

Is More Better?

The Impact of Postsecondary Education on the
Economic and Social Well-Being of American Society

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EXECUTIVE SUMMARY

This literature review attempts to discern whether more education is actually better for the individual and society. We investigate the literature and ask: What are the economic and non-economic returns to postsecondary education investments? Who reaps the benefits of those investments? And, most important, are there sufficient returns, both economic and non-economic, to the larger society to justify increasing public investment in higher education?

1. INFORMING THE DISCUSSION: HUMAN CAPITAL THEORY AND TRADEOFFS

Human capital theory is an 18th century concept that has had a lasting impact on how we understand investment in human beings. The basic premise is that the people making up a society are a form of capital in which the society can invest much the same way as it invests in physical capital. Doing so will lead to positive economic outcomes. Although there are several different means of investing in human capital, secondary and postsecondary schools are regularly cited as the public institutions where the primary investment in human capital occurs. Human capital theory is at the foundation of economic growth models concerning education, and our general belief that education is a sound investment.

As is the case with any investment, there are tradeoffs to consider. If a society chooses to adhere to a scarcity model of resources, it must consider how each investment uses resources that might have been used elsewhere. At the end of the 20th century and now, in the early 21st century, we are experiencing significant reductions in state support for higher education. Clearly, a decision has been made, whether actively or passively, that higher education is not the best use of state resources. The work of Okun (1975) provides perspective on another kind of tradeoff that is important to this discussion: equity versus efficiency. When resources are scarce, we think we are better off when we find the most efficient ways to use them. But the most efficient means can also be inequitable.

Where postsecondary education has expanded, the growth of the technology sector has increased opportunities for those in a position to train and re-train, but has significantly disadvantaged those in the manufacturing sector and those in low wage service jobs who are not in a position to train for better paying high skilled work. One might argue that US society is using its human resources more efficiently, by employing high-skilled labor at high salaries and outsourcing lower-paying manufacturing jobs to countries with low-wages. But it is undeniable that US society is becoming more and more inequitable in its distribution of educational opportunities to take advantage of the new economy.

2. PRIVATE ECONOMIC BENEFITS

Successfully pursuing a college degree is potentially the best investment an individual can make. On average,

- Four-year graduates make almost twice as much as non-college graduates;
- Four-year degree holders are more likely to be employed, and when unemployed, likely to find new jobs faster; and
- Even two-year degree holders are more likely to enjoy a higher quality of life than those who have only a high school diploma.

The private economic returns to postsecondary education are real for every group and subgroup, with some caveats:

- College graduates of every race and ethnicity, men and women, members of each socioeconomic group, and families of all configurations are better off than their non-degree holding peers;
- Non-wage economic benefits accrue to degree holders of all types:
 - better employee benefit packages
 - better health care
 - longer vacations
 - better work conditions
- Proportionately fewer low-income people and low-income people of color receive four-year degrees than do middle- and upper-income whites and Asian Americans.

3. PUBLIC ECONOMIC BENEFITS

If it is agreed that the US is in the midst of an economic shift from an industrial economy to a knowledge economy, then having more college-educated citizens may indeed lead to greater economic benefits for the society. An economy that depends more on innovation and management of services requires skills that are presumed to be gained at the postsecondary level.

One body of research considers individual benefits in the aggregate and suggests that society profits from larger numbers of postsecondary degree holders as long as those degree holders enjoy economic rewards. According to research in this area, when individuals benefit, society does as well. Degree holders

- pay more taxes;
- buy more goods and services;

- are more productive; and
- require less government support through social service programs like Medicaid and Temporary Aid for Needy Families (TANF).

NATIONAL ECONOMIC GROWTH

Another way of considering the question of public economic benefit is by asking whether the economy actually grows as a result of public investment in postsecondary education. The relationship between education and economic growth has been investigated regularly since the since the 1960s. Early studies focused on K-12 education and produced rather high rates of return based on growth accounting models. Over the years, different models have suggested lower rates of return on educational investment. Just how much of a return a given country can expect from investing in education is still undetermined.

There have also been attempts to expand the question to postsecondary education. Economists continue to argue about the mechanics of measuring rates of return, but they are in some agreement that basic research and the training of researchers responsible for industrial research and development is a contribution for which research universities are almost solely responsible. The training of researchers is a fruitful type of capital investment, according to economists who have found that both tangible and intangible capital investment are necessary for economic growth.

In addition to supporting human capital investment, economic research in this area also points to the importance of measuring quality. If one assumes that resources are scarce, simply investing in human capital at the postsecondary level may not be sufficient. The quality of that investment must be considered. This particular line of reasoning appreciates the same measurement challenges as others. Determining what constitutes quality requires some in-depth consideration. Researchers currently use four measures: inputs, processes, outcomes, and value-added. Each of these has its pros and cons, but attempting to measure quality is considered a necessity by some.

STATE ECONOMIC GROWTH

Understanding the effect of postsecondary education on economic growth at the state level is also of concern to some economists. States have historically been the primary source of funds for postsecondary institutions. But state support has been decreasing for some time and some economists assert that states need to understand the importance of maintaining a high level of support for postsecondary education. This research is nascent but early findings indicate that state higher education policy directly impacts the creation of new business. A similar finding suggests that highly-skilled labor creates its own demand. These findings are complementary in that they both discuss a positive relationship between state support for higher education and economic growth.

ECONOMIC GROWTH AS MYTH

It is also likely, according to some economists, that researchers have been unable to say with absolute certainty that higher levels of postsecondary completion rates lead to economic growth because no such relationship exists. They assert that investment in postsecondary education is no longer investment toward economic growth but consumption. These scholars consider the entire endeavor to determine rates of return misguided and futile.

4. NON-ECONOMIC RETURNS

Although discussions about investment tend toward economic outcomes, there are also those who attempt to ascertain whether there are non-pecuniary benefits to higher levels of education. Studies show that people with postsecondary degrees enjoy

- increased life expectancy and better general health;
- improved quality of life for self and offspring; and
- increased social status.

At the societal level, the non-economic benefits that accrue include

- lower rates of incarceration;
- higher rates of volunteerism; and
- higher voter participation rates.

Because each non-economic benefit is value laden, it is difficult to say just how important these returns are. Different *investors* may value these non-economic benefits differently, but studies do suggest that the above outcomes are, in fact, benefits.

5. AREAS OF CONFLICT

According to some, as it currently stands, the US is not taking full advantage of its human capital. In order to do so, there needs to be significant change. In addition to the costs of that change there are also concerns about imbalance where some citizens are getting too much education and others are not getting enough.

COST OF MAKING CHANGE

A landmark study by RAND Corporation examined the cost of targeting underrepresented populations in California to bring them up to the education completion rates of well-represented groups. Researchers modeled reducing the gap between blacks,

Mexican Americans, and other Hispanics and whites in the areas of high school completion, college-going rates, college completion, and full equalization across all areas.

If high school graduation rates were equalized, the gap in college going and college completion rates would be reduced significantly for all groups, especially for blacks.

Equalizing high school completion *and* college-going rates reduces the gap between white and black college graduation rates from 15.2 to 10.2 percent. For Hispanic students, the college graduation rate gap is reduced from 26 to approximately 17.5 percent for Mexicans and from 15.6 to 8 percent for other Hispanics.

Under the “full equalization” plan, the share of Mexican 40-year-old college graduates in California would nearly quadruple from 8 to 29 percent, and the share with some college would increase from 37 to 67 percent.

Overall, increasing the educational level of currently underrepresented groups would create significant savings. In California, the estimated public cost-savings ratio of fully-equalizing college completion was \$1 to \$1.9 (1997 dollars). With disposable income included, the ratio increases to \$1 spent to \$4.1 saved.

TOO MUCH EDUCATION?

Two scholars argue that calls for more people with postsecondary degrees are misguided. It is possible, they say, to fill the labor needs of the economy with people who are simply trained to do the necessary work. They posit that high school diplomas have been devalued only by the push for higher education and the need for social stratification. College degrees do not offer proof that certain skills have been attained, and the argument is that if certain skills are desired by the labor market, then training—not greater levels of education—should be required.

6. SUMMARY

The research and scholarship taken into consideration suggests returns to postsecondary education at the individual level, although they are uneven and may be overstated due to reliance on simple descriptive statistics citing income and quality of life measures. And there may be returns at the societal level. Individuals with postsecondary degrees make more money and appreciate all the privileges that go along with that in US society than do those without postsecondary degrees. The society, through tax revenue, decreased spending, and perhaps greater productivity, also benefits from these college graduates. Racial/ethnic and social class access to postsecondary education and to all of the individual benefits that accrue from it is still uneven. Decisions to increase or decrease public investment in postsecondary education must take this into consideration.

Whether other goods in society, such as increased participation in civic life and reduced incarceration rates can be directly attributed to educational attainment levels

is open for debate, but data do show that people with more education vote more and go to prison less.

Much more research is needed about the non-economic benefits of investing in postsecondary education. Certain questions remain unanswered: Is a society better off if all the individuals in that society have an equal opportunity to reap the economic and social benefits of education but do not? Are there generally enjoyed externalities to having a largely highly-educated population? Or does the competition to gain more education diminish the value of lower levels of education and skew the overall benefits?

Overall, the US needs to be circumspect about this issue because the potential impact of increasing, reducing, or maintaining investment levels in postsecondary education is economic and social. The social impact is confounded by the social history of the US. The political process of effecting change is therefore made more volatile than usual, to say the least. It will not be possible to make economic benefit arguments without addressing issues of race/ethnicity and social class in terms of how different groups will be affected.

Given there is much we do not know about the impact of expanding higher education, and the fact that we have limited resources to expand higher education, we are offered only a few choices with regard to prudent public policy. At the top of the list is the acceptance that postsecondary opportunity starts in our nation's 10,000-plus public and private school districts. We need to increase our commitment to public elementary and secondary education such that all students graduate with a set of skills that allow them the most flexibility for their education and career choices. The greatest disservice we do to students is to track them into inflexible career options by limited the type and quality of education they receive. Students from low-income backgrounds, of color, and with disability are severely handicapped, so to speak, in their ability to navigate the school system and receive an equitable education that prepares them fully for a life of work and enjoyment.

Second, if we truly want to expand educational opportunity, the greatest impact, from an economic standpoint, is to focus on those students who have the greatest opportunity to benefit. This suggests targeting first-generation, low-income students, because an education will provide them with the tools to lift themselves up from one social stratum to another. In turn, these individuals will pay more taxes, rely less on public subsidies, become more informed consumers and citizens, and break the cycle of poverty that plagues urban and rural communities alike.

If policymakers do not buy the economic argument of targeted postsecondary expansion to those who do not have such access, perhaps the argument is better staged as being the "right thing to do." Our society is built on the belief that all people have a chance to better themselves and their families, even though that has become even more difficult to do in light of a widening gap between the haves and have-nots. Thus, policymakers can make a prudent choice to provide hope and opportunity to all by

expanding carefully targeted public programs and services to those who can really use them. Society will clearly benefit from this tactic.

All things considered, perhaps we should find guidance in Howard Bowen's (1977) conclusion that the monetary returns from higher education are sufficient to offset all of the costs, and that the non-monetary returns, measured in social stability and efforts toward equality, are much greater in value: "In short, the cumulative evidence leaves no doubt that American higher education is well worth what it costs" (p. 448).

INTRODUCTION

There is an ideal at the heart of everything American, and the ideal at heart of the American university is intellectual training, the awakening of the whole [person], the thorough introduction of the student to the life of America and of the modern world, the completion of the task undertaken by the grammar and high schools of equipping [that student] for the full duties of citizenship. . . . We have misconceived and misused the college as an instrument of American life when we have organized it and used it as a place of special preparation for particular tasks and callings. It is for liberal training, for general discipline, for that preliminary general enlightenment which every[one] should have who enters modern life with any intelligent hope or purpose of leadership and achievement.

