DOCUMENT RESUME

ED 382 261 JC 950 244

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TITLE The State's Return on Investment in the Arizona Community Colleges. Institutional Effectiveness Series: Return on Investment Measure, May 1995.
INSTITUTION Arizona State Board of Directors for Community Colleges, Phoenix.
PUB DATE May 95
NOTE 20p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *College Role; *Community Colleges; *Cost Effectiveness; *Economic Impact; Educational Economics; Financial Support; Human Capital; Investment; Program Effectiveness; *Salaries; *State Aid; Taxes; Two Year Colleges; Wages
IDENTIFIERS *Arizona

ABSTRACT

According to U.S. Census statistics, for every step up in educational attainment, there is an increase in average income. The mean income for those with an associate's degree, $21,116 per year, is five percent more than a person with some college, and 40% more ($6,050), than a person with only a high school diploma or equivalent. The basic cost of obtaining an Arizona community college Associate's degree, $3,267, will increase a persons 40-year worklife income by $242,000 providing a return of 7311% on the original cash investment. In 1992-94, the total state cost for 64 credit hours was $2,356.01 per full-time student equivalent. When the amount of 1994 income taxes paid by high school graduates is compared with those holding associate's degrees, the difference is $238 or 77% more, resulting in a 304% long-term return on the state's original investment. There is also the potential return on investment via sales and sales tax revenues. If the holder of an associate's degree has $6,050 more discretionary income than a person without a degree, that would earn the state another $302.50 per year, which over the course of 40 years could bring the state an additional $12,100. Community colleges serve as a significant gateway for those who wish to pursue bachelor's degrees, and are the central way that the state can improve the standard of living of Arizona residents. (KP)

The State Board of Directors for Community Colleges of Arizona

Institutional Effectiveness Series
Return on Investment Measure
May 1995

The State's Return on Invesment in the Arizona Community Colleges

The State's Return on Investment in the Arizona Community Colleges

by David C. Rubí

May 24, 1995

Introduction

In Fall, 1993, the Executive Director of the State Board of Directors for Community Colleges of Arizona established the Task Force on Institutional Effectiveness Measures. This task force was charged with developing a statewide plan for systematically demonstrating the degree to which the community colleges accomplish the diverse missions entrusted to them by the people of Arizona. The task force was made up of representatives from every community college in Arizona and members of the State Board's staff.

The task force, in its report published in June 1994, recommended that a series of reports periodically be done that deal with the issues of access, transfer, economic impact/work force development, community development, return on investment and other issues of current concern. This current document will report on the "return on investment" portion of the task force recommendations.

One can view the money, time and effort that an individual or government makes in education as an investment in human capital. Whether or not this is an effective investment is a matter of defining what we expect as a "return" on this investment. Some returns may be too subjective to evaluate, such as personal fulfillment and growth. Other forms of return would require literally huge amounts of dollars and time to survey large quantities of community college students to verify whether their educational experience has had an impact on their lives. However, through information provided by the United States Census we can measure whether or not there is any relationship

between income and education and if there is any kind of financial return on this investment for the student and for the state, which is a partner in this investment.

