years ago, Bill Massy made the suggestion – one that should appeal to the hard-headed devotees of privatization – that the aims and obligations of a college should reflect the desires of those who provide the revenues – strictly, "who pays the piper calls the tune." With a three-to-one dominance in funding, the charitable mission of higher education should, on that criterion, clearly dominate its behavior, stiffening resistance to pressures that would cut deals and maximize revenues like competing business firms – or to let themselves be judged by a business bottom line.

In one stark picture, an effort to see where increasingly aggressive tuition discounting for student quality – "merit aid" – is taking higher education suggested that colleges' charitable mission may well be overwhelmed by their commercial behavior. The end-point of price competition appears likely to involve the use of schools' charitable resources to support the commercial price cuts that will make each of them more competitive in the market – or stave off their losses to higher-subsidy schools – even as that price competition drives out need-based aid, limiting low-income access to high quality education (Winston and Zimmerman 2000).

## VI. The Panel from 1986-7 to 1995-6

The results just described rest, with one exception, on data from the larger population of 2,109 schools for which saving estimates are available from 1995-6. In

addition to that single year, we were able to construct a panel of 1,581 schools for which saving could be estimated for 1985-6, 1990-1, and 1995-6. This smaller group is quite representative of the 1996 population, making comparisons meaningful.[21]

We've already cited one use of the panel data averaged over 1986-7, 1990-1, and 1995-6 in looking at schools' saving relative to their wealth and the long run effect on wealth differentials that will be generated by those saving rates – the one exception to using only the 1995-6 data. But Tables 4 and 5 report on the panel data to let us see how well averages over those three years – that include some good years and some bad – tally with the patterns revealed by the larger population for 1995-6 in Table 4 and how patterns in the basic data change over those three years in Table 5.

The brief answer to "How do the 1995-6 patterns hold up when compared with estimates reflecting the full decade?" appears in Table 4. Saving levels are much more modest and differences among sectors are damped when the ups and downs of the decade are recognized. 1996 was an exceptionally good year in which the strong were stronger and the weak did alright. So comparing Table 1 for 1995-6 and Table 4 for the decade, institutional saving drops from an average of $2,500 per student to $1,500 for the three-year average – a decline of 40%. And a higher proportion, by far, of that saving for the three years was in the form of additions to physical capital stock – 54% for the panel against 31% for 1996 alone. In the public sector on average over the three years, in fact, <u>all</u> saving was additions to physical capital, leaving financial saving to appear only in the

[21] There were 31 for-profit schools in the 1995-6 population but none in the panel. Their main effect would be to increase the reported role of commercial revenues for 1996 but since it is only 25% even with that overstatement, they can safely be ignored.