—Woodrow Wilson, 1909¹

There is much discussion about the role of education in the economic and social development of a nation. Politicians consistently use education as a platform for global competitiveness, suggesting that a highly-educated workforce will result in a competitive workforce. For most Americans it makes sense that the more education one has the better off the individual. With more individuals better off, society therefore undoubtedly benefits.

A plethora of statistics illustrates the private and societal returns to education. A number of reports point out the positive returns to education, showcasing the correlation of education with financial and social returns to the individual and other returns to society at large (IHEP, 1998; Baum and Payea, 2004; Weiss, 2004). Benefits from postsecondary education are said to include—but are not limited to—increased tax revenues, higher salaries and benefits, reduced crime rates, and improved quality of life. Other researchers have noted the importance of high quality education to economic growth (Carnevale and Desrochers, 2001; Hanushek and Kimko, 2000).

The discussion of returns to education, however, seems mostly one-sided. Not that the real-life findings would not support the claim of education as the all-important factor in the success of a nation and the individual, but rather, there is very little empirical discussion of the true effect of education on workforce progress, wealth of nations, and democratic development. In the constant push to educate more of our citizens, we do so because we believe it to be the right thing to do. But rarely is this argument guided by reliable data. In an era when government budgets are tight and tightening, the portion of the federal, state, and local budgets that fund education are continually pressured. Education is an easy target for both support and criticism among policymakers and appropriators. When push comes to shove, education quite often is on the losing end of the budget debate.

¹ In an article for *The Delineator*, November 1909, as excerpted in *Woodrow Wilson on Education*, ed. August Heckscher (New York: Woodrow Wilson Foundation, 1958).

For most Americans, it makes sense that the more education one has the better off the individual. With more individuals better off, society therefore undoubtedly benefits.

In order to provide information to support this dialogue, the discussion that follows attempts to discern whether more education is actually better for the individual and society. We investigate the literature and ask three questions:

- What are the economic and non-economic returns to postsecondary education investments?
- Who reaps the benefits of those investments?
- Are there sufficient returns, both economic and non-economic, to the larger society to justify increasing public investment in higher education?

We do not offer any conclusions as to whether one set of arguments is correct, but we do provide a list of suggestions as to how researchers and policymakers might proceed with the knowledge gained from this conversation with the literature.

Our discussion begins in Part I with a brief discussion of human capital theory, which is at the heart of much of the work done in this area. This part also includes some discussion of the kinds of tradeoffs one has to consider when debating how to rank public investment priorities.

In Part II we address the economic returns of education. Our first discussion concerns private returns on education: the economic benefits to the individual. We then take a close look at the economic benefits to the public, guided by a discussion of the current and future workforce and our emerging knowledge economy. The section ends with a summary of the economic literature on public benefits where we present both research that details benefits and research and scholarship that assert no such benefits exist.

In Part III we discuss non-economic public and private returns, such as improvements to society and quality of life. Readers will note that the findings are more subjective than those in the economic benefits section.

Conflict is the subject of Part IV, where we discuss two areas in the literature that take the findings discussed in Parts II and III in very different directions. In the first section, researchers adhering to the findings that show a benefit to society of increased public investment simulate equitable expansion and cost it out. In the second section, we present research on overeducation. This research suggests that if any growth in public investment should occur it need not be universal. Instead, it should be focused on specific societal needs.

In Part V, we reflect on this discussion with an attempt to ascertain what all of this research and discussion means to US society. Is more postsecondary education better? Or should we begin to think differently about expansion of postsecondary education?

PART I. INFORMING THE DISCUSSION

The literature contained in this review comes from several different bodies of knowledge, including economic and sociological research. It also encompasses interdisciplinary research conducted by policy research centers for specific policy audiences. The majority of studies discussed in this report explicitly or implicitly addresses human capital theory. It is also the case that a number of the studies highlight the kinds of tradeoffs at stake in attempting to understand the benefits to certain investments and the decisions that have to be made about whether to continue, decrease, or increase the level of those investments. For these reasons, we think it pertinent to describe in brief what human capital theory is and how we have chosen to look at the tradeoff question.

HUMAN CAPITAL THEORY

Investment in the individual is a long-term prospect with short-term political implications. It is good and necessary to invest in human capital, but it is extremely difficult to measure the outcomes of that investment in the near future. This is the set of assumptions with which human capital theory presented us beginning in the late 18th century. According to human capital theory, both the individual and society benefit from investing in that individual. The theory did not come under serious investigation until the late 20th century with the development of methodologies that allowed researchers to measure costs and benefits on a very large scale, but it has been at the core of discussions about public investments in people from its inception.

Sweetland (1996), in his thorough review of the literature on human capital theory, stated that education is not the sole investment that the public can make in humans, but rather, the source of many benefits. Education has been linked to better health and nutrition, manageable population growth, and democracy. Investments in education, therefore, are investments in a number of positives, or externalities, for the larger society. Education is also credited with developing skills in the workforce for productivity in the labor market. According to human capital theory, this can be measured by earned income. While all of this finds a home in conventional wisdom, researchers are not convinced that it is altogether true.

In addition to laying out the tenets and assumptions of human capital theory and its illustrious history, Sweetland (1996) suggests that there is nothing inherent in formal schooling that leads to the development of workforce skills; on the job training and apprenticeships could do the same thing and would not require public investment. Wages alone do not necessarily reflect skill sets or reward productivity, but they do reflect employer attitudes toward certain types and levels of education. Sweetland concludes:

Investments in education, therefore, are investments in a number of positives, or externalities, for the larger society.

While educators know that the primary and most important purposes of education are not economic, they also recognize the effects that public opinion can have on funding for the provision of education as well as the means and methods by which education is provided...When the economy takes a turn for the worse, however, the public conception of education as an economic investment can become devastating. (Sweetland, 1996, p. 356)

Public postsecondary educational institutions are now facing this dilemma. Perhaps the literature in this review and our suggestions as to its relevance can shed some light on the current situation.

PUBLIC GOOD: EQUITY VERSUS EFFICIENCY

At the heart of this paper is the question of whether the public should invest in postsecondary education at greater or lesser levels than it does now. As will be discussed in subsequent sections, deliberations over this question tend to be dominated by concern over the economic costs and benefits, both perceived and realized. If it is true that the United States has made the transition from an industrial to a knowledge economy—and will not likely return—then the pressures of efficiency in this system will continue to produce increasingly large inequities. This is an age-old conflict in policy development, evaluation, and analysis. It is also a conflict that must be kept in mind in any discussion of public investment.

The Godkin Lectures of Arthur M. Okun (1975) explicate this conflict by clearly describing the “the big tradeoff.” Inherent in a free market economy is a drive toward efficiency, which produces, without fail, glaring human indignities. A society must then choose how many people and which people should be sacrificed in the tradeoff between equity and efficiency. This is the challenge that Carnevale and Rose (1998) highlight when they discuss both the growing income gap and the chafing nature of efficiency in areas such as education and health care, where professionals in the field are replaced or managed by process professionals.

The next two sections provide a review of literature related to economic and non-economic returns to investment in postsecondary education. It is useful to note how economic returns receive more attention in the literature and are thus given more importance over social returns, although there is little evidence that these economic returns are more important or critical.

Inherent in a free market economy is a drive toward efficiency, which produces, without fail, glaring human indignities.

PART II. ECONOMIC RETURNS

Of primary concern for investors is the rate of return to their investment. Investment in postsecondary education is no exception. The government invests in postsecondary education through government subsidies and financial aid, and the private sector invests in postsecondary education through tuition and other payments because each expects returns. It is, however, difficult to ascertain what economic outcomes are the direct results of investments in education. In truth, it is easier for individuals to understand the economic impact of their own investment in education than it is for the society at large. This is quite possibly the reason that policy discussions have focused primarily on private returns to education and could possibly be responsible for the shifting of postsecondary education costs from the taxpayer to the individual (IHEP 1998). In this section we present theories and findings about economic returns to education in general with a focus on postsecondary education. We have included findings about returns to K-12 investment in developing countries because where systems are not publicly financed some similarities have been drawn to the US postsecondary system. We discuss whether this is appropriate, in what instances, and to what ends.

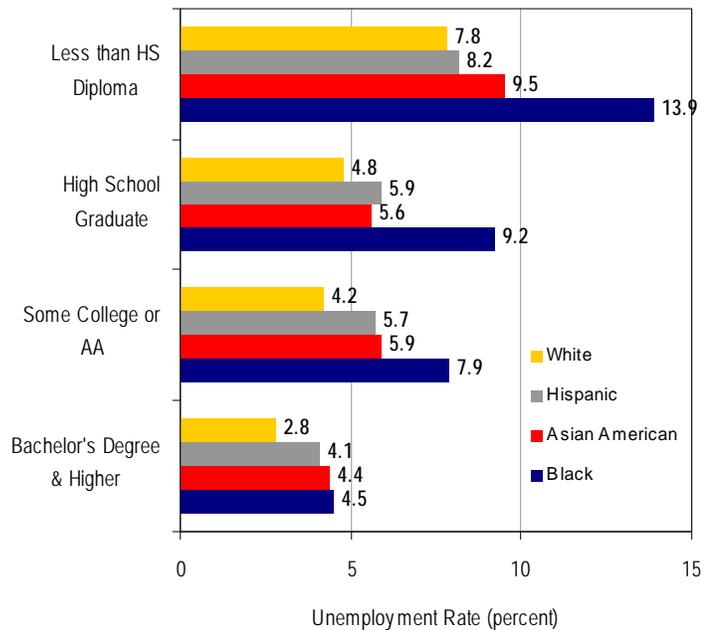
PRIVATE ECONOMIC RETURNS

Evidence clearly illustrates that individuals who invest in postsecondary education will reap economic returns upon successful completion if they so desire. The size and scope of the benefits vary by gender, race, and ethnicity, but individuals who earn a postsecondary credential do reap greater financial rewards than non-credentialed individuals.

UNEMPLOYMENT

In the following table (Exhibit 1) taken from the College Board report, *Education Pays 2004* (Baum and Payea 2004), it is clear that having a postsecondary degree makes one more likely to be employed. This is especially important for blacks, considering the very high unemployment rates for high school graduates in that group (9.3 percent). When blacks attain at least a bachelor's degree, their unemployment rate drops by half to 4.5 percent. This rate is still higher than any other group, but what is gained is more substantial. Exhibit 1 is also telling in that black high school dropouts have the most negative response from the labor market, with a rate almost double that of white students.

It is, however, difficult to ascertain what economic outcomes are the direct result of investments in education. In truth, it is easier for individuals to understand the economic impact of their own investment in education than it is for the society at large.

Exhibit 1. Unemployment Rates by Race/Ethnicity and Educational Level, 2003

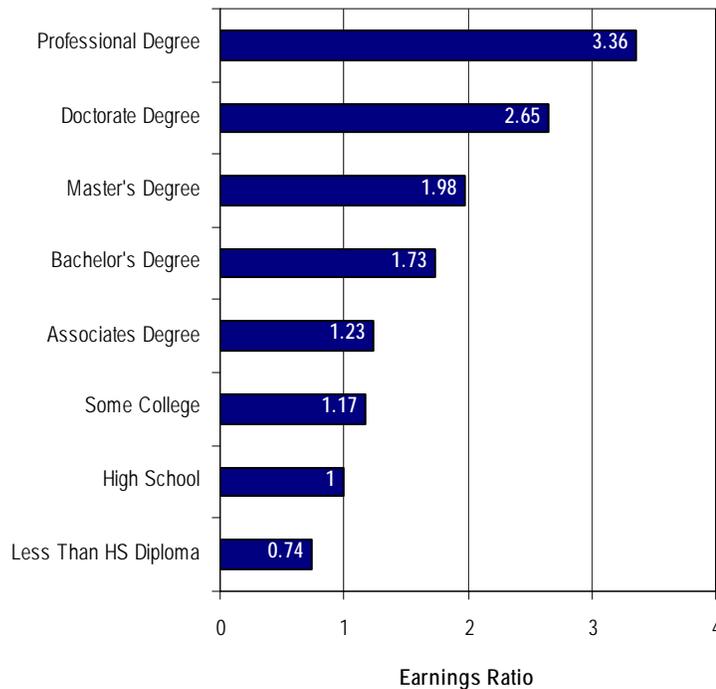
SOURCE: Baum and Payea (2004).