Income & Education: Results from the 1990 U.S. Census for Arizona

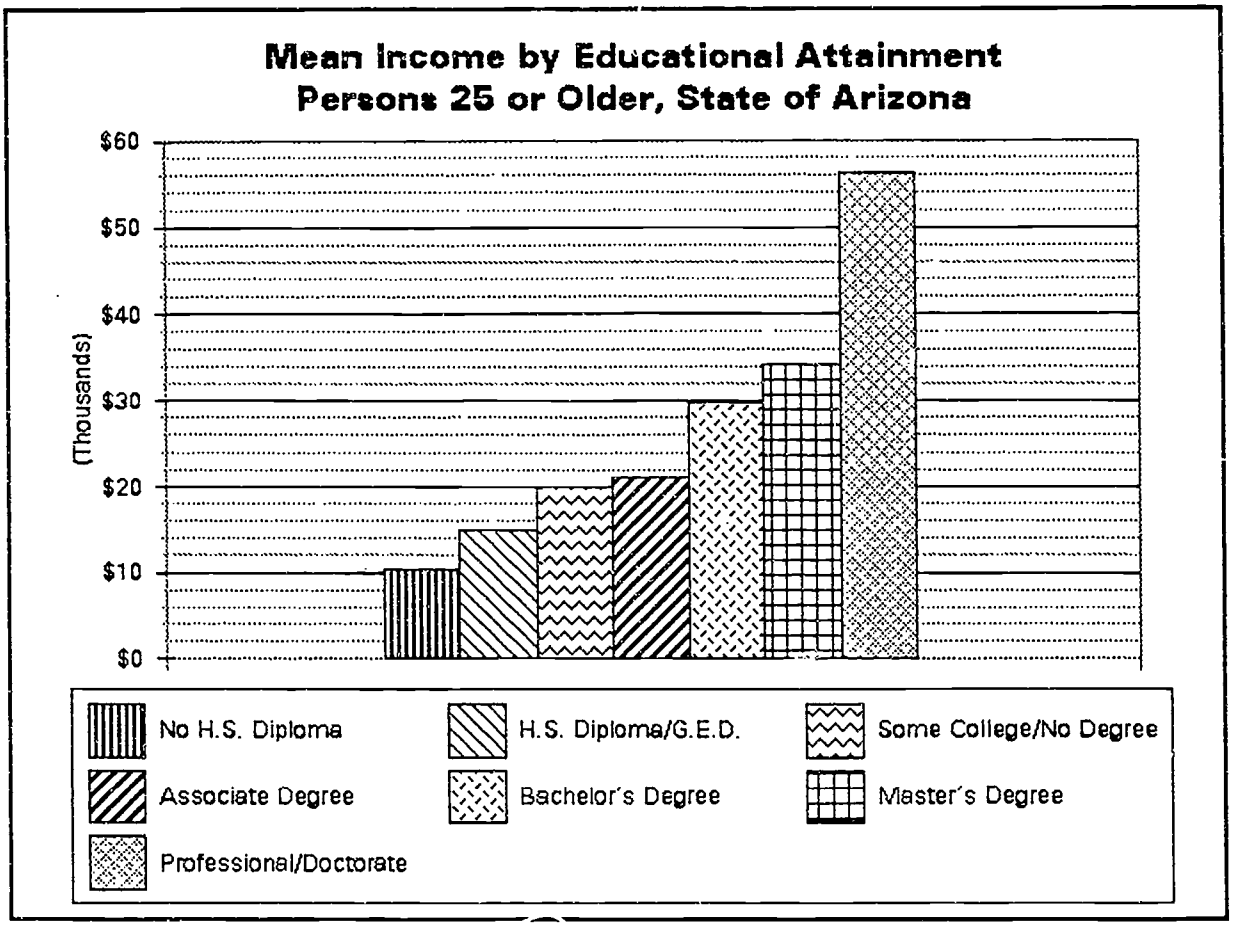
The Arizona Department of Economic Security, Population Statistics Unit, makes information from the U.S. Census available for the public. Data indicating average incomes per educational level for adults 25 years of age or older is shown below:

Table 1: **Mean Income by Educational Attainment**
Persons Age 25 & Over
State of Arizona

Educational Attainment	Total
Not High School Graduate	$10,405
High School Graduate or G.E.D.	$15,066
Some College, No Degree	$20,039
Associate's Degree	$21,116
Bachelor's Degree	$29,756
Master's Degree	$34,210
Professional/Doctorate	$56,190
All Persons 25 and Over	$20,606

Source: 1990 Census Public-Use Microdata Samples File

Without a more detailed analysis of other factors, it is apparent, at least for this measure, that one's income level has much to do with or 's educational level. For every step up in the level of educational attainment, there is an increase in average income, according to the data provided. The only disparities in this are when ethnicity is considered as a factor, but since this is not within the scope of our current discussion, it will not be discussed herein.