Table 4

# Institutional Saving and Performance

**Panel Average: FY1987, FY1991, and FY1996**

*in 1996 dollars per FTE student*

| | | *Saving* | | | *Distribution* | | *Performance* | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | Total | Financial | Physical | Financial % of Total | Physical % of Total | One Year Negative Saving* | Negative Average Saving | Saving as % Total Resources | Saving as % Wealth |
| **All Institutions** | 1581 | $1,497 | $698 | $799 | 47% | 53% | 40% | 14% | 7% | 5% |
| **All Public** | 888 | $577 | -$8 | $585 | -1% | 101% | 39% | 14% | 4% | 4% |
| **All Private** | 693 | $2,676 | $1,602 | $1,074 | 60% | 40% | 41% | 13% | 11% | 6% |
| ***By Carnegie Type*** | | | | | | | | | | |
| Public Institutions | | | | | | | | | | |
| Research I | 38 | $1,177 | $257 | $920 | 22% | 78% | 21% | 8% | 7% | 5% |
| Research II | 19 | $892 | $237 | $655 | 27% | 73% | 11% | 5% | 7% | 4% |
| Doctoral | 48 | $722 | -$76 | $798 | -11% | 111% | 19% | 8% | 4% | 4% |
| Comprehensive | 208 | $661 | -$46 | $707 | -7% | 107% | 37% | 11% | 5% | 4% |
| Liberal Arts I | 6 | $1,603 | $664 | $938 | 41% | 59% | 50% | 0% | 10% | 5% |
| Liberal Arts II | 50 | $556 | -$94 | $650 | -17% | 117% | 50% | 14% | 5% | 3% |
| Two Year | 511 | $437 | -$44 | $480 | -10% | 110% | 43% | 16% | 4% | 3% |
| Private Institutions | | | | | | | | | | |
| Research I | 15 | $6,493 | $4,304 | $2,189 | 66% | 34% | 20% | 0% | 14% | 7% |
| Research II | 8 | $4,813 | $3,096 | $1,716 | 64% | 36% | 13% | 0% | 16% | 5% |
| Doctoral | 31 | $2,705 | $1,848 | $857 | 68% | 32% | 32% | 16% | 9% | 6% |
| Comprehensive | 167 | $1,661 | $838 | $824 | 50% | 50% | 33% | 13% | 10% | 6% |
| Liberal Arts I | 124 | $6,198 | $4,298 | $1,900 | 69% | 31% | 33% | 6% | 18% | 6% |
| Liberal Arts II | 233 | $1,488 | $703 | $785 | 47% | 53% | 45% | 16% | 8% | 5% |
| Two Year | 48 | $1,430 | $675 | $755 | 47% | 53% | 63% | 19% | 8% | 5% |
| ***By Subsidy Decile*** | | | | | | | | | | |
| Public Institutions | | | | | | | | | | |
| Decile 1 | 89 | $1,196 | $47 | $1,149 | 4% | 96% | 38% | 12% | 4% | 4% |
| Decile 2 | 89 | $698 | -$6 | $704 | -1% | 101% | 44% | 18% | 4% | 4% |
| Decile 3 | 89 | $628 | $34 | $593 | 5% | 95% | 40% | 11% | 5% | 3% |
| Decile 4 | 89 | $711 | $27 | $684 | 4% | 96% | 33% | 11% | 5% | 5% |
| Decile 5 | 88 | $516 | -$40 | $556 | -8% | 108% | 39% | 13% | 5% | 3% |
| Decile 6 | 89 | $517 | $44 | $473 | 8% | 92% | 36% | 6% | 5% | 3% |
| Decile 7 | 89 | $371 | -$106 | $477 | -28% | 128% | 47% | 20% | 3% | 3% |
| Decile 8 | 89 | $338 | -$62 | $400 | -18% | 118% | 36% | 16% | 3% | 3% |
| Decile 9 | 89 | $492 | -$25 | $517 | -5% | 105% | 35% | 9% | 5% | 4% |
| Decile 10 | 88 | $301 | $7 | $294 | 2% | 98% | 44% | 22% | 4% | 3% |
| Private Institutions | | | | | | | | | | |
| Decile 1 | 70 | $9,257 | $6,662 | $2,595 | 72% | 28% | 50% | 1% | 20% | 7% |
| Decile 2 | 69 | $4,428 | $2,815 | $1,614 | 64% | 36% | 39% | 12% | 14% | 7% |
| Decile 3 | 69 | $1,710 | $676 | $1,034 | 40% | 60% | 52% | 19% | 7% | 4% |
| Decile 4 | 70 | $1,863 | $1,041 | $821 | 56% | 44% | 47% | 20% | 8% | 4% |
| Decile 5 | 69 | $2,337 | $1,390 | $948 | 59% | 41% | 26% | 9% | 11% | 6% |
| Decile 6 | 69 | $1,857 | $1,026 | $830 | 55% | 45% | 46% | 20% | 9% | 6% |
| Decile 7 | 70 | $1,591 | $772 | $818 | 49% | 51% | 33% | 11% | 10% | 6% |
| Decile 8 | 69 | $1,473 | $728 | $745 | 49% | 51% | 38% | 17% | 9% | 6% |
| Decile 9 | 69 | $1,165 | $471 | $693 | 40% | 60% | 39% | 14% | 8% | 6% |
| Decile 10 | 69 | $1,015 | $387 | $628 | 38% | 62% | 36% | 9% | 9% | 8% |