EARNINGS

It is also clear that having a bachelor's degree makes one 1.7 times better off, economically speaking, than does having a high school diploma. The lifetime earnings return only improves as additional degrees are attained. In 2003, the after-tax median earnings for a high school graduate were \$17,332, compared to \$37,949 for a college graduate. Master's degree holders enjoyed a median after-tax salary of \$44,615.

These data support and are supported by existing research which has consistently found that there are significant and positive returns to having some college (Paulsen 1998) and that each level of education provides more returns than the level below (Averett and Dalessandro 2001). Research also suggests that everyone—regardless of race or socio-economic status—reaps benefits from continued education (Jaeger and Page 1996), as indicated in Exhibit 1.

In 2003, the after-tax median earnings for a high school graduate were \$17,332, compared to \$37,949 for a college graduate.

Exhibit 2. Expected Lifetime Earnings Relative to High School Graduates, by Education Level

SOURCE: Baum and Payea (2004).

Although there is agreement that education beyond high school produces benefits, there is some disagreement about whether some college and two-year degrees provide the same value added as BA and further degree programs. Exhibit 2 seems to support the findings of Paulsen (1998), but Grubb (1993) finds that some college does not offer many benefits². The average differential in lifetime returns for a bachelor's degree is 1.73, or 73 percent more than a high school graduate. An associate's degree earner earns approximately 23 percent more than a high school graduate. *Education Pays* also notes that while approximately 29 percent of families (married and single parent headed) with some college or below are in poverty, only 2 percent of those with bachelor's degrees are in poverty. Having a four-year degree would appear to be a poverty deterrent for families of all configurations.

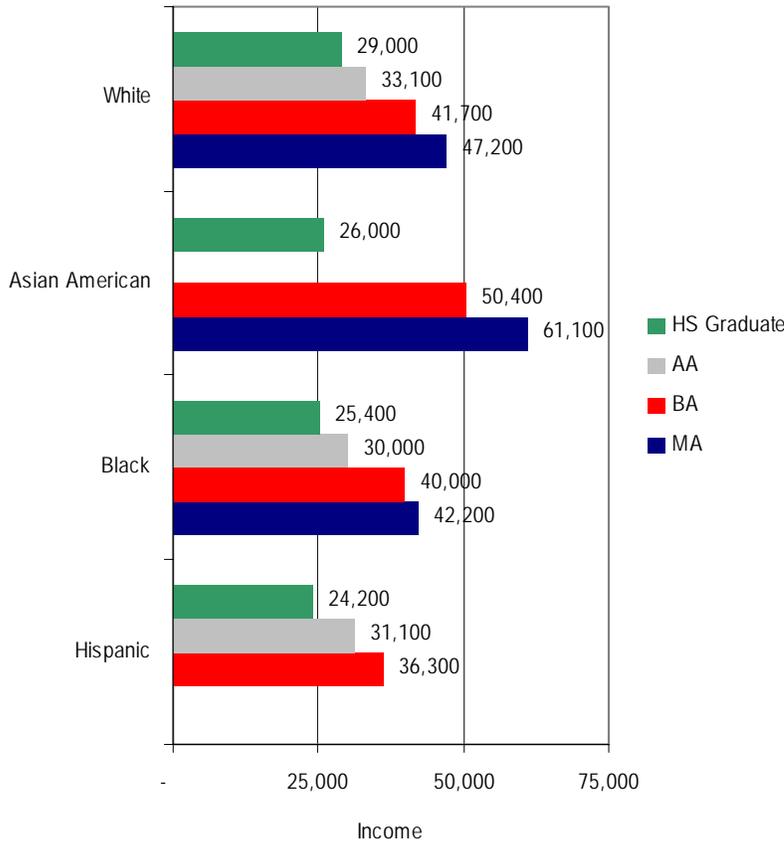
The labor market does not reward all comers alike. The College Board report shows a salary difference by race/ethnicity and gender. Exhibit 3 illustrates the median earnings for individuals by race/ethnicity and highest education attained. As illustrated, each additional level of education results in a higher pay level. It is also clearly evident that blacks and Hispanics do not get paid as well for similar levels of education. To be sure, these raw data do not account for other factors associated with educational attainment, such as the discipline and institutional selectivity (selective institutions have higher returns to education than moderately/non-selective institutions). Regardless, the Census data reported in Exhibit 3 show that, among BA recipients,

² This finding is challenged by Kane and Rouse (1995) on methodological grounds which seem to stand on very firm arguments. Only Grubb's findings concerning the lack of benefit to some

Each additional level of education results in a higher pay level. It is also clearly evident that blacks and Hispanics do not get paid as well for similar levels of education.

Asians make over \$8,000 more than whites, who in turn make \$1,700 more than blacks, who make \$3,700 more than Hispanics. Women earn considerably less than men. In 2003, a male BA recipient earned, on median, \$56,500. Comparatively, a woman with the same level of education earned \$41,300. This finding is exacerbated at the professional level, where men earned \$100,000 and women earned \$66,500, a differential of 50 percent. Not all is equitable in America.

Exhibit 3. Median Earnings by Race/Ethnicity and Educational Level, 2003: Ages 25-34



SOURCE: Baum and Payea (2004).

Who reaps these benefits is an area of conflict in the research community. While Jaeger and Page (1996) assert that “sheepskin effects” are the same for all degree-holders regardless of race, Grubb (1993) and Averett and Dalessandro (2001) produce findings that show gender and race differentiation in benefits. Grubb finds that women earn less than men, and black men earn less than everyone. He also asserts that labor market discrimination does not exist for black women and that Hispanic women earn more than their peers. Furthermore, according to Grubb, socioeconomic status privilege persists from generation to generation and is more likely to be passed on to sons than daughters. Averett and Dalessandro (2001) approach the topic from a slightly different perspective, but come to similar conclusions. Although black men reap fewer benefits than everyone else, they are the greatest winners in

college (attending a two-year school without receiving a degree) and the indirect benefit of two-year degrees are challenged. Grubb’s other findings are not affected.

terms of returns to a bachelor's degree in comparison to what they might earn without one (Averett and Dalessandro 2001).

Not all researchers agree with the idea that investment in a postsecondary degree will result in significant benefits. Twenty-five years ago, Freeman (1980) found that the income of white male degree holders was falling regardless of the fact that it was still higher than every other group. And Ashworth (1997), in response to Jaeger and Page (1996), points out that increases in costs to pursue postsecondary education diminish the overall benefits.

OTHER BENEFITS

There are other private economic returns which are related to the labor market rewards for postsecondary degree attainment in terms of the individual freedoms the rewards allow. Degree holders enjoy better fringe benefits, longer vacation time, and better health care than non-degree holders (Smeeding 1983). They are in a better position to save and contribute to savings plans at higher rates (Eller and Fraser 1995), have better work conditions (Duncan 1976), and when they are displeased with their work conditions, are better able to find other employment (DaVanzo 1983).

Clearly, individuals with postsecondary degrees reap many benefits from higher education relative to those without those degrees. Graduates reap the benefits whether they have made the original investment or not. This is the crux of debates about whether the public should invest in higher education in significant amounts because while it is easy to see the individual economic benefits, seeing the economic benefits to the larger society is a far greater challenge.

Degree holders enjoy better fringe benefits, longer vacation time, and better health care than non-degree holders.

PUBLIC ECONOMIC RETURNS

There are a number of arguments in the research about whether there are specific public returns to the public investment in education in general and postsecondary education specifically. The primary reason for this disagreement is that there is no clear and undisputable way to define and measure benefit (Pritchett 2004; Pritchett 2004; Psacharopolous and Patrinos 2004). This is true within a single country and, subsequently, cross-nationally as well. At the individual level, one can count the number of years of attendance (with a number of variations on what that means) and measure wages. This is a vast over-simplification of studies of individual benefits, but no such statement can be made, even in the hypothetical, about public benefit.

It is possible, however, to have conversations about what individuals think about economic needs for better educated people. Contemporary discussions in this vein center on the relationship between education and the workforce and on the development of a knowledge economy in the United States.

THE KNOWLEDGE ECONOMY

No one can say for certain which phenomenon is the driving force, but the expansion in postsecondary access has been accompanied by an economic transformation. Industrial production has given way to the knowledge industry and is now a thing of the past. Using data from the Bureau of Labor Statistics (BLS), we can look at occupational distribution in 2000 and project to 2010 (Hecker, 2001). In 2000, of the approximately 145 million workers in the US, 18 percent were professionals, 18 percent service occupations, 16 percent office support, and 11 percent management (Exhibit 4). That leaves less than 40 percent of our workforce devoted to farming, construction, maintenance, production, and transportation. Projections from 2000 to 2010 show a 15.2 percent growth in overall employment, with the two greatest areas of growth in professional and related occupations and service occupations. Most other areas show slight declines over the decade.

In 2000, of the approximately 145 million workers in the US, 18 percent were professionals, 18 percent service occupations, 16 percent office support, and 11 percent management.

Exhibit 4. Employment by Major Occupational Group, 2000 and Projected 2010

<i>(in thousands of jobs)</i>	Employment				Change	
	Number		Percent Distribution		Number	Percent
	2000	2010	2000	2010		
Total, all occupations	145,594	167,754	100.0	100.0	22,160	15.2
Management, business, and financial occupations	15,519	17,635	10.7	10.5	2,115	13.6
Professional and related occupations	26,758	33,709	18.4	20.1	6,952	26.0
Service occupations	26,075	31,163	17.9	18.6	5,088	19.5
Sales and related occupations	15,513	17,365	10.7	10.4	1,852	11.9
office and administrative support occupations	23,882	26,053	16.4	15.5	2,171	9.1
Farming, fishing, and forestry occupations	1,429	1,480	1.0	0.9	51	3.6
Construction and extraction occupations	7,451	8,439	5.1	5.0	989	13.3
Installation, Maintenance, and repair occupations	5,820	6,482	4.0	3.9	662	11.4
Production occupations	13,080	13,811	9.0	8.2	750	5.7
Transportation and material moving occupations	10,088	11,618	6.9	6.9	1,530	15.2

NOTE: Detail may not equal total or 100 percent due to rounding
 SOURCE: Hecker (2001)

Exhibit 5. Fastest-Growing Occupations, 2000–2010

<i>(in thousands of jobs)</i>	Employment		Change		Quartile rank by 2000 median annual earnings	Most significant source of education or training
	2000	2010	Number	Percent		
Computer software engineers, applications	380	760	380	100	1	Bachelor's degree
Computer support specialists	506	996	490	97	2	Associate's degree
Computer software engineers, systems software	317	601	284	90	1	Bachelor's degree
Network and computer systems administrators	229	416	187	82	1	Bachelor's degree
Network systems and data communications analysts	119	211	92	77	1	Bachelor's degree
Desktop publishers	38	63	25	66	2	Postsecondary vocational award
Database administrators	106	176	70	66	1	Bachelor's degree
Personal and home care aides	414	672	258	62	4	Short-term on-the-job training
Computer systems analysts	431	689	258	60	1	Bachelor's degree
Medical assistants	329	516	187	57	3	Moderate-term on-the-job training
Social and human service assistants	271	418	147	54	3	Moderate-term on-the-job training
Physician assistants	58	89	31	53	1	Bachelor's degree
Medical records and health information technicians	136	202	66	49	3	Associate's degree
Computer and information systems managers	313	463	150	48	1	Bachelor's or higher degree, plus work experience
Home health aides	615	907	291	47	4	Short-term on-the-job training
Physical therapist aides	36	53	17	47	3	Short-term on-the-job training
Occupational therapist aides	9	12	4	33	3	Short-term on-the-job training
Physical therapist assistants	44	64	20	45	2	Associate's degree
Audiologists	13	19	6	46	1	Master's degree
Fitness trainers and aerobics instructors	158	222	64	41	3	Postsecondary vocational award

SOURCE: Hecker (2001)

The fastest-growing occupations between 2000 and 2010 are expected to be in areas where a postsecondary education credential is required. As illustrated in Exhibit 5, 8 of the top 10 percentage growth areas require a postsecondary degree—6 at the BA level. Among the top 20, 14 require a postsecondary degree and 9 require a BA or higher. Note from the exhibit that 8 of the top 10 are also computer related.