Graph A (Refer to Table 1)

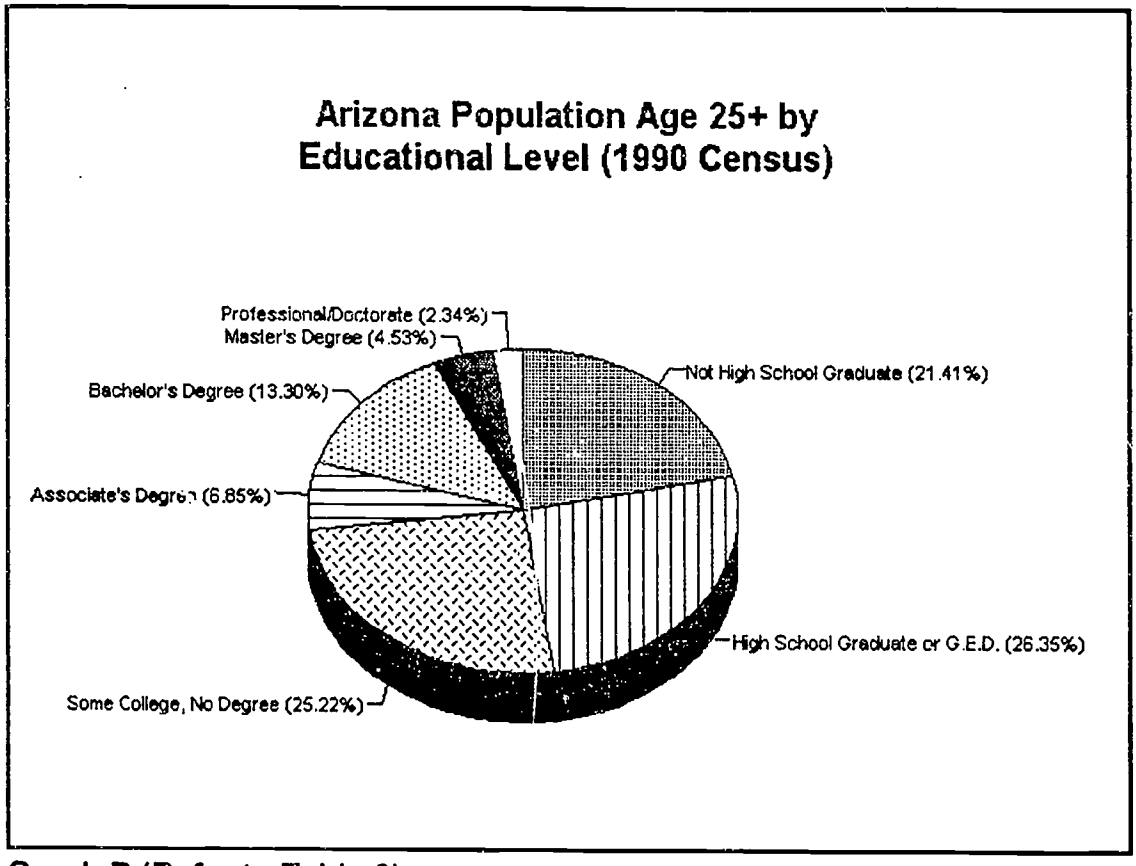
The income of most interest for community college measures is the mean income for those with an associate's degree, which we see is $21,116 per year. This is $1,023 (5%) more income than for a person with some college but no college degree, or $6,050 (40%) more than for a person with only a High School diploma or G.E.D, or $10,711 (103%) more than for a person with no High School diploma or equivalent. On the other end of the spectrum, the associate's mean income is $8,640 (29%) lower than for a person with a bachelor's degree. Overall, the mean income for a person with an associate's degree is slightly above the mean income for all persons age 25 or more ($510, or 2% higher).

What does this mean in terms of impact to the state as a whole? First, one has to look at the state in terms of its population in 1990 when the census was taken. Table 2 indicates the number of persons age 25 or more at each level of educational attainment:

Table 2: **Persons Age 25+ by Educational Attainment Level**
State of Arizona

Educational Attainment	Number	Percent
Not High School Graduate	491,703	21.4%
High School Graduate or G.E.D.	605,109	26.3%
Some College, No Degree	579,229	25.2%
Associate's Degree	157,239	6.8%
Bachelor's Degree	305,526	13.3%
Master's Degree	103,918	4.5%
Professional/Doctorate	53,760	2.3%
Total	2,296,484	100.0%

Source: 1990 Census Public-Use Microdata Samples File (PUMS)



Graph B (Refer to Table 2)

More than one out of every five persons in Arizona (age 25 or more) reported not having completed a high school education or equivalent. More than one quarter had received a high school diploma or equivalent and had not gone further. Together, those with a high school diploma or less education made up almost 50% of our state population over twenty-five. Mean incomes for this group are significantly below the overall mean income (27% lower for high school completers; 50% lower for non-high school graduates). The point is that substantial portions of our state population in 1990 were significantly below the overall mean income for the State of Arizona. Yet the group of people characterized either by just getting some college education or by earning an associate's degree were able to raise their group income, and therefore mean income, at least to the overall state mean.