Table 5

# Sources and Uses of Educational Revenues in US Higher Education

**Sales, Donations, Expenditures, and Saving**

**Panel Yearly Data: FY1987, FY1991, and FY1996**

*in 1996 dollars per FTE student*

| | Number of schools | Educational Revenues | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | | | Sources | | | | | | Uses | | | | | |
| | | | | | Commercial: Net Tuition $p_n$ | | | Charitable: Donations $\delta$ | | | Production Costs c | | | Savings v | | |
| | N | *1987* | *1991* | *1996* | *1987* | *1991* | *1996* | *1987* | *1991* | *1996* | *1987* | *1991* | *1996* | *1987* | *1991* | *1996* |
| **All Institutions** | 1581 | $13,604 | $12,217 | $15,422 | $3,073 | $3,513 | $4,058 | $10,531 | $8,705 | $11,364 | $12,047 | $11,925 | $12,779 | $1,557 | $293 | $2,643 |
| **All Public** | 888 | $10,187 | $9,441 | $10,202 | $940 | $1,043 | $1,339 | $9,247 | $8,398 | $8,863 | $9,482 | $9,063 | $9,554 | $705 | $378 | $648 |
| **All Private** | 693 | $17,982 | $15,775 | $22,110 | $5,807 | $6,678 | $7,541 | $12,175 | $9,097 | $14,570 | $15,334 | $15,592 | $16,911 | $2,648 | $182 | $5,199 |
| ***By Carnegie Type*** | | | | | | | | | | | | | | | | |
| Public Institutions | | | | | | | | | | | | | | | | |
| Research I | 38 | $13,937 | $14,221 | $15,349 | $2,165 | $2,618 | $3,274 | $11,772 | $11,603 | $12,074 | $12,778 | $13,156 | $14,040 | $1,159 | $1,064 | $1,308 |
| Research II | 19 | $13,142 | $12,132 | $13,473 | $2,119 | $2,396 | $3,264 | $11,023 | $9,737 | $10,209 | $12,179 | $11,652 | $12,240 | $963 | $480 | $1,233 |
| Doctoral | 48 | $12,222 | $11,363 | $12,745 | $1,935 | $2,162 | $2,826 | $10,287 | $9,202 | $9,919 | $11,539 | $10,946 | $11,680 | $683 | $417 | $1,065 |
| Comprehensive | 208 | $11,311 | $10,249 | $11,337 | $1,197 | $1,374 | $1,823 | $10,113 | $8,875 | $9,514 | $10,674 | $9,893 | $10,347 | $637 | $355 | $990 |
| Liberal Arts I | 6 | $14,294 | $13,410 | $14,753 | $1,397 | $1,645 | $2,543 | $12,897 | $11,765 | $12,209 | $11,797 | $12,642 | $13,210 | $2,497 | $768 | $1,542 |
| Liberal Arts II | 50 | $11,156 | $9,854 | $9,902 | $886 | $971 | $1,521 | $10,270 | $8,882 | $8,381 | $10,262 | $9,464 | $9,518 | $894 | $389 | $385 |
| Two Year | 511 | $8,897 | $8,295 | $8,856 | $597 | $628 | $750 | $8,301 | $7,667 | $8,106 | $8,281 | $7,980 | $8,476 | $616 | $315 | $380 |
| Private Institutions | | | | | | | | | | | | | | | | |
| Research I | 15 | $35,346 | $33,382 | $46,319 | $10,528 | $11,815 | $13,363 | $24,818 | $21,566 | $32,956 | $28,107 | $32,127 | $35,335 | $7,240 | $1,255 | $10,984 |
| Research II | 8 | $25,239 | $24,037 | $30,351 | $9,086 | $10,487 | $10,901 | $16,153 | $13,550 | $19,450 | $20,381 | $21,497 | $23,312 | $4,858 | $2,541 | $7,039 |
| Doctoral | 31 | $19,291 | $18,816 | $25,644 | $8,862 | $10,071 | $11,558 | $10,429 | $8,745 | $14,086 | $16,788 | $18,318 | $20,529 | $2,503 | $498 | $5,115 |
| Comprehensive | 167 | $14,977 | $13,179 | $16,885 | $6,134 | $6,934 | $7,867 | $8,843 | $6,245 | $9,018 | $13,239 | $13,002 | $13,816 | $1,737 | $177 | $3,069 |
| Liberal Arts I | 124 | $26,769 | $23,159 | $36,327 | $7,939 | $9,228 | $9,676 | $18,829 | $13,932 | $26,651 | $20,966 | $22,348 | $24,346 | $5,803 | $811 | $11,981 |
| Liberal Arts II | 233 | $15,220 | $12,992 | $17,048 | $4,280 | $4,943 | $5,729 | $10,940 | $8,049 | $11,319 | $13,589 | $13,166 | $14,040 | $1,632 | -$174 | $3,008 |
| Two Year | 48 | $13,428 | $11,470 | $16,269 | $3,692 | $4,285 | $5,197 | $9,737 | $7,185 | $11,072 | $11,756 | $11,591 | $13,530 | $1,672 | -$121 | $2,739 |
| ***By Subsidy Decile*** | | | | | | | | | | | | | | | | |
| Public Institutions | | | | | | | | | | | | | | | | |
| Decile 1 | 89 | $17,213 | $16,303 | $16,470 | $1,153 | $1,400 | $1,853 | $16,060 | $14,902 | $14,617 | $15,584 | $15,434 | $15,380 | $1,628 | $869 | $1,090 |
| Decile 2 | 89 | $12,966 | $11,905 | $12,913 | $907 | $982 | $1,266 | $12,059 | $10,923 | $11,647 | $12,397 | $11,424 | $11,870 | $570 | $481 | $1,044 |
| Decile 3 | 89 | $11,638 | $10,987 | $11,637 | $983 | $1,176 | $1,481 | $10,655 | $9,811 | $10,155 | $10,912 | $10,540 | $10,926 | $726 | $447 | $710 |
| Decile 4 | 89 | $10,548 | $9,826 | $11,156 | $906 | $997 | $1,276 | $9,642 | $8,829 | $9,880 | $9,799 | $9,495 | $10,102 | $748 | $331 | $1,054 |
| Decile 5 | 88 | $9,849 | $9,344 | $10,093 | $946 | $1,014 | $1,364 | $8,903 | $8,330 | $8,729 | $9,328 | $8,948 | $9,461 | $521 | $396 | $632 |
| Decile 6 | 89 | $9,199 | $8,408 | $9,061 | $763 | $861 | $1,157 | $8,435 | $7,547 | $7,904 | $8,535 | $8,075 | $8,508 | $664 | $333 | $553 |
| Decile 7 | 89 | $8,977 | $8,087 | $8,185 | $947 | $1,048 | $1,382 | $8,030 | $7,039 | $6,802 | $8,234 | $7,674 | $8,228 | $743 | $414 | -$43 |
| Decile 8 | 89 | $7,807 | $7,247 | $8,386 | $1,013 | $1,078 | $1,361 | $6,794 | $6,169 | $7,025 | $7,471 | $7,065 | $7,888 | $336 | $182 | $497 |
| Decile 9 | 89 | $7,446 | $6,773 | $7,600 | $913 | $956 | $1,134 | $6,533 | $5,818 | $6,466 | $6,842 | $6,476 | $7,028 | $605 | $298 | $572 |
| Decile 10 | 88 | $6,180 | $5,487 | $6,474 | $862 | $916 | $1,115 | $5,317 | $4,572 | $5,359 | $5,671 | $5,456 | $6,111 | $509 | $31 | $363 |
| Private Institutions | | | | | | | | | | | | | | | | |
| Decile 1 | 70 | $37,139 | $30,745 | $52,096 | $7,495 | $8,408 | $9,422 | $29,644 | $22,337 | $42,674 | $28,469 | $30,517 | $33,221 | $8,669 | $227 | $18,875 |
| Decile 2 | 69 | $23,911 | $20,042 | $29,097 | $5,656 | $6,620 | $7,411 | $18,255 | $13,422 | $21,686 | $19,178 | $19,391 | $21,196 | $4,734 | $651 | $7,901 |
| Decile 3 | 69 | $19,483 | $16,950 | $21,602 | $5,587 | $6,419 | $7,116 | $13,895 | $10,531 | $14,485 | $17,513 | $17,515 | $17,876 | $1,970 | -$566 | $3,726 |
| Decile 4 | 70 | $17,528 | $14,750 | $20,562 | $5,171 | $6,193 | $6,835 | $12,358 | $8,557 | $13,727 | $15,357 | $15,323 | $16,573 | $2,172 | -$573 | $3,989 |
| Decile 5 | 69 | $17,200 | $16,108 | $19,883 | $6,016 | $6,731 | $7,636 | $11,185 | $9,376 | $12,247 | $14,967 | $15,087 | $16,125 | $2,233 | $1,021 | $3,758 |
| Decile 6 | 69 | $15,068 | $13,729 | $18,455 | $5,510 | $6,389 | $7,195 | $9,558 | $7,340 | $11,259 | $13,486 | $13,578 | $14,618 | $1,582 | $151 | $3,837 |
| Decile 7 | 70 | $14,886 | $13,155 | $16,528 | $5,953 | $6,695 | $7,506 | $8,934 | $6,460 | $9,022 | $13,191 | $12,861 | $13,745 | $1,695 | $294 | $2,783 |
| Decile 8 | 69 | $13,245 | $11,798 | $16,437 | $5,786 | $6,676 | $7,623 | $7,459 | $5,122 | $8,814 | $11,874 | $11,766 | $13,420 | $1,371 | $32 | $3,017 |
| Decile 9 | 69 | $11,667 | $10,897 | $13,608 | $5,441 | $6,236 | $7,058 | $6,226 | $4,661 | $6,550 | $10,505 | $10,631 | $11,543 | $1,162 | $266 | $2,066 |
| Decile 10 | 69 | $9,464 | $9,411 | $12,507 | $5,436 | $6,394 | $7,589 | $4,028 | $3,016 | $4,918 | $8,641 | $9,082 | $10,613 | $823 | $328 | $1,894 |