While Exhibit 5 pointed out the growth occupations by largest percentage growth, Exhibit 6 focuses on the actual growth of jobs. The greatest job growth between 2000 and 2010 is expected to be in food preparation and service, including fast food, with an increase of 673,000 jobs, or 30 percent higher than at the start of the decade. Other gainers include customer service representatives (631,000), registered nurses (561,000), and retail salespersons (510,000). Among the top 10 with respect to actual job growth, 3 will require a postsecondary degree and only 1 will require a BA. Of the top 20, 6 will require a postsecondary credential and 4 will require a BA.

Exhibit 6. Occupations with the Largest Job Growth, 2000–2010

(in thousands of jobs)	Employment		Change		Quartile rank by 2000 median annual earnings	Most significant source of education or training
	2000	2010	Number	Percent		
Combined food preparation and serving workers, including fast food	2206	2879	673	31	4	Short-term on-the-job training
Customer service representatives	1946	2577	631	32	3	Moderate-term on-the-job training
Registered nurses	2194	2755	561	26	1	Associate's degree
Retail salespersons	4109	4619	510	12	4	Short-term on-the-job training
Computer support specialists	506	996	490	97	2	Associate's degree
Cashiers, except gaming	3325	3799	474	14	4	Short-term on-the-job training
Office clerks, general	2705	3135	430	16	3	Short-term on-the-job training
Security guards	1106	1497	391	35	4	Short-term on-the-job training
Computer software engineers, applications	380	760	380	100	1	Bachelor's degree
Waiters and waitresses	1983	2347	364	18	4	Short-term on-the-job training
General and operations managers	2398	2761	363	15	1	Bachelor's or higher degree, plus work experience
Truck drivers, heavy and tractor-trailer	1749	2095	346	20	2	Moderate-term on-the-job training
Nursing aides, orderlies, and attendants	1373	1697	324	24	3	Short-term on-the-job training
Janitors and cleaners, except maids and housekeeping cleaners	2348	2665	317	14	4	Short-term on-the-job training
Postsecondary teachers	1344	1659	315	23	1	Doctoral degree
Teacher assistants	1262	1562	300	24	4	Short-term on-the-job training
Home health aides	615	907	292	47	4	Short-term on-the-job training
Laborers and freight, stock, and material movers, hand	2084	2373	289	14	3	Short-term on-the-job training
Computer software engineers, systems software	317	601	284	90	1	Bachelor's degree
Landscaping and groundskeeping workers	894	1154	260	29	4	Short-term on-the-job training
Personal and home care aides	414	672	258	62	4	Short-term on-the-job training
Computer systems analysts	431	689	258	60	1	Bachelor's degree
Receptionists and information clerks	1078	1334	256	24	3	Short-term on-the-job training
Truck drivers, light or delivery services	1117	1331	214	19	3	Short-term on-the-job training
Packers and packagers, hand	1091	1300	209	19	4	Short-term on-the-job training
Elementary school teachers, except special education	1532	1734	202	13	1	Bachelor's degree
Medical assistants	329	516	187	57	3	Moderate-term on-the-job training
Network and computer systems administrators	229	416	187	82	1	Bachelor's degree
Secondary school teachers, except special and vocational education	1004	1190	186	19	1	Bachelor's degree
Accountants and auditors	976	1157	181	19	1	Bachelor's degree

SOURCE: Hecker (2001)

Whereas we saw that 8 of the top 10 percentage growth occupations involved computers, only 2 of the top job growth areas involved computers, and only 3 of the top 20. Thus, one must be careful in using percentages alone. Growth in food preparation will be more than double the actual job growth of computer software engineering. A large percentage change in a small occupational niche can be deceiving.

Hecker (2001) also analyzed the workforce by education or training. Currently, 21 percent of occupations are held by those with BAs or higher, 17 percent by those with a two-year diploma, and 71.3 percent of those with work-related training (Exhibit 7). With consideration of Exhibit 6, this seems appropriate. Over the next 10 years, the percent of occupations filled by those with a BA or higher will increase by 1 percent, a modest increase at best.

Exhibit 7. Employment and total job openings, 2000–2010, and 2000 average annual earnings by education or training category

(in thousands of jobs)	Employment				Change			2000 mean annual earnings
	Number		Percent Distribution		Number	Percent Distribution	Percent	
	2000	2010	2000	2010				
Total, all occupations	145,594	167,754	100.0	100.0	22,160	100.0	15.2	33,089
Bachelor's or higher degree	30,072	36,556	20.7	21.8	6,484	29.3	21.6	56,553
First professional degree	2,034	2,404	1.4	1.4	370	1.7	18.2	91,424
Doctoral degree	1,492	1,845	1.0	1.1	353	1.6	23.7	52,146
Master's degree	1,426	1,759	1.0	1.0	333	1.5	23.4	43,842
Bachelor's or higher degree, plus work experience	7,319	8,741	5.0	5.2	1,422	6.4	19.4	69,967
Bachelor's degree	17,801	21,807	12.2	13.0	4,006	18.1	22.5	43,842
Associate degree or postsecondary vocational award	11,761	14,600	8.1	8.7	2,839	12.8	24.1	35,701
Associate degree	5,083	6,710	3.5	4.0	1,627	7.3	32.0	41,488
Postsecondary vocational award	6,678	7,891	4.6	4.7	1,213	5.5	18.2	31,296
Work-related training	103,760	116,597	71.3	69.5	12,837	57.9	12.4	25,993
Work experience in a related occupation	10,456	11,559	7.2	6.9	1,103	5.0	10.5	40,881
Long-term on-the-job training	12,435	13,373	8.5	8.0	938	4.2	7.5	33,125
Moderate-term on-the-job training	27,671	30,794	19.0	18.4	3,123	14.1	11.3	29,069
Short-term on-the-job training	53,198	60,871	36.5	36.3	7,673	34.6	14.4	19,799

NOTE: Detail may not equal total or 100 percent due to rounding

SOURCE: Hecker (2001)

People working in offices now hold 41 percent of the jobs in the United States and earn 50 percent of the income (Carnevale and Rose 1998). In 1995, these same office workers—managers, insurance agents, financial planners, and the like—earned 47 percent more than non-office workers (Carnevale and Rose 1998). The US economy that was once anchored by a strong manufacturing sector producing exports is now anchored by the “products” of the finance sector, the insurance “industry,” and real estate brokers. It is just as easy and much less expensive to make actual products outside the US (Carnevale and Rose 1998), so Americans now manage processes instead of making “things.”

This shift in the nature of the US economy has been very good for some segments of the population. Although there are still significant racial and gender gaps, blacks are better represented in higher quality jobs. According to Carnevale and Rose (1998), in 1959 only 14 percent of black men and 10 percent of black women worked in the office sector. By 1995 those percentages rose to 31 and 40 percent respectively. Women have also benefited because they are very well represented in office work,

but are underrepresented in manufacturing jobs. In 1959 only 4 percent of “prime age” women worked as business managers or professionals. By 1995, 15 percent were employed in those types of positions (Carnevale and Rose 1998).³

Not everyone is benefiting from the knowledge economy. A great and increasing divide exists between educated and under-educated labor. According to Carnevale and Rose (1998), the average earnings of elite jobs rose to \$58,600 between 1979 and 1995, earnings for good jobs dropped 7 percent to \$35,800, and earnings for less skilled jobs dropped 16 percent to \$24,000 (Carnevale and Rose 1998, p.18).⁴ Getting a college degree and getting an elite job is very beneficial and become more so, but for everyone who does not, and especially for those who do not get a four-year degree, the future is darkening.

According to Carnevale and Rose (1998), the new knowledge economy brings with it important political and social implications. The guiding philosophies of efficiency and accountability are not necessarily good for all people in all situations. Privatization as a route to efficiency is a challenge to government bureaucracy and traditional government functions. Unions are becoming less relevant and consequently less powerful. And, as mentioned earlier, income inequality is an unfortunate by-product of the system at its best.

PUBLIC BENEFITS

Not to be thwarted in their efforts either to support or challenge public investment, some economists and other social scientists have created clear definitions of economic benefits and shown how postsecondary investment leads the way. The Institute for Higher Education Policy (IHEP) suggests five clear economic benefits to investment in postsecondary education: increased tax revenues, greater productivity, increased consumption, increased workforce flexibility, and decreased reliance on government assistance (IHEP 1998). Some of these benefits could be considered two sides of the same coin, but IHEP, in citing census and labor statistics, eschews research based on large survey data for simply stating the facts. Regardless, economists have a solid history of attempting to account for the contribution of education to economic growth, many of them assert that the contribution does exist and is significant. Methodological debates abound in this area, leading to some to say that it is too difficult to know for sure if there is a connection to economic growth and, if so, what the magnitude is. Some researchers assert that the difficulty in measuring

³ It would be naïve to assert that these improvements are solely due to changes in the economy considering the massive social movements addressing race and gender inequality that occurred between 1959 and today. We assume that Carnevale and Rose would concede that those movements deserve credit—perhaps the vast majority—for increases in the participation of Blacks and women in formally all white, male professions.

⁴ From page 6 of Carnevale and Rose (1998): “the top tier of **elite jobs** holds the managers and professionals (with business professionals); the middle tier of **good jobs** contains supervisors in industrial and non-industrial settings, technicians, craft workers such as carpenters and plumbers, police, firefighters, and clerical and administrative workers; the bottom tier of **less-skilled jobs** requires the least education and training and is the lowest paid; it consists of factory operators, sales clerks, janitors, food service workers, and farm and industrial laborers.” [authors’ emphasis]

Getting a college degree and getting an elite job is very beneficial and become more so, but for everyone who does not, and especially for those who do not get a four-year degree, the future is darkening.

benefits to society is indicative of the possibility that no such benefits exist (Murphy 1993). The following paragraphs address the research findings in each of these areas.

PUBLIC BENEFITS RESULTING FROM INDIVIDUAL BENEFITS

Taxation. People with college degrees make more money and, therefore, pay more taxes via state and federal income tax. In addition, people with more disposable income spend more money than others resulting not only in spurring investment and the economy but also returning additional revenue to localities and states through sales tax. Consumption is the engine of the US economy.

Analyzing more recent data from many of the same sources as IHEP (1998), the College Board (Baum and Payea 2004) also asserts that there are public economic returns. The employment rates cited earlier can also be considered economic benefits for local and national economies. The tax revenues generated from high-income people are a public economic benefit; and the lower levels of social program spending reflect economic benefits for the public as well.

As illustrated in Exhibit 8, a professional who earns, on median, \$95,699 (2003), pay an estimated \$26,235 in taxes, including income tax, FICA, and state and local taxes. Conversely, a high school graduate who earns, on median, \$30,755 pays \$6,695, or less than one quarter the total amount of the professional. Put another way, it takes four high school graduates to pay the equivalent in taxation as one professional. A BA recipient earns approximately \$50,000 and pays \$11,940 in taxes.

Put another way, it takes four high school graduates to pay the equivalent in taxation as one professional.