Community Colleges as Important Providers of Access to Higher Education

The Arizona community colleges are important providers of the benefits of higher education because of their instructional excellence, relatively low cost low cost to students, and easy accessability. By inference from the above data, they are also an important factor for increasing one's standard of living. Of course, all the credit for access to higher education cannot be taken by the community colleges. Undoubtedly, the pool of persons 25 and over includes people who have been educated elsewhere, either out of state or at public universities or in the private sector. But since the Arizona community colleges enrolled over 260,000 persons in 1993-94 and has enrolled from 100,000 to 150,000 people every Fall from 1978 to the present, it is safe to assume that large portion of persons identified as "some college, no degree" went to an Arizona community college.

Also significant, and something we will discuss later, is how the Arizona community colleges are a gateway to a university education and the bachelor's degree. Our colleges have more impact in this area than can be readily appreciated. However, new data, which we will present, gives an indication of this impact. Since bachelor's degree recipients and above tend to make the highest levels of income as a group, it is important to note that community colleges play a role in preparing students for these degrees as well as the higher incomes and professional opportunities that these degrees denote.

The Associate's Degree

Those with associate's degrees are most likely to be community college students. This is the standard degree given by community colleges, though they also award certificates for certain programs of study that require less credit hours than a degree and have narrower course requirements. When analyzing the return on investment for community college students, we will use the population at the associate's degree level of education, because this degree represents the maximum level of community college educational attainment. As noted, the associate's degree recipient had an income slightly higher than the overall mean income. To find out whether or not there is a return on investment for the state's part in paying for a persons community college education, and for the individual's investment, we need to ask the following questions: 1) Does the increase in mean income justify the cost of school for the student who obtains an associate's degree? And 2) Does the increase in mean income signify increased revenues for the state that offset the original cost to the state? The rest of this report will attempt to answer these questions.