private sector. That's a bit more extreme than might have been expected but these figures do reflect, none the less, what we'd expect from the long run role of physical and financial saving in public and private sectors.

Averaging over the three years of the panel reduces disparities by Carnegie type. From bottom (Public Two-year College, $437) to top (Private Research I University, $6,493) savings differ by a factor of 15 instead of the factor of 32 reported for 1996. Within-sector differences are also slightly reduced in the panel as Public Liberal Arts Colleges save three and a half times what Public Two-year Colleges save and in the private sector, Research I Universities save four and a half times what the Two-year schools save – these contrast with factors of four and five, respectively, for 1996 alone.

But behind all this, it's clear that saving was much more constant over the period in the public than in the private sector – that the private sector was subjected to higher highs (1995-6) and lower lows (1990-1). Table 5 makes this clear as it reports saving for the three years separately in columns (14-16). 1986-7 was an OK year and 1995-6 was very good, but the intervening 1990-1 was grim, especially for schools in the private sector. So the top 10% of private schools in subsidy ranking saved $8,669 per student in 1986-7, then saw that fall to $227 in 1990-1 only to roar back in 1995-6 to $18,875. Schools in the highest subsidy decile in the public sector were spared quite that much inconsistency with $1,628, $869, and $1,090 for the three years. So while total saving went from $1,557 to $293 to $2,643 in 1986-7, 1990-1 and 1995-6, respectively, the public sector considered alone and as a whole went from $705 to $378 to $648 and the private sector from $2,648 to $182 to $5,199. Expressed as percentage changes from 1986-7 to 1990-1

and then from 1990-1 to 1995-6, those figures become: all institutions, -81%, +802%; the public sector, -46% and +71%; the private sector, –93% and +2757%**.**