Exhibit 8. Median Earnings and Tax Payments by Level of Education, 2003

	Total Median Earnings	Estimated Income Taxes	Estimated FICA Tax	Estimated State/Local Taxes	Total Estimated Taxes	Total Estimated After-Tax Income
Professional Degree	\$95,699	\$11,793	\$6,837	\$7,604	\$26,235	\$69,464
Doctorate Degree	\$79,403	\$8,790	\$6,074	\$6,358	\$21,222	\$58,181
master's Degree	\$59,508	\$5,531	\$4,552	\$4,809	\$14,893	\$44,615
Bachelor's Degree	\$49,889	\$4,072	\$3,817	\$4,051	\$11,940	\$37,949
Associate Degree	\$37,605	\$2,657	\$2,877	\$3,075	\$8,608	\$28,997
Some College, No Degree	\$35,714	\$2,434	\$2,732	\$2,923	\$8,089	\$27,625
High School	\$30,766	\$1,810	\$2,354	\$2,531	\$6,695	\$24,071
Less than HS Diploma	\$21,645	\$844	\$1,656	\$1,812	\$4,313	\$17,332

SOURCE: Baum and Payea (2004). Data from US Census Bureau. Data on state and local taxes from Institute for Taxation and Economics Policy, "Who Pays?"

In addition to tax data analysis, RAND developed an economic model to look at the benefit/cost of education public returns to education (Vernez, Krop et al. 1999). Vernez et al. (1999) modeled the costs of public assistance using Survey of Income and Program Participation data from 1990 and 1991 panels. The following illustrates some of their findings:

Welfare. According to Vernez et al. (1999), the cost of welfare per person drops significantly with increased educational attainment. For instance, the average annual

welfare cost for a white, non-Hispanic female high school dropout of age 30 was estimated at \$623 annually, compared to two-thirds that amount for a high school graduate and almost zero for a college graduate. Over 32 years, the discounted savings for a white, non-Hispanic female high school graduate compared to a high school dropout would total \$7,545 in 1997 dollars. However, it should be noted that the greatest impact on welfare reduction is between a high school dropout and a high school graduate. Higher levels of education further reduce the welfare burden, but the greatest percentage reductions occur between the two lower levels cited.

Medicaid. Vernez et al. (1999) also found that increases in education reduced the reliance on Medicaid. For women, regardless of race/ethnicity or naturalization status, receipt of a high school diploma reduced annual Medicaid spending by an average of \$400. Medicare spending for a college graduate as compared to a high school dropout was reduced by approximately \$550 and \$850 dollars, depending on the group. The reduction also was apparent for men, but at a ratio of about 1:3 of that of women.

All Public Assistance. Vernez et al. (1999) looked at the impact on spending on 10 programs with regard to education. These programs included federal and state unemployment insurance, Federal Supplemental Security Income, food programs (including food stamps), low-income energy assistance, Medicaid, Medicare, school breakfast and lunch programs, Social Security, Welfare (including Aid to Families with Dependent Children), and criminal justice (cost of jails and prisons). When their model was run, higher levels of education clearly affected the total annual per-person spending on public social programs for 30-year-olds. For non-white, native-born females, an earned high school diploma reduced public expenditures by over \$2,700 (1997 dollars), double that of white, non-Hispanic women. For Hispanic men, the amount was approximately \$4,000, while black men with a high school diploma saved the taxpayer \$7,000.

Exhibit 9. Savings in Public Social Programs and Increases in Tax Revenues and Disposable Income Associated with Discrete Increases in Educational Attainment for Native-Born Women Age 30 (1997 dollars)

	Asian	Black	Mexican	Other Hispanic	Non-Hispanic White
High School Dropout to High School Graduate					
Program savings	2,556	2,841	2,438	3,080	1,409
Tax revenues	2,378	1,819	1,843	1,951	2,295
Disposable income	3,397	2,487	2,588	2,655	3,376
TOTAL GOVERNMENT SAVINGS	4,934	4,660	4,281	5,031	3,704
TOTAL SAVINGS	8,331	7,147	6,869	7,686	7,080
High School Graduate to Some College					
Program savings	682	1,101	1,956	1,348	431
Tax revenues	1,834	1,339	1,398	1,428	2,691
Disposable income	3,152	2,307	2,401	2,463	3,132
TOTAL GOVERNMENT SAVINGS	2,516	2,440	3,354	2,776	3,122
TOTAL SAVINGS	5,668	4,747	5,755	5,239	6,254
Some College to College Graduate					
Program savings	625	1,065	411	843	278
Tax revenues	3,310	2,463	2,551	2,613	3,138
Disposable income	4,885	3,577	3,722	3,817	4,854
TOTAL GOVERNMENT SAVINGS	3,935	3,528	2,962	3,456	3,416
TOTAL SAVINGS	8,820	7,105	6,684	7,273	8,270
High School Dropout to College Graduate					
Program savings	3,863	5,007	4,805	5,271	2,118
Tax revenues	7,522	5,621	5,792	5,992	8,124
Disposable income	11,434	8,371	8,711	8,935	11,362
TOTAL GOVERNMENT SAVINGS	11,385	10,628	10,597	11,263	10,242
TOTAL SAVINGS	22,819	18,999	19,308	20,198	21,604
SOURCE: Modified by this report's authors from Vernez et al. (1999), p. 142, Table D.1.					

Exhibit 9 breaks out the savings in public programming costs, increases in tax revenues, and increases in personal disposable income for native-born women aged 30, by race/ethnicity, using the RAND model. In addition to the reduction of government spending of over \$2,700 for non-white, 30-year-old native-born women, high school graduates paid approximately \$2,000 in additional taxes compared to high school dropouts, and had \$2,800 more in disposable income. All combined, total net effect of reduced government support, paid taxes, and earned disposable income was about \$7,000 per person per year across all race/ethnic groups.

The differential between high school dropouts and college graduates is much higher. The average total program savings was \$4,700. Non-white college graduates paid \$6,200 in taxes, and white, non-Hispanic women paid \$8,100. Thus, the total government savings for a college graduate as compared to a high school dropout was in excess of \$10,000. With disposable income added in, total net return was around \$20,000.

EDUCATION AND ECONOMIC GROWTH

While the preceding data seem very straightforward and convincing, some argue about whether there is a link between higher education and economic growth, which could be considered a more pressing economic issue than these short-term economic returns. True, earnings are higher for postsecondary graduates relative to non-graduates, but does this translate into economic growth? Beginning in the 1960s, economists attempted to measure the impact of education on economic growth. Growth accounting is not specific to higher education, but is the forbearer of discussions in this area. The work of Becker, Schultz and Denison began the conversation and is still a main point of reference for research some forty years later. In brief, this early work suggests that there are economic returns to education in the form of labor productivity and by extension economic growth.

In a more recent book edited by Becker and Lewis (1993) focusing on higher education, several scholars take up the questions earlier research made possible, but in most cases research addresses postsecondary contributions to economic growth through three areas: production of knowledge, diffusion of knowledge, and transmission of knowledge. Knowledge is produced by faculty members and advanced graduate students. It is diffused by the work of those individuals outside the university, for example, within government and industry. And knowledge is transmitted through teaching.

The production and diffusion of knowledge are acknowledged but they are not often measured in any systematic or unambiguous ways. According to Becker and Lewis, production is thought of first as the number of years a person has accumulated in school, but this line of thinking does not consider quality. One area of thought on production concerns basic research and development. The contribution of basic and applied research to the economy is widely recognized and undisputed according to McMahon (1993). The problem is not understanding that there is an impact but finding a way to measure it. Some studies, he says, can find significant effects from research and development on specific industries but not on productivity.

The measurement problems McMahon (1993) cites are numerous. First, the time between investment and outputs is too long both where the development of an idea and its application and the education of students and their entry into the field are concerned. Second, this lag time makes it difficult to measure impacts over short periods of time. Third, it is also difficult to separate the impact of research and development from the actual people who are trained to do the work and use the technology once it is applied. Fourth, universities are not the sites for research and development. They do conduct more than half of the basic research that is developed by industry, but it is challenging to separate the impact of basic research and research and development at a university on growth. This is further compounded by the fact that universities train all of the people conducting the research and development at the industry level. Finally, there are major undisputed externalities according to McMahon. He states that it is unwise to use the earnings of scientists because earnings are depressed by the lag time mentioned earlier concerning basic research dis-

True, earnings are higher for postsecondary graduates relative to non-graduates, but does this translate into economic growth?

coveries and development for application. Scientists, he suggests, are like artists; their work is not often rewarded before they die.

Regardless of the challenges, McMahon (1993) does attempt to estimate a rate of return. Using data from the OECD nations, McMahon estimates that “the 7 percent to 9.7 percent real rate of return [that he found] to human capital formed by higher education are quite respectable when it is realized that these must be augmented by the contributions of academic R&D” (p. 123).

While production and diffusion are less popular subjects of research, transmission of knowledge is very widely studied. Although the early growth accounting work paved the way for future research, Pencavel (1993) asserts that “arbitrary methods” are used to produce “fragile results.” This does not take away from his opinion that the findings that abound do point us in the direction of believing that education contributes to economic growth. This is especially so when industry level measures are used. It is not possible, according to Pencavel, to calculate a correspondence between schooling and production, but it is reasonable to expect such a relationship to exist.

Reviewing the literature, Pencavel (1993) finds that there is sufficient evidence to support the idea that “rising schooling completion” contributes to economic growth for two reasons. First, there are correlations across nations between economic growth rates and school enrollment rates, and second, US technological industries experienced rapid growth and employed well-educated labor at high rates. In the end, it is still difficult to determine the exact impact of postsecondary education on growth.

Along a related line of reasoning, Aschauer (1993) suggests that if it is true that public investment in capital positively affects productivity and economic growth, then it is necessary to consider government spending as public investment when appropriate and not solely public consumption. Although a prior Aschauer study found that investment in physical educational capital (education buildings on university campuses) had no statistical impact, investment in human capital may prove a worthwhile capital investment.

The results of Aschauer’s (1993) cross-national study show how nations that invest in both tangible and intangible educational capital have higher levels of educational output and thus productivity. According to his results, educational capital constituted 15 to 20 percent of productivity, just over half the estimate of 42 percent found in growth accounting, which has been discounted as overstating the effects of education. The rate of return in this instance is 9.4 percent.

At the beginning of this discussion, Becker and Lewis (1993) were cited as saying that quality of education is not widely discussed in the work on economic returns to education. Solmon and Fagnano (1993) speak directly to the conflict between what some say are obvious economic benefits especially at the individual level (and socially if one considers the aforementioned areas of taxation, welfare reduction, etc.)

and tight state budgets. If we agree that investments in education offer public economic benefits, then we would want to maintain the highest level of investment possible. But what does that mean when funds are limited?

Solmon and Fagnano (1993) suggest that quality be considered. "If certain elements of colleges or universities are seen to increase students' postgraduate productivity, and so increase economic growth, and if the latter is the reason for public subsidy, then it is important to identify these aspects in order to spend public funds effectively (p. 150)." Inherent in this statement is the understanding that not everything a student experiences or gains at the postsecondary level contributes to economic productivity. How then do we go about determining what does contribute and to what degree?

Researchers use four ways to measure quality: inputs, processes, outcomes, and value-added (Solmon and Fagnano 1993). Listing the relevant inputs and determining their value is one method of determining quality. Inputs such as the quality of students and faculty, faculty/student ratio, physical plant, can be given monetary value. The assumption is that better quality inputs cost more money. It is important to note that under this method, inputs do not include all expenditures in the budget because not all expenditures reflect quality.

Quality measured through process very much like the previous method is based on the assumption that higher quality processes are more expensive. Class size and quality of teaching, based on who is teaching (faculty, adjunct, graduate student, and so on) and the frequency of faculty/student contact constitute the kinds of processes that would be measured using this method.

The third measurement method, outcome measurement, is arguably the most popular. It considers retention, persistence, academic achievement, alumni achievement, etc. Solomon and Fagnano (1993) point out that this method is inherently problematic because privilege begets privilege. The alumni achievement variable embodies not only what individuals gain while at an institution but also all their families' connections and influence.