Basic Costs to Students versus Increased Income

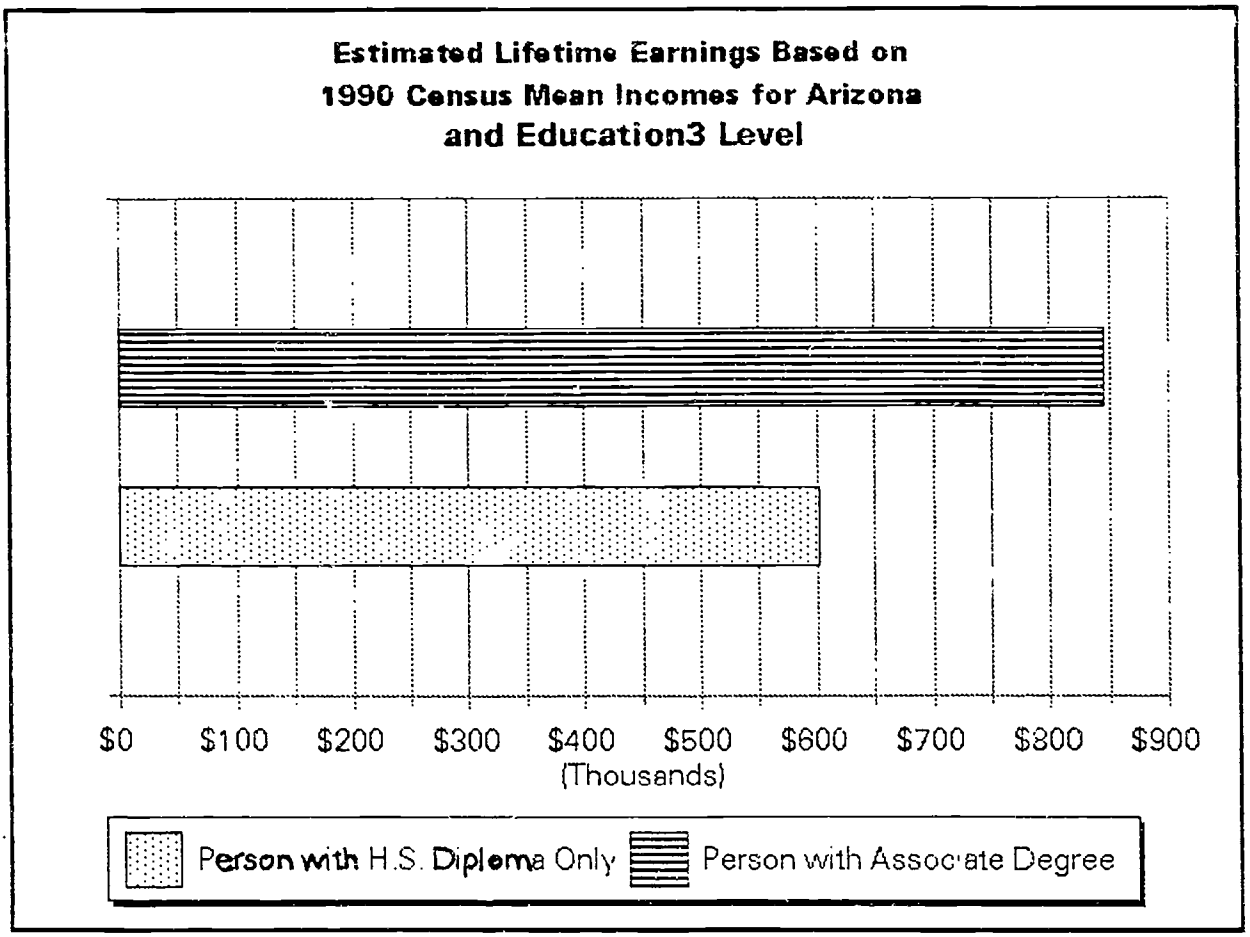
To do this analysis, we must first make some assumptions about a hypothetical community college student and compare her to a hypothetical non-community college student. Let us assume that it is 1994. The first person, Person A has finished her associate's degree and is 25 years of age. She will work until age 65, and have an average income of $21,116 (as per table 1) throughout her worklife. This will give her 40 years of gainful employment. We can make this assumption about income, because the data in table 1 is for all persons 25 years of age or older and is the mean of their incomes. We must assume that this pool includes people at many different levels of pay and many kinds of employment, even unemployment, though we don't know to what degree.

We will compare Person A to Person B. Let us assume that person B is a high school graduate, and is 25 years of age and will work until age 65, with a worklife of 40 years. His income will be $15,066 on an average throughout those 40 years. He will never have any exposure to college, as this would make him represent another category.

Upon comparing these two people, we automatically can see that Person A will make significantly more income than Person B over the period of their worklife:

Table 3: **Comparison of Worklife Income for Community College Degree Recipient versus a High School Graduate**
State of Arizona

Educational Attainment	Income	Years of Work	Worklife Income
Person A, Associate's Degree	$21,116	40	$844,640
Person B, High School Graduate	$15,066	40	$602,640
Differences:	$6,050		$242,000



Graph C (Refer to Table 3)

The difference in income over a 40 year period is almost one-quarter of a million dollars. This is the amount we must use to analyze the return on investment for the community college degree recipient. Costs of going to college vary, but using the most expensive tuition available at an Arizona community in 1993-94 was $32.00 per credit hour, with $5.00 per session registration charge. In 1992-93, this tuition was $29.00 per credit hour, with a $5.00 per session registration fee. We will use these upper-end tuition charges for these periods to determine costs for our hypothetical student, even though there are some colleges that offer significantly lower tuition. We will do this to be

conservative in our estimates and because the district that serves the largest portion of the state charged these amounts.

Other costs, such as: books and materials, room and board, and transportation, are difficult to determine on an individual basis. Besides, the only cost besides those for registration that would be extra for a community college student—a person has to pay for food, housing and transportation whether in school or not—would be the books and materials, which we will estimate at about $60 per three credit hours (typical hours for one class) or $20 per credit hour.