Aside from the sheer volatility of saving reflected in Tables 4, and 5, the underlying patterns and their significance remain much the same as those reported for 1995-6 alone. Most significantly, the relative importance of commercial and charitable revenues persists through recognition of both good times and bad. Table 6 shows the relative importance of charitable contributions in 1995-6 and from the panel in the aggregate, by sector, and disaggregated by both Carnegie type and subsidy hierarchy[22]. Still, overall, it remains that three quarters of the revenues of higher education come from donations leaving only a quarter from commercial sales revenues; that imbalance is greater for the public than private sector, but even among private schools only a third of their revenue is from commercial sales; the role of charitable contributions is greater in the high-subsidy than low-subsidy schools but those differences are narrower in the public than the private sector. Only in the two bottom subsidy decile averages of the private sector do sales proceeds ever contribute as much as half of total revenue.[23]

[22] Note that the left half of Table 6 is comparable to data in Table 3 - drawing from the entire savings population for 1996 (2109 schools), while the right half, obviously, has only the 1581 schools for which we have all three years' data. The 1996 data for just those 1581 schools is reported in Table 5.
[23] Greater freedom from commercial revenues, of course, makes larger student subsidies possible.

Table 6

# Sources of Revenue in U.S. Higher Education

## Donations and Sales

### 1996 and Panel Average

*in 1996 dollars per FTE student*

| | *1996* | | | *Panel, Three Year Average* | | |
|---|---|---|---|---|---|---|
| | Revenues | Donations | % Donations | Revenues | Donations | % Donations |
| **All Institutions** | $15,487 | $11,489 | 74% | $13,748 | $10,200 | 74% |
| **All Public** | $11,082 | $9,681 | 87% | $9,943 | $8,836 | 89% |
| **All Private** | $20,976 | $13,741 | 66% | $18,622 | $11,947 | 64% |
| ***By Carnegie Type*** | | | | | | |
| Public Institutions | | | | | | |
| Research I | $15,389 | $12,010 | 78% | $14,502 | $11,816 | 81% |
| Research II | $13,425 | $10,123 | 75% | $12,916 | $10,323 | 80% |
| Doctoral | $12,746 | $9,875 | 77% | $12,110 | $9,803 | 81% |
| Comprehensive | $11,742 | $9,809 | 84% | $10,966 | $9,501 | 87% |
| Liberal Arts I | $14,753 | $12,209 | 83% | $14,152 | $12,290 | 87% |
| Liberal Arts II | $10,037 | $8,259 | 82% | $10,304 | $9,178 | 89% |
| Two Year | $8,973 | $8,152 | 91% | $8,683 | $8,024 | 92% |
| Private Institutions | | | | | | |
| Research I | $48,883 | $35,576 | 73% | $38,349 | $26,447 | 69% |
| Research II | $28,158 | $18,177 | 65% | $26,543 | $16,384 | 62% |
| Doctoral | $24,215 | $12,909 | 53% | $21,250 | $11,087 | 52% |
| Comprehensive | $16,542 | $8,723 | 53% | $15,014 | $8,035 | 54% |
| Liberal Arts I | $35,609 | $25,917 | 73% | $28,752 | $19,804 | 69% |
| Liberal Arts II | $17,123 | $11,477 | 67% | $15,087 | $10,103 | 67% |
| Two Year | $14,362 | $9,256 | 64% | $13,722 | $9,331 | 68% |
| ***By Subsidy Decile*** | | | | | | |
| Public Institutions | | | | | | |
| Decile 1 | $25,189 | $23,255 | 92% | $16,662 | $15,193 | 91% |
| Decile 2 | $13,507 | $12,212 | 90% | $12,595 | $11,543 | 92% |
| Decile 3 | $12,278 | $10,688 | 87% | $11,421 | $10,207 | 89% |
| Decile 4 | $10,518 | $9,260 | 88% | $10,510 | $9,450 | 90% |
| Decile 5 | $10,115 | $8,737 | 86% | $9,762 | $8,654 | 89% |
| Decile 6 | $8,970 | $7,974 | 89% | $8,889 | $7,962 | 90% |
| Decile 7 | $8,577 | $7,146 | 83% | $8,416 | $7,291 | 87% |
| Decile 8 | $7,879 | $6,586 | 84% | $7,813 | $6,663 | 85% |
| Decile 9 | $7,332 | $5,982 | 82% | $7,273 | $6,272 | 86% |
| Decile 10 | $6,455 | $4,974 | 77% | $6,047 | $5,083 | 84% |
| Private Institutions | | | | | | |
| Decile 1 | $50,674 | $41,721 | 82% | $39,993 | $31,551 | 79% |
| Decile 2 | $29,353 | $21,542 | 73% | $24,350 | $17,788 | 73% |
| Decile 3 | $23,813 | $16,572 | 70% | $19,345 | $12,970 | 67% |
| Decile 4 | $18,234 | $11,709 | 64% | $17,613 | $11,547 | 66% |
| Decile 5 | $17,894 | $11,138 | 62% | $17,730 | $10,936 | 62% |
| Decile 6 | $15,927 | $9,618 | 60% | $15,751 | $9,386 | 60% |
| Decile 7 | $16,596 | $9,029 | 54% | $14,857 | $8,139 | 55% |
| Decile 8 | $14,148 | $6,947 | 49% | $13,826 | $7,131 | 52% |
| Decile 9 | $12,689 | $5,674 | 45% | $12,058 | $5,812 | 48% |
| Decile 10 | $10,318 | $3,353 | 32% | $10,460 | $3,987 | 38% |