The final measurement method discussed by Solmon and Fagnano (1993) is value-added. This method asks that researchers determine a means of measuring what change at the institutional level is brought about for the students. The authors offer an example of Graduate Record Exam (GRE) scores for consideration. Two schools produced GRE scores of 1300 and 1000 respectively. The first school performed 100 points better than would be predicted, but the second school scored 300 points better. In this model, the second school with the lower GRE scores would be considered a higher quality school. As is generally the case, there are measurement challenges here. It would be important to determine where ceiling effects began to occur so that the improvements at the top of the scale are appropriately valued.

Solmon and Fagnano (1993) conclude by suggesting that including quality in analyses of returns to postsecondary education is a necessity because there are signifi-

If we agree that investments in education offer public economic benefits, then we would want to maintain the highest level of investment possible. But what does that mean when funds are limited?

cant differences in the type and quality of schools throughout the country. If important policy decisions are going to be made about where to invest, it would be unwise to move forward without considering quality.

The previous discussion about the context in which states find themselves concerning tight budgets and declining state support of higher education is also found in the literature on returns to education. Jones and Vedlitz (1993) argue that state higher education policies “influence net creation of new businesses [directly] but not new employment.” This does not mean that employment is not created. Business creation leads to employment creation, but the authors make it clear that employment creation does not lead to business creation. Overall spending, according to their study of data from 1979 to 1984, was very much related to economic growth. Thus, investment in higher education stimulates economic growth, according to the authors.

More recently, Trostel (2003) echoed this sentiment. His central thesis that “the supply of college-educated labor creates its own demand” suggests a geographic element to regional development. Trostel argues that the location of high technology corridors and research parks is not arbitrary. They are located near research universities because that is where the knowledge resides. According to his early calculations, states do reap the benefits of their investments in individuals as well. He disputes the brain drain argument where students leave states because of a lack of applicable jobs, suggesting that graduates stay and are part of the creation of new industry. This idea supports the Jones and Vedlitz’ (1993) findings.

Analyzing data at the metropolitan level, Gottleib and Fogarty (2003) find that having more people with bachelor’s degrees in a metropolitan area has a positive impact on economic growth. Their analysis seems at first to be a “death knell” to large urban areas with no or low quality higher education institutions, but the authors argue that this is not the case. There is a way, they say, to import and create degree holders. Cities must find ways to improve the quality of higher education institutions within their metropolitan boundaries. Such institutions draw highly educated populations and create opportunities for existing populations if changes are made at the K-12 level to ensure readiness of the cities’ students to enter quality institutions.

While US researchers have been working for decades to determine the value of returns to education in general and significantly less time on the same question concerning postsecondary education, it was difficult to determine if there are US scholars who think such endeavors have served their purpose and have outlived their usefulness. Some UK scholars seem to feel that this research is deeply flawed and misguided. It appears that the most vibrant discussions about the futility of trying to measure public benefit from public investment in higher education are emanating from the UK. Why this may be the case is addressed in the concluding section of this paper.

In 1993, Murphy published a review of the literature concerning the social value of increased investment in tertiary education. “A degree of waste: The economic benefits of educational expansion” asserts that there is no evidence in the literature to

Overall spending, according to their study of data from 1979 to 1984, was very much related to economic growth. Thus, investment in higher education stimulates economic growth, according to the authors.

support what has become almost a religious belief in the economic benefits of expansions in tertiary education. He writes that there are three problems with the belief, suggesting that it “(1) greatly overstates the country’s requirements for graduates; (2) seriously inflates the significance of graduates in fostering economic growth; (3) grossly exaggerates the capacity of education to mould labour in economically advantageous ways.”

After examining the literature, Murphy (1993) continues by revisiting some of the data used in prior studies and comes to his own conclusions. Commenting on literature suggesting shortages in graduates, Murphy counters by citing data showing that highly educated people were unemployed at rates of 10–20 percent for six months after graduation. He also admits that the UK economy does a commendable job of absorbing what could be considered its overeducated population. He then refutes the literature which suggests that nations with higher rates of graduation from tertiary institutions enjoy higher rates of economic growth. The data, according to Murphy, do not support such findings. In critiquing Murphy, Johnes (1993) lists the highest growth rate countries (at the time of the study) as the US, Japan, and Germany (with tertiary entry ratios of 70, 51, and 29 percent, respectively). While Johnes suggests that these data prove the point that high participation contributes to high growth, he fails to mention that the UK entry rate was 21 percent. Murphy correctly surmises that if Germany, with 29 percent participation rate, enjoys a third place growth ranking above many countries with higher participation, and the UK enjoys a very similar participation rate and a dissimilar growth rate, perhaps tertiary participation is not a key factor in economic growth.

On the third point of education molding labor in economically advantageous ways, Murphy (1993) suggests that the labor market must accept the products of tertiary education because students choose to follow certain educational paths regardless of the labor market. As well, the market does not value all degrees similarly. Those from more prestigious institutions are always more valuable than degrees from less prestigious places regardless of academic discipline, thus also influencing the labor market. He also cites research showing that gender and age contribute to labor market responses differently at different times.

As previously mentioned, Murphy’s (1993) analysis does not go without criticism. At the heart of the exchange between Murphy (1993; 1994) and Johnes (1993) is a discussion about data and measurement techniques. It would appear that both scholars agree that how the educational contribution to economic growth is measured is deeply flawed. Where Johnes seems to embrace thinking that would suggest we can only use what we have, Murphy asserts that the difficulty in measuring effects implies that no such effect exists.

In an examination of the human capital foundations of arguments about the contributions of higher education to economic growth, Ashworth (1998) chose an empirical route. He tests the presumption of economic growth due to education and examines “the distribution of the rewards from growth.” Focusing on *average* and *marginal* graduates, the study produced findings suggesting that individuals will always bene-

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fit, but the benefits to society are so small that investments might be better used elsewhere. This supports Murphy's (1993) assertions that spending on expansions in higher education has long passed the investment state and now can only be considered consumption.

Of course, how Ashworth (1998) measured the contribution of education to growth is up for debate as there are no completely acceptable means to do so. Ashworth's study chose not to calculate rates of return in the more common way, which according to Ashworth, employs survey data and then infers alternative earnings from other members of the cohort. He chose, however, to simulate the position of representative students. This method allows Ashworth to avoid the pitfall of standard measures of rates of return which rely on existing, static data when what is being measured is dynamic.

In more recent publications, Wolf (2002) takes this discussion to a new level by simply stating, without apology, that the idea of increased higher education contributing to economic growth is a myth. In *Does education matter? Myths about education and economic growth*, the University of London professor lays out various myths and discusses just how weak they are as arguments. In one instance, discussing the aforementioned issue of measurement, Wolf states, "We cannot use rates of return to prove that more educational spending must be a good idea. On the contrary: it is no more self-evident that, since some education makes some of us rich, more would make more of us richer than it is that 'two aspirin good' means 'five aspirin better'" (p. 28). Furthermore, in "Education and economic performance: Simplistic theories and their policy consequences" (2004), Wolf points out how adhering to such beliefs leads to poor policy. Specifically, she highlights target-driven policies that have adverse effects on educational quality.

Wolf's (2002; 2004) policy discussion is of particular importance because it highlights the impact that higher education policy can have on K-12 institutions. Without going into the specifics of UK policy, which can only in part be compared to US policy, it is useful to note that policies purporting to get more students to stay in high school and matriculate upon completion can work against policies to introduce skilled labor into the market as soon as possible. This speaks directly to expansions in vocational education at the secondary level in direct opposition to universal preparation for four-year postsecondary programs. The production of skilled labor has direct and measurable implications for labor-market impact on the economy. Wolf and others suggest that the entirety of tertiary education does not offer such a clear link.

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PART III. NON-ECONOMIC RETURNS

Economic returns are of primary concern because of the economic investment that is made. But it is also unclear where non-economic returns fall in relation. In his discussion of the sheer impossibility of using aggregate data to determine economic returns to education nationally or cross-nationally, Pritchett (2004) closes by stating that a lack of economic returns or the ability to measure them is insufficient grounds for disinvestment. He speaks of a moral obligation to educate people because of the obvious social benefits. While Pritchett writes about K-12 education in developing countries, it is reasonable to argue that his statement applies to postsecondary education in the United States because families must pay for secondary schooling in the countries he is studying, where payment is not required of American families until postsecondary education.

There are difficulties in measuring the general non-economic benefit just as there are for the public economic benefit. Is a society better off if all the individuals in that society have an equal opportunity to reap the economic and social benefits of education but do not? Are there generally enjoyed externalities to having a largely highly educated population? Or does the competition to gain more education diminish the value of lower levels of education and skew the overall benefits? These are the kinds of questions that challenge researchers interested in measuring non-economic benefits to educational investment. As demonstrated in the sections that follow, researchers are not rising to the challenge and are instead asking questions that are sometimes peripheral to the larger topic of non-economic benefit.

PRIVATE BENEFITS

Non-economic benefits for individuals tend toward basic quality of life variables described by IHEP (1998): increased life expectancy (Feldman, Makuc et al. 1989), improved quality of life for offspring (Dawson 1991; An, Haveman et al. 1993; Ribar 1993), and increased personal status (Terenzini 1996).

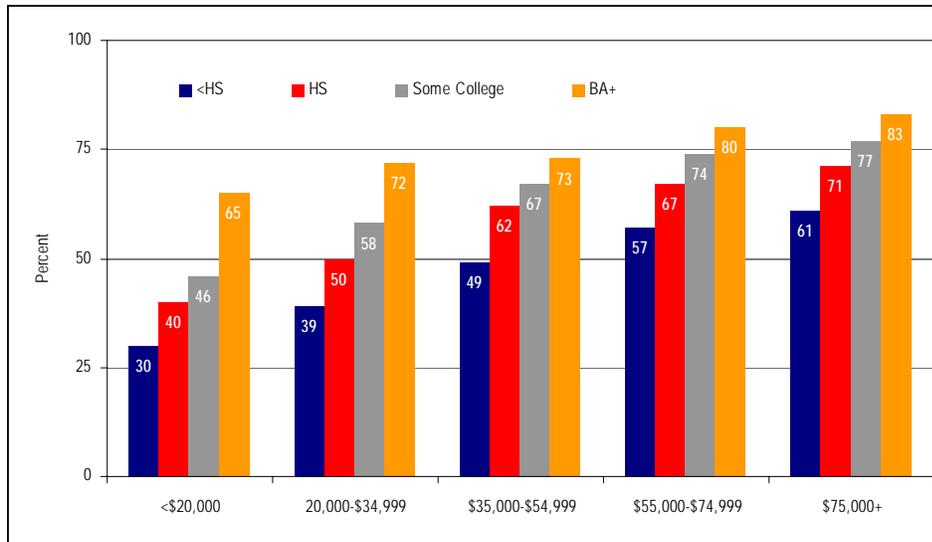
As cited in IHEP (1998), studies by Dawson (1991), An et al (1993), and Ribar (1993) show that parents who have attended college have children with better quality-of-life indicators. The children of parents who have graduate from college are more likely to graduate from college and have higher cognitive development. And mothers who graduated from college are less likely to have daughters who become teen mothers.

People who graduate from college are also in a position to enjoy greater social status, which is, in part, a result of greater economic status. These individuals enjoy status indicators such as better employment and opportunities for more prestigious work (IHEP 1998). It is also true that first-generation college graduates enjoy a particular bump in personal status as leaders within their families (Terenzini, 1996).

These types of benefits are heavily value-laden, which makes it difficult to ascertain whether they would be equally important to all potential investors in postsecondary education. If individuals value these things, they can certainly have better access to them through the attainment of a postsecondary degree. Postsecondary education is not, however, the only way to gain access to this list of benefits.

The College Board expands on this list and suggests one private social benefit that may not be as value-laden: health. In every income level and age group, people with bachelor’s degrees report that they are healthier. The choice to disaggregate by income level helps to dispel what could be a concern that earning more puts one in a better position to take care of one’s health. The study shows that even those with bachelor’s degrees earning very little, less than \$20,000 a year, report themselves healthier than do those with some college.

Exhibit 10. Reporting Excellent or Very Good Health, by Income and Education Level, 2001



SOURCE: Baum and Payea (2004).