To finish an associate's degree at the target institution, the student will have to have finished a prescribed course of study that includes 64 credit hours over 4 semesters. We assume that the student attends full-time and completes 32 credit hours the first year of study (which will be 1992-93 for the purposes of this study) and 32 credit hours for the second year (which will be 1993-94). We also assume that the student enrolls in and satisfactorily completes all the required classes, we can then analyze the cost of her community college education:

Table 4: **Basic Costs to Obtain an Associate's Degree in an Arizona Community College**
State of Arizona

Item	Unit Cost	Unit	Total Cost
Tuition, 1992-93	$29	32 credit hours	$928
Tuition, 1993-94	$32	32 credit hours	$1,024
Per Session Registration Fee	$5	4 semesters	$20
Books/Materials (per 3 hours)	$20	64 hours	$1,280
Graduation Fee	$5	1 time	$5
Commencement Fee	$10	1 time	$10
Total Basic Cost			$3,267

The basic cost to the student for receiving an associate's degree, albeit under ideal circumstances (full-time attendance and satisfactory academic progress) is significantly lower than the worklife income

of $242,000. So a very small investment in cash for the student, along with a very significant investment of time and effort, will net the completing student a lifetime profit of $238,733 or a return of 731% on the original cash investment. This definitely shows how a community college education positively impacts the lives of its participants, and provides a return that is usually unheard of in any form of investment.

Of course, we must keep this in context of the overall cost to the student: $3,267 may not seem like a lot of money to spend for such a big return on investment, but when one considers that this is an out-of-pocket expense and requires huge personal effort and time commitments, it becomes a cost that can discourage many. Put this way, assuming our community college degree recipient above, her first-year cost would have been $1,578. If her income was that of a high school graduate (no college) when starting her education, then the first-year cost would represent 10% of her total income. This is a large portion of one's income to commit to her education, and does not include the cost of more necessary items such as taxes, housing, transportation, food, and if she has a family, their costs.

Likewise, one must remember that the mean income used is taken from people at all ages and all levels of personal development; we can see it as being a lifetime average income. So, the increase in pay may not come immediately after finishing a degree. There is a certain amount of career development that still must be done before such an average can be reached.

It may be tempting for the government to increase tuition greatly to decrease government's share of the costs, justifying this by the student's return on investment. But this increase would certainly discourage those persons who could benefit most from a college education. It would decrease the accessibility of a higher education for that large segment of the population that has a

high school diploma or less, and would therefore be counterproductive to increasing their standard of living. It is hard for people who do not have much money and who need it now to visualize the benefits of investing what precious few dollars they have for a long-term return.

The next question, of course, is to analyze whether or not the state has a like return on the cost it makes in supporting the state community colleges.

Return on Investment to the State

There are two revenue sources for the state that are most likely to be effected by an increase in residents' income: revenues from income tax and from sales tax. Of the two, income tax revenue is more easily developed into a model to analyze cost to the state for giving a person a community college education versus the state's return via income taxes. In order to do this, we will use our hypothetical student above, attending college full-time from Fall 1992 to Spring 1994. During this period, the State of Arizona invested $85,503,600 in 1992-93 and $85,935,300 in 1993-94 in the Arizona community colleges. This can be analyzed either as cost per student or cost per full-time student equivalent (FTSE). Of these, the latter lends itself best to this analysis, because cost per student does not tell us how much of available resources the student actually used; part-time and full-time students are counted equally. FTSE, however, is based on the number of credit hours and essentially indicates a student completing 30 credit hours (15 per semester) in an academic year.

Table 5: **Cost per FTSE Analysis for State Aid to the Arizona Community Colleges**
State of Arizona

Item	Amount
Total State Aid, 1992-93	$85,503,600
Annual Audited FTSE, 1992-93	÷ 78,174
State Cost per FTSE, 1992-93	$1,093.76
FTSE generated by 32 Credit Hours	1.06667
State Cost for 32 Credit Hours, 1992-93	$1,166.68
Total State Aid, 1993-94	$85,935,300
Annual Audited FTSE, 1993-94	÷ 77,072
State Cost per FTSE, 1993-94	$1,115.00
FTSE generated by 32 Credit Hours	1.06667
State Cost for 32 Credit Hours, 1993-94	$1,189.33
Total State Cost for 64 Hours, 1992-94	$2,356.01

Our hypothetical community college graduate has completed 64 credit hours for her degree. Or, in terms of FTSE, she has generated 1.06667 FTSE per academic year. Therefore, in 1992-93, she cost the state $1,166.68, and in 1993-94, her education cost $1,189.33, for a total cost of $2,356.01. The next question is whether or not there is any return on this investment to the State of Arizona. What follows will be a model that estimates the difference in income tax revenues over the working life of our student (Person A) versus those of a person who has a high school education, but never went to college (Person B).