## VII. Conclusions

It's probably fair to say that these saving figures are less interesting in themselves than in what they reveal about more basic economic aspects of colleges and universities. The difference in the role of institutional saving between public and private sectors reflects fundamental differences in their financing as savings differ in level, volatility, and form. Even as a performance measure, saving is more revealing in the private than the public sector where there is less of self-sufficiency so schools can reasonably play it closer to the edge. Saving is quite different among schools within each sector. Disparities are large and since high saving is concentrated in already-wealthy schools, differences in saving, if they persist, will compound disparities in institutional wealth. The volatility of saving over the decade is extreme – the changes among the panel schools between 1986-7, 1990-1, and 1995-6 are remarkable and show more variability among the wealthy schools than the poor. Finally, these figures close the circle to make a complete, global accounting possible that includes most US colleges and universities and yields estimates of the sources and uses of economic resources in service of their educational mission. It should prove of considerable value to have determined that only a meager 25% of those resources come to colleges and universities in their role as commercial firms – the rest is due to their performance as charities in broad service of society.

Appendix A Saving and College Accounts

For a for-profit firm, the sources and uses of funds are, per unit output,

$$(1) \qquad p = c + p$$
$$= c + d + v$$

where $p$ is unit price, $c$ is production cost and $p$ is profit which can be paid out as dividends, $d$, kept as retained earnings, $v$, or divided between them.

A college or university differs in two fundamental ways. As a "donative-commercial enterprise" it is supported by both sales receipts, $p$, and charitable donations, $d$, and it is prevented by law from distributing its profits ($d = 0$), the "non-distribution constraint." So, modifying (1), the sources and uses of funds for a college are, per student fte,

$$(2) \qquad p + d = c + v$$

where retained earnings, $v$, are now defined as saving. $p$ is the price the student pays for a year of educational services, net of institutional discounts (sometimes denoted $p_n$ when it could be confused with a sticker price, $p_s$). College pricing is typically discriminatory so a given student pays either a school's common sticker price, $p_s$, or an individuated price, $p_i$, net of financial aid that is based on her desirability to the school (merit), on financial need, or both. Because of data limitations, all prices, $p$, used in this paper are

average net prices, the price paid by the schools' average student when all institutional discounts are considered. So

$$(3) \qquad p = \left( p_s N_s + \sum_{i=1}^{N_a} p_i \right) / N$$

where $N$ fte students are divided between those $N_s$ who pay the sticker price and the $N_a$ who get individual financial aid discounts, paying $p_i < p_s$ each.

Donative or charitable revenues, $d$, include all non-tuition (non-sales) income so revenues from taxpayers and donors, public and private, present and past – all gifts, $g$, and appropriations, $a$, along with total return, $r$, on the school's net wealth, $w$, again, all expressed per student fte, per year,

$$(4) \qquad d = rw + g + a.$$

Gifts and appropriations don't need comment – either can be unrestricted or restricted to physical or financial saving or programmatic spending. But the return on a college's wealth pushes into unfamiliar territory because of colleges' unusual ownership structure. Returns are total returns, including yield and realized and unrealized gains on net wealth. Returns on net financial wealth are straightforward as total returns on financial assets less the costs of financial liabilities.

But the non-profit nature of a college or university requires a more careful, hence unfamiliar accounting of physical assets.

Because of the non-distribution constraint, a college has no owners. Therefore the value of the physical assets it owns can't simply be subsumed under a market value for the firm itself, as is the convention for firms in the for-profit sector. For a college, the value of its physical capital has to be accounted explicitly as an asset and, like financial assets, valued at its current market, its replacement, value. Any accumulated deferred maintenance is a liability against that asset's replacement value, leaving net physical wealth as – borrowing familiarly from financial wealth conventions – replacement value less accumulated deferred maintenance or, more simply, market value of assets minus liabilities.

The total yearly return on the net physical wealth of a college is simply the year's rental rate – depreciation plus the opportunity cost of funds tied up. In an appropriate college accounting, physical and financial wealth are treated in exactly the same way, in current dollars.

It's clear from (2) and (4) that the cost of the services of the physical capital owned by the college – their rental rate – has to enter the right hand side of (2) as part of c, a cost of production (one that accounts for about 24% of college costs, on average (Winston and Lewis 1997)) at the same time that they are part of the college's donative revenues, $d$, as earnings on assets that the college owns. Reassuringly, the precedent for recognizing the dual nature of the cost of using one's own capital has long been established in the National Income Accounts and taught in Econ 101 where rental costs are imputed

simultaneously as expenditures by and income to the family living in its "owner-occupied house." (Samuelson and Nordhaus 1989, 115)

A year's saving alters net wealth dollar for dollar from beginning to end of year,

(5) $v = w_t - w_{t-1}$.

It was on that basis that we were able to estimate institutional saving from IPEDS data that lacked the information on revenue flows required by (2) but could yield beginning, $w_{t-1}$, and end of year wealth, $w_t$, needed for (5). [See Appendix B for that derivation.]