PUBLIC BENEFITS

When millions of college-educated people are inducted into a society, they are bound to affect that society. Similarly, when the ideas derived from the intellectual-artistic pursuits of the academy make their way into a society, these ideas are bound to influence the course of social development. Higher education thus sets in motion a dynamic process leading to changes in society, which in turn will lead to further changes in both individuals and society. (Bowen 1977)

Non-economic benefits to a society are somewhat amorphous and difficult to evaluate. It appears that researchers jump immediately to civic returns specifically, choosing to focus on one type of societal return. Dee (2004) asks the question explicitly: Are there civic returns to education?, while Putnam (1995; 1995) uncovers a relationship while attempting to understand where social capital has disappeared to in the United States. The findings of these two scholars reveal a dilemma in American civic life.

In an attempt to understand why individuals in the U.S. seem more isolated today than they did in the post-WWII years, Putnam (1995a; 1995b) embarked on a study of American civic society. He asked, who votes? Who is involved in civic organizations and clubs? A basic assumption in his work is that it is better to be involved in society than to be “bowling alone.” This point is debatable, but does have some grounding in the basis of a democratic society. During his analysis, Putnam found that education is more significantly correlated with civic engagement than any other variable. Putnam’s (1995; 1995) finding of a significant correlation between educational attainment and civic engagement is supported by the work of Dee (2004). Using the national datasets *High School and Beyond* and *General Social Surveys*, Dee found that higher educational attainment positively affects voter participation, group memberships, attitudes toward free speech, and newspaper readership, which he uses to define civic awareness. If one agrees that these are social benefits, then Dee has found that higher levels of attainment benefit society.

There are four important issues to note in these studies. The first is that Dee (2004) finds that benefits accrue at the enrollment stage in postsecondary institutions. That is to say, people enrolling in two-year institutions, regardless of whether they graduate, show greater civic engagement. This point does not support greater public investment in postsecondary education, but it does support improving the quality of secondary education because this finding, in conjunction with Dee’s finding that individuals at higher levels of secondary schooling show more civic engagement than those at lower levels, means that something begins to happen in the later years of secondary schooling on which a society might capitalize.

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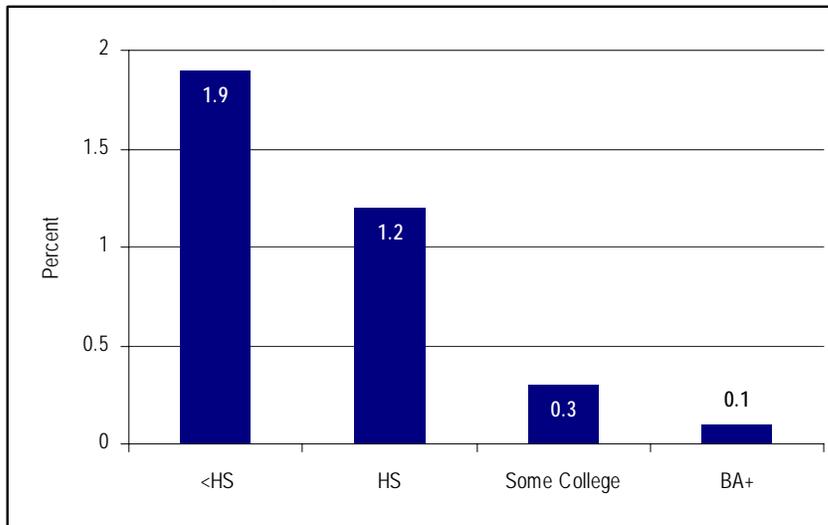
The second important item of note is that Dee does not address issues of socioeconomic status in his study. Third is the issue of race (Putnam 1995; 1995). Blacks are found to be very engaged in community-specific activities and groups, but disengaged from the larger society. Therefore, the degree to which educational attainment leads to greater racial cohesion could be called into question.

And finally, it is important to note why Putnam undertook his study. He was, as stated earlier, concerned with the level of social disengagement in the period following WWII. The irony in his finding that educational attainment is significantly correlated with civic engagement is highlighted by the fact that access to higher levels of educational attainment was greatly increased in the period following WWII. Putnam acknowledges this and suggests that investigations be made into what is muting the effects of education on civic engagements.⁵

Turning again to the College Board Report (Baum and Payea 2004), however, we find that there is support for the ways in which higher levels of education benefits society in addition to (and including) potential civic returns. These benefits include lower incarceration rates,⁶ volunteerism, and democratic participation.

Incarceration. Only one-tenth of one percent of people with bachelor's degrees were incarcerated in 1997, while 19 times as many high school dropouts were incarcerated and 12 times as many people with only high school diplomas were imprisoned (Baum and Payea 2004).

Exhibit 11. Incarceration Rates by Education Level, 1997



SOURCE: Baum and Payea (2004).

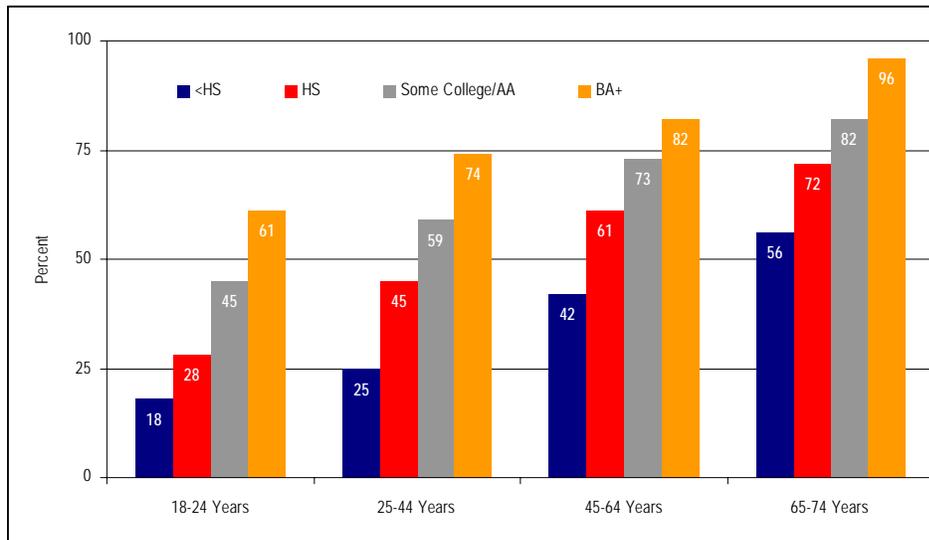
Volunteerism. People with bachelor's degrees volunteer more with a median of 60 hours of volunteer work per year (Baum and Payea 2004). Those who stop schooling at high school volunteer fewer than 50 hours. Most interesting about these statistics

⁵ His own investigation points to television viewing.

is that 45.6 percent of bachelor's degree holders are volunteering many hours, while only 21.7 percent of those with high school diplomas are volunteering. Volunteerism is an indication of both the time that people have to commit to others in their communities, but also the sense of connection they have. This idea, social capital, is of central concern in Putnam's work.

Voting. Voting is the civic benefit that IHEP (1998), the College Board (Baum and Payea 2004), Dee (2004), and Putnam (1995) point to as crucially important. Voting increases steadily with additional years of education, through the bachelor's degree.

Exhibit 12. Reported Voting Rates by Age and Level, 2000



SOURCE: Baum and Payea (2004).

One must be cognizant, however, that all data reported here are average or median values. Bowen (1977) makes clear that not all that is higher education is good and proper, and that one must carefully evaluate all outcomes for all students:

In its effect on students, higher education may produce some liars, cheats, and con men; it may foster tendencies toward exploitation of other people; it may enhance the capacity of people to employ intellectual jargon for purposes of rationalization and deceit; it may foster indolence in some people; it may cause contempt for the Puritan virtues of thrift and hard work; it may deaden rather than quicken the love of learning; it may offer a shelter that retards maturation; it may produce unfortunate personality traits such as arrogance or superciliousness; it may encourage drug abuse and excessive use of tobacco and alcohol; it may demoralize students who fail or who achieve low social or academic ranking. By enlarging the opportunity and raising the social status of those who are college-educated, college education may correspondingly restrict the opportunity and social status of the less-educated. (Bowen 1977, p. 50).

⁶ This could also be considered an economic benefit, if one thought of the incarcerated as lost human capital.

In the two preceding sections we reviewed the research on economic and non-economic returns to education for individuals and society. Each area has its own body of research and group of researchers, but two authors suggest that these should be combined to gain a full understanding of the just how valuable continued schooling may be. Although their paper is not solely concerned with higher education, the discussion does offer some potentially valuable information. After reviewing the literature and conducting a form of meta-analysis, Wolfe and Haveman find that “full social gains from additional schooling exceed—perhaps significantly—the 7–9 percent private rate found in the returns-to-schooling literature” (p. 119). They suggest that the full rate of return could be as much as 14–18 percent. This is still respectable in light of the overestimation of the growth accounting literature but twice as high as the new standard finding.

Wolfe and Haveman (2002) assert that their findings suggest a reallocation of funds to the education sector, including all levels, K-16. As for who should pay for this reallocation of funds, the authors seem inclined to suggest that because private benefits are so high individuals should pay; but they are well aware of income inequality and support targeted aid for those who cannot pay and are not capable of borrowing. Although aid research is beyond the scope of this paper, it is important to note that enrollment rates are negatively associated with tuition rates, so requiring individuals to pay through this method, may prove counter-productive (Heller 1997).

PART IV. AREAS OF CONFLICT

Two streams of thought about increasing participation in postsecondary education conflict with each other. One considers the need for expansion and attempts to cost it out creating a cost-benefit analysis of making sure that all groups have equal access to postsecondary education. The other considers the singular focus on postsecondary expansion naïve and shortsighted and suggests that education needs to focus on the needs of individuals and families and make pathways to economic independence clearer recognizing that postsecondary education is not the only way.