Return to the State via Income Tax Revenues.

It is reasonable to assume, all other things being equal, that a person earning higher income will pay the state more in income taxes. In terms of the state's educational investment in an individual, is there a return on this investment for the state in the long run? To analyze this, we will assume two hypothetical figures, Person A and Person B, both twenty-five-year-old, independent, single adults with no dependents. The only difference between the two is that Person A holds an

associate's degree and will earn an average of $21,116 over 40 years until age 65. Person B, has high school diploma only and no college, who will also work for 40 years and will have a mean income of $15,066. Since this model assumes these incomes are forty-year averages, it will base its estimates of income taxes paid to the state on the same amounts.

The estimates will be based on income tax owed in 1994. The first step in doing this is to calculate the federal adjusted gross income, which is used to start the calculations for Arizona income tax. We will assume that both persons will file on federal form 1040EZ. They have no other forms of income, and will take the standard deduction. They will also file Arizona form 140A, with the same conditions as above. The filing results will be as follows:

Table 6: **Estimate of Arizona Income Taxes Paid in 1994 on Incomes of $21,116 and $15,066**
State of Arizona

Form	Line Number/Item	Income of Person A	Income of Person B
U.S. 1040EZ	1, Wages, salaries, tips, etc.	$21,116	$15,066
U.S. 1040EZ	3, Adjusted Gross Income	21,116	15,066
AZ 140A	11, Federal Adjusted Gross Income	21,116	15,066
AZ 140A	16, Arizona Adjusted Gross Income	21,116	15,066
AZ 140A	17, Standard Deduction and Personal Exemption	5,600	5,600
AZ 140A	18, Arizona Taxable Income	15,516	9,466
AZ 140A	19, Amount of Tax	546	308
Difference in Arizona Taxes Paid:			$238 or 77% more

If one extrapolates this $238.00 difference in taxes paid over 40 years, we see that Person A will have paid $9,520.00 more in Arizona income taxes during his worklife than Person B. This may seem insignificant, but we must recall that it cost $2,356 for the state to educate Person A in a state community college. So there is a real, long-term return on the state's investment, to the tune of $7,164 in profit or 304% over the state's original investment. Or we can see it in annual terms of

7.6% (non compounded) per year for forty years, which would be a healthy annual return on any long-term investment.

Potential Return on Investment via Sales and Sales Tax Revenues

Another area in which the state would benefit from the higher income of Person A would be in sales taxes. As shown above in table 3, Person A would earn an average of $6,050 dollars more per year than Person B. If Person A's living costs remain about on par with Person B's, then this would give Person A quite $6,050 more discretionary or disposable income than Person B. Of course, we do not know how much of this extra income would be spent in areas that would bring in general sales tax revenue, but if we assume that all of this extra amount were available and used on taxable purchases, then it would mean that the state would earn another $302.50 per year ($6,050 x .05 state sales tax = $302.50). Again, this seems like an insignificant amount, but seen from an investment side, $302.50 per year over the working life of a person (assume 40 years) would be $12,100. Compared to the state's original educational investment in Person A ($2,356), this shows a profit of $9,744 over 40 years or a return of 414% or an 10.3% annual return (non-compounded) on the original investment. This is also an excellent rate of investment, especially when considered in conjunction with the income taxes being paid by the individual.

State Income Tax and State Sales Taxes Considered Together

If one assumes that the mean lifetime income of a person with an associate's degree is going to generate the additional average increases in state income and sales tax over a forty-year period, then the estimated total extra revenue from those taxes will be $21,620 ($9,520 estimated extra income tax revenues over 40 years + $12,100 estimated extra sales tax revenues over 40 years =

$21,620). Compared to the original cost of to the state to educate this person in an Arizona community college ($2,356), this is a return on original investment of $19,264, or 818% (20.4% annual non-compounded return rate over 40 years). Proper investment in human resources gives excellent results, not only to the individual, but also to the state.

What we have not been able to consider here, but should be in future studies, is whether or not, and to what degree, persons with an associate's degree are a cost to the state in terms of welfare payments, health care costs, etc. Since their mean income is so close to the overall state mean income, we can assume, until such studies are done, that this group costs less in the way of state services than do persons at lower income levels.