Since one year's positive (negative) saving will increase (decrease) the next year's net wealth, it will increase (decrease) next year's net asset earning in (4) (*cet. par.*).

Two details remain. To measure real saving, any inflation, $h$, that's taken place within the year has to be recognized to have eroded real wealth so simply differencing nominal wealth in (5) will overstate actual saving. Adjusting for inflation, real saving will be (ignoring timing within the year),

(6) $w_t - (1+h)w_{t-1}$.

Finally, to fit student subsidies into the accounting framework, they need to be defined as,

(7) $s = c - p$

so that from (2),

(8) $d = s + v$.

Donative resources are divided between student subsidy and saving. Before the saving estimates reported here were available it was sometimes assumed that subsidies measured donative resources directly (Winston and Yen 1995, Winston 1999).

Appendix B Estimating Institutional Saving

Like the earlier studies of institutional subsidies (cost less price) and capital stocks and services (Winston and Yen 1995, Lewis and Winston 1997), data reported here were derived from the US Department of Education's Integrated Postsecondary Education Data System (IPEDS). Reports of institutional wealth from the IPEDS Financial data were combined with student FTE measures from IPEDS Enrollment data to identify undergraduate and graduate FTE enrollment for each school so that financial variables could be reported per full time equivalent student.

The population of schools used was limited to accredited colleges and universities – hence those with Carnegie classifications – within the US that had an undergraduate enrollment of at least 100 students in which undergraduates represented 20% or more of the student population. These are the restrictions employed in the initial studies of student subsidies to generate a population of schools appropriate to analyzing US undergraduate education and likely to have moderately reliable data. So we can merge the populations to analyze the saving data according to the student subsidy hierarchy that appears to structure much of higher education (Winston 1999). The 1995-6 population of schools that passed muster for data relevant to these saving estimates was further reduced (by 19 schools) to eliminate those for which subsidy estimates had not been made. The result was 2109 schools that could generate saving data for l995-6. Within that population, 1581 schools yielded saving estimates, too, for 1986-7 and 1990-1 creating a panel of saving data spanning a decade.

Broadly, as described in Appendix A, the necessary data consisted of each school's net wealth – assets less liabilities – at the beginning and end of each year, separated into physical and financial forms. Changes in a school's net wealth, then, define its saving for that year.

Some problems that plagued the earlier studies are eliminated here by use of stock differences, rather than levels. Chief among these is the need, in the earlier cost and capital estimates (Winston and Yen 1995, Lewis and Winston 1997) to generate estimates of capital stock replacement values for those schools where they were not reported. But since our interest here is in changes in the value of a capital stock within the year, replacement and book values should give the same figures – both increase by and only by the increment in physical capital during the year value, in both cases, at current cost (ignoring any inflationary change in replacement values within a year – a change that's quite unlikely to be reflected in any school's reports of replacement values).

If assets and liabilities were reported separately and exhaustively for physical and financial wealth at beginning and end of each year, the task of generating the saving estimates would be straightforward. Unfortunately, that's not the way the data come. Fund accounting was in full reign during the period of these data so at best, wealth is separated by the functional categories of the separate funds. It goes further than that.

One unresolvable difficulty lies in IPEDS' reporting of endowment wealth. An endowment fund, we know, combines "true endowment" with "funds functioning as endowment," each with assets and with potential liabilities. But IPEDS reports one number that sums assets in these two categories and another number that reports assets net of liabilities but only for funds functioning as endowment. There's no way to get at assets net of liabilities for the endowment fund as a whole or for both parts, separately. We could either ignore true endowment assets and use net worth for funds functioning or ignore liabilities in the endowment fund and use combined assets. We chose the latter after examining twenty or so audited annual reports from this period for public and private college and universities to establish that changes in liabilities in endowment funds typically had little effect on net wealth. It's useful, again, that our interest is in changes in wealth and not levels of wealth where neglected liabilities might play a large role.

In some categories, financial assets and liabilities are easy to identify – liabilities show up in the Plant Fund as mortgages, for instance – but in others, only "fund balances" are reported in which liabilities have been netted out against assets. Though that's what we want, we'd be more comfortable to work from separately reported assets and liabilities.

Physical wealth estimates present other problems. They don't, as noted above, require that we distinguish between book and replacement values of physical assets since differencing asset values over a current year takes care of that. They do, though, produce a more fundamental difficulty in the absence of data on deferred maintenance. As

developed at length elsewhere (Winston and Yen 1995, Winston 1993 "New Dangers...", Winston 1992), a proper accounting of physical and financial capital in a non-profit firm treats them symmetrically with the replacement value of physical capital describing an asset (market) value that is offset by the liability of any accumulated deferred maintenance to leave their difference as a net physical wealth, identical conceptually to financial net worth. (Adding financial and physical net worth together, then, gives a useful and consistent measure of total institutional net wealth.)