Impact on the Retail Sector

The impact that the person with an associate's degree can have on the retail sector is significant too. As noted above, in the 1990 census the mean income for a person with an associate's degree was $6,050 more than for a person with only a high school diploma or equivalent. If all of those dollars were available to purchase retail items, then this group of people would have been able to put $951,295,950 (= $6,050 more mean income than those with high school diploma x 157,239 persons with associate's degree) more dollars into the retail economy during the census year than if they had just had a high school diploma or equivalent.

The Community College as the Gateway to the Bachelor's Degree and Higher Income Opportunities:

By looking at the data in table 1 above, we can also see the benefit of continuing higher education. The mean income for bachelor's degree recipients is higher than for associate's degree recipients. Master's degrees earn more than bachelor's. Doctoral and Professional degrees earn more

than master's. But these last two areas require more study, time and effort than most individuals can partake of in their lifetime. Furthermore, one needs to obtain a bachelor's degree before going on to the others. The bachelor's degree recipient earns a comfortable income, even compared to the associate's degree recipient. But what is significant for our purpose of looking at the state's return on the investment in community colleges is that these institutions are gateways for many people who wish to pursue a bachelor's degree.

The community colleges of Arizona are actually doing a significant amount of the lower division undergraduate education that formerly was done at the universities. A case in point is the change in transfer students between the state's largest community college district, the Maricopa County Community College District (MCCCD) and its largest university, Arizona State University (ASU). According to an MCCCD report, in 1982-83, MCCCD transfer students made up 34% of the upper division students at ASU. Yet in 1991-92, this number had increased to 51%.

This data is also corroborated by a recent study done by the Arizona Board of Regents for the State Board of Directors for Community Colleges of Arizona. In this report, based on data from Fall 1994, 43.7% of all upper-division university students had at least one semester of credits (12 hours) from an Arizona community college, while 61.2% of all upper division students had some community college credits. Of course, results varied from university to university: Arizona State having 55.1% of its students with 12 or more community college credits, 66.7% having any community college credits; the University of Arizona having 37.5% and 58.2%, and Northern Arizona University having 22.5% and 51.1%, respectively.

More interesting was the baccalaureate data: 38.7% of all 1993-94 baccalaureate recipients from the Arizona university system had one semester or more of community college credits, while

59.5% had at least one community college credit. Breakdowns for each university are for 12 hours or more and some credit as follows:

Table 7	1993-94 Arizona Baccalaureate Recipients	
Arizona Public University	with ANY Community College Credits	With 12+ Community College Credits
Arizona State University	66.1%	50.1%
Northern Arizona University	38.5%	19.6%
University of Arizona	62.9%	34.8%
Arizona University System	59.5%	38.7%

What this shows is that community colleges support the development of bachelor's degree recipients. As lower division studies are reduced at the universities, entry-level bachelor's degree seekers are coming more and more to the community colleges to take classes they could not find at the universities. The preparation of students for transfer to baccalaureate institutions is only one part of the community college mission. Yet, if certain trends continue, such as limiting of lower-division university classes, capping enrollments, excessively high tuition, etc., then community colleges will play an even more important role in future higher education access to the bachelor's degree. However, as community colleges do more and more of the work of the universities, they are not getting additional funding from the state to compensate for doing university work.

Conclusion

Community colleges provide a healthy return on investment for both the state and the individual who takes advantage of the educational opportunities offered. They seem to have a positive impact on raising group income levels even if it does not result in a degree. This, in turn,

results in a group of people who pay more in taxes, and thusly eventually "repay" the state's investment in them, and have more potential disposable income, which is beneficial to the retail sector. We also assume that they will use less in the way of state services, particularly welfare and the like. However, this should not be considered a free ride for the state, its investment is necessary to keep tuition costs down, and therefore make a real return on investment more viable for individuals. Community colleges also serve as a significant, if not major, gateway for those who wish to pursue a bachelor's degree and the associated economic benefits that come with that, and which can lead to even higher degrees and better income earning potential. In short, the community colleges are a very important, if not central, way that the state can improve the standard of living for the communities and peoples of Arizona.

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May 24, 1995

Acknowledgement and thanks to those members of the Research Advisory Council who reviewed and made comments on earlier drafts of this document.