With clean figures for physical net wealth at beginning and end of year, their difference would describe the year's saving in the form of physical capital. The problem of missing physical liability data appears, though, to be far less serious when estimating saving than it was in estimating the total value of (net) physical wealth (Winston and Lewis 1997) because all that matters is the change in accumulated deferred maintenance within the year. So it's not accumulated deferred maintenance we need here – a virtually impossible number to come by – but the *year's* deferred maintenance which is typically smaller. It must remain, though, that the absence of such physical liability figures causes noise in our numbers. Estimates of physical saving, then, are based on differences in the sum of reported book values of buildings, equipment and land at beginning and end of year.

A final problem with physical assets is that IPEDS asks schools to report all capital <u>used</u> rather than all capital owned. Though that was helpful in generating more accurate production cost estimates for student subsidies, it introduces further noise into the

estimates of capital saving – an increase in the value of the capital stock rented by a school will appear as an increase in wealth, hence saving, but would clearly not represent that at all.

Finally, as noted in the text, in producing these saving estimates – as in earlier estimates of costs and capital stocks (Winston and Yen 1995, Lewis and Winston 1997) – an effort has been made to report only that portion due to each school's educational activities, eliminating any contribution made by other non-educational functions including service and sponsored research in a complex multi-product institution. This is a crude but necessary recognition of sharp differences among schools in the importance of educational activities. So for each school, estimated total saving was reduced in proportion to the importance of non-educational costs in their total costs. The result is reported as educational saving. (Full details are spelled out in Winston and Yen 1995.)

## References


The Chronicle of Higher Education. 2000. Money & Management. 13 October. Lively, Kit, and Scott Street. The Rich Get Richer. A49.

Frank, Robert H., and Philip J. Cook. 1995. *The Winner-Take-All Society*. New York: Penguin Books.

Hansmann, Henry B. 1980. The Role of Nonprofit Enterprise. *Yale Law Journal*. 89,5:835-901.

Hoxby, Caroline M., and Bridget Terry. 1999. Explaining Rising Income and Wage Inequality Among the College Educated. NBER Working Paper W6873.

Inside Carleton: News of the Assuring Excellence Campaign. Summer 1997. [Northfield, MN: Carleton College].

Lewis, Ethan G. and Gordon C. Winston. 1997. Subsidies, Costs, Tuition and Aid in US Higher Education: 1986-87 to 1993-94. Williams Project on the Economics of Higher Education Discussion Paper 41.

McPherson, Michael S., and Morton O. Schapiro. 1994. Merit aid: Students, institutions and society. Williams Project on the Economics of Higher Education Discussion Paper 25.

Samuelson, Paul A. and William D. Nordhaus. 1989. *Economics.* New York: McGraw-Hill Book Company.

United States Department of Education. National Center for Education Statistics. Integrated Postsecondary Education Data System, AY 1996. http://www.nces.ed.gov/ipeds/data.html#data (5/1/01).

United States Department of Education, National Center for Education Statistics. 1994. Integrated Postsecondary Education Data System, AY 1987, 1991 [CD-ROM], *Computer Aided Science Policy Analysis & Research Database System.* Quantum Research Corporation [for the National Science Foundation].

Weber, Valerie, and Gordon C. Winston. 1994. The Economic Performance of Williams, Amherst, Swarthmore, and Wellesley 1988-9 to 1992-3: A Global Comparison. Williams Project on the Economics of Higher Education Discussion Paper 28.

Winston, Gordon C. Forthcoming. Economic Stratification and Hierarchy Among U.S. Colleges and Universities. In McPherson, Michael and Morton O. Schapiro.

*Diversity and Stratification in American Higher Education*. (Currently available as Williams Project on the Economics of Higher Education Discussion Paper 58.)

Winston, Gordon C. 2000. The Positional Arms Race in Higher Education. Williams Project on the Economics of Higher Education Discussion Paper 54.

Winston, Gordon C., and David J. Zimmerman. 2000. Where Is Aggressive Price Competition Taking Higher Education? *Change*. 32,4:10-18.

Winston, Gordon C. 1999. Subsidies, Hierarchy and Peers: The Awkward Economics of Higher Education. *Journal of Economic Perspectives*. 13,1:13-36.

Winston, Gordon C. 1997. College Costs: Subsidies, Intuition, and Policy. In *Straight Talk About College Costs and Prices: The report of the National Commission on the Cost of Higher Education.* Phoenix, AZ: Oryx Press.

Winston, Gordon C., and Ethan G. Lewis. 1997. Physical Capital and Capital Service Costs in U.S. Colleges and Universities: 1993. *Eastern Economic Journal*. 23,2:165-189.

Winston, Gordon C., and Ivan Yen. 1995. Costs, Prices, Subisdies and Aid in U.S. Higher Education. Williams Project on the Economics of Higher Education Discussion Paper 32.

Winston, Gordon C. 1993. New Dangers in Old Traditions: The Reporting of Economic Performance in Colleges and Universities. *Change*. 25,1: 8-23.

Winston, Gordon C. 1993. The Capital Costs Conundrum. *Business Officer*. 26,12:22-27.

Winston, Gordon C. 1992. The Necessary Revolution in Financial Accounting. *Planning For Higher Education*. 20:1-16.