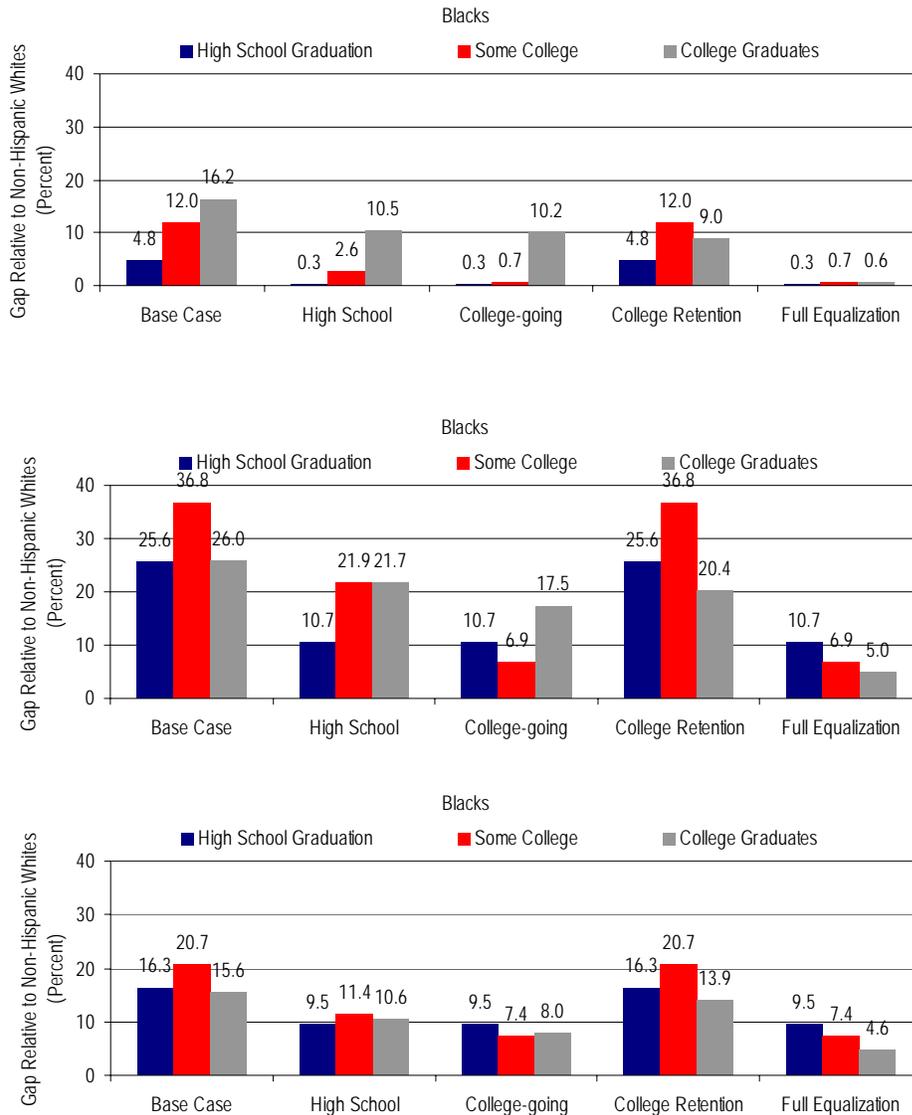
THE COST OF MAKING CHANGE

The studies presented in this report address the returns of education to the individual and to society as a whole. If there is a case to increase social equity in the nation, and also support the nation's interests in remaining globally competitive, then there is a cost to consider. It is difficult to come up with an accurate estimate of the net cost of increasing the percentage of students who enroll and complete higher education due to the numerous factors involved. RAND, however, explored the benefit-cost relationship of attaining equity by race/ethnicity in California and the nation (Vernez, Krop, and Rydell, 1999). RAND developed a statistical model to determine what would happen if the gap of underrepresented minorities and whites were eliminated in four areas: high school completion; college-going rates, college completion rates; and full equalization across all areas, meaning that equity is attained at each education level. The model considered a 1990 cohort and estimated outcomes in 2030, when the cohort was 40 years old.

Exhibit 13 illustrates the impact of equalizing these various rates on the educational outcomes of blacks, Mexicans, and other Hispanics in California. If high school graduation rates were equalized, the gap in college going and college completion rates would be reduced significantly for all groups, especially for black groups. Under this scenario the high school graduation rate gap is still positive for Mexican and other Hispanics due to impact of continuing immigration. Black students, however, do see the gap in high school graduation reduced to almost zero. Also under this scenario, we see that the college graduation gap is reduced from 16.2 percent to 10.5 percent for blacks, 26 percent to 21.7 percent for Mexicans, and 15.6 to 10.6 percent for other Hispanics. Thus, equalizing high school opportunity has impacts for postsecondary education access, although not as much for students of Hispanic origin as compared to black students.

If there is a case to increase social equity in the nation, and also support the nation's interests in remaining globally competitive, then there is a cost to consider.

Exhibit 13. Projected Gap in Educational Attainment for Blacks and Hispanics Relative to Non-Hispanic Whites under Alternative Goals, California, Cohort Age 40 in 2030



SOURCE: Vernez, Krop, and Rydell (1999), p. 61, Figure 5.1.

When the next scenario is applied, which involves equalizing high school completion and college-going rates, the gap between white and black college graduation rates is reduced to 10.2 percent. For Hispanic students, the college graduation rate gap is reduced to approximately 17.5 percent for Mexicans and 8 percent for other Hispanics. Finally, if full equalization is provided—that is, the high school graduation, college-going, and college completion rates are equalized across race/ethnic groups—the black/white gap at all three check points is marginalized, while the Mexican and other Hispanic gap is reduced to approximately 5 percent.

This analysis does not suggest how to do this, but does suggest, at least statistically speaking, what impact these various efforts would have if implemented. Under the full equalization plan, the share of Mexican 40-year-old college graduates in Califor-

nia would nearly quadruple, from 8 to 29 percent, and the share with some college would increase from 37 to 67 percent.

Vernez et al. (1999) calculate that the cost of full equalization at approximately 21 percent above the base cost of education in California (\$9 billion annually in 1997 dollars) and 8 percent in the rest of the nation (\$14 billion annually). The cost of equalizing at the college-going level is about three quarters that amount, and approximately half for equalizing the high school graduation rate. Although their assessment is based on a respectable statistical model, we perceive these numbers as low targets due to the complexity of changing both the education system and other, non-education factors that impact education.

As a final analysis, Vernez et al. (1999) measured the benefit/cost of reaching alternative education goals for Californians and the rest of the nation. To equalize high school completion, the public savings, in the form of lower expenditures for public income transfer and health programs and higher tax contributions, was such that for each \$1 spent in California, \$2.4 would be saved (1997 dollars). When disposable income was added into the mix (societal ratio), the ratio increased to \$1 to \$4.6. When the full equalization was modeled, the public ratio was 1:1.9, and the societal ratio 1:4.1.

TOO MUCH EDUCATION?

The literature discussed to this point addresses the investment in postsecondary education and the benefits of that investment. In this section, we discuss the costs of increased investment in postsecondary education to both individuals and the larger society. Current discussions about increased access to postsecondary education have their roots in two previous educational expansions. The expansion of secondary education made high school diplomas almost ubiquitous, and the expansion of postsecondary education in the 1960s devalued those diplomas (Collins 1979; Rosenbaum 2001).

Collins (1979) termed this expansion a credential crisis. It is not that high school diplomas became worthless during this period, but that more people, including previously disenfranchised and undereducated population, gained access to better credentials. Once high school diplomas were ubiquitous, it became necessary for a higher level of differentiation to maintain social stratification. Collins suggests that as a society we would be better off by putting a stop to requiring certain credentials for jobs and instead require a set of skills or competencies using apprentice and training systems. He also conceded in 1979 that this would not happen until everyone was convinced that the current system was doomed to failure. That has not yet happened.

Rosenbaum (2001) also vigorously questions the notion that postsecondary education is, indeed, the best means to individual financial security and national productivity. In *Beyond College for All*, Rosenbaum argues that there are jobs for which a postsecondary degree is useless, and that a close relationship between high schools and industry could solve two problems. First, it would give meaning to high school diplomas, and second, it would reassure employers that they are getting qualified and skilled employees. Rosenbaum goes on to enumerate other benefits to his plan, such as better academic achievement at the secondary level due to recognition by students of the value of high school.

Both Collins (1979) and Rosenbaum (2001) point out a basic flaw in the assumptions underlying increasing requirements of postsecondary degrees and highlight the resulting negligence of/in K-12 systems and those who are not going to complete postsecondary study. This includes the people who are becoming farther and farther removed from decent earnings in the workforce described by Carnevale and Rose (1998). In *Education for What?* Carnevale and Rose (1998) describe a great and growing divide between those with four-year degrees and those without. And in *Help Wanted...Credentials Required*, Carnevale and Desrochers (2001) explain how employers in the knowledge economy are propelling this phenomenon forward.

The current concentration on credentialing is being driven by a “systemic shift in our society toward performance measurement and performance standards in human capital development” (Carnevale and Desrochers 2001, p. 41). Certifications and

Collins suggests that e as a society we would be better off by putting a stop to requiring certain credentials for jobs and, instead, require a set of skills or competencies using apprentice and training systems.

Workers who...have a solid base of general knowledge and current occupational know-how become more portable, since [sic] their value is internalized in their individual experience and credentials and not tied to a particular company. An associate or bachelor's degree is more likely than a high school diploma to ensure those basic transferable skills. (Carnevale and Desrochers 2001, p.43).

Whether they recognized it or not, Carnevale and Desrochers (2001) have, in addition to describing why the role of community colleges is changing, also explained why the issue of skills may not necessarily fall solely into the realm of postsecondary education.

A different-but-related conversation among researchers is that surrounding the over education of citizens. Freeman (1976; 1980), Rumberger (1981; 1987), Verdugo and Verdugo (1988; 1989; 1992) all assert that four-year and graduate degrees and additional certification can actually be a detriment to some people in the labor market. They also suggest that the increasing number of people having degrees and certifications causes the value of those degrees to decline.

As stated earlier, Freeman (1980) found that the average wage of white male degree holders was falling, a finding supported by a separate study by Rumberger (1987). These findings were of particular importance because white males have always been positioned at the top of the earnings distribution. If they were beginning to experience decreases in their earnings, then so was everyone else. Verdugo and Verdugo (1998) found this to be the case when they could not distinguish between the earnings of overeducated blacks, Puerto Ricans, and other Hispanics and sufficiently-educated individuals from the same groups. There is nothing shocking about these findings as they fit firmly into classic economic theories of supply and demand, but their work brought on considerable criticism.

Many of the criticisms come down to methodological debates, and it is difficult to determine who to believe (Rumberger 1987; Cohn 1992; Gill and Solberg 1992; Verdugo and Verdugo 1992). Over time, the wage of white males with bachelor's degrees and above did decline (Rumberger 1987). Additionally, men of color are disproportionately penalized compared to white men (Verdugo and Verdugo 1988). The authors do not refute the fact that having a four-year degree or more—and in some cases less—makes one better off than only having a high school diploma, but they do point out that individual marginal benefits do not exceed the marginal cost of additional years of schooling.

More recently, however, Trostel (2003), in a peripherally-related paper, states that over-education proponents were wrong. Citing Crawley et al (2000), he states that individual economic returns to college were declining when Rumberger (1987) did his original studies, but during the 1980s and 1990s these returns were rising, which denotes that the demand for college-educated labor outpaced supply.

Looking specifically at data from the US labor market, Rothstein's (2002) analysis falls squarely in line with those cited in this section arguing that overall skill growth required by future occupations will be modest, and that although many opportunities will present themselves in the technologically-related fields, many more opportunities will be created in the service industry which requires little or no postsecondary education. Although we may have some shortages in skills, Rothstein suggests that many college graduates are overeducated for the tasks performed on the job:

Education levels of the workforce have been rising in step with the demand for skills...What puts our understanding out of balance is the way we have wildly exaggerated these trends. Over the last 30 years, the share of the workforce with a college degree (now about 27 percent) has been growing by about 2.5 percent each decade. Over the next decade, changes in the occupational structure can be expected to generate the need only for another 1 percent of the workforce to have a college education. (Rothstein 2002)

According to Rothstein (2002), one must beware of labor force estimates as a foundation for expanding or contracting higher education. He notes that before the dot-com bubble burst, there was a glut of science and mathematics graduates, with unemployment rampant at those levels. This resulted in lower wages for certain industries. For example, Rothstein notes that a computer science graduate earned \$39,000 in 1986 but only \$33,000 (constant dollars) in 1994. He concludes by citing analysis by Mishel and Teixeira (1991) that found an individual entering the workforce in 1990 required only one-fourth a grade level more education than a retiring worker who entered the workforce in the mid 1950s.

The shift from a blue collar workforce to one that is more office oriented is a trend that has gone on for the past half century. Autor, Levy, and Murnane (2003) found that blue collar workers, who represented approximately 38 percent of the entire workforce in 1969, accounted for only one quarter of the workforce by 1999. The primary increases over those three decades occurred in professional occupations, management, sales, and technicians.

The outlying argument is whether postsecondary education provides a credential or a skill necessary for today's and tomorrow's workforce. Autor et al. (2003) analyzed the cognitive skills required for the workforce between 1969 and 1999, finding that "expert thinking" and "complex communication" increased by 14 and 8 percentile points respectively, while jobs requiring routine cognitive, routine manual, and non-routine manual tasks declined approximately 3, 5, and 8 percentile points. They summarize that jobs providing higher wages require higher-level thinking skills. Certainly a higher education can provide necessarily development in this area, but it also follows that

An individual entering the workforce in 1990 required only one-fourth a grade level more education than a retiring worker who entered the workforce in the mid 1950s.

higher education is not necessarily a requirement for exhibiting these important skills.

Rothstein (2002) argues that a high proportion of our youth do not need calculus and other high-science training, which is arguably true. However, the fact remains that our youth do and will require the ability think critically in a manner that they can assess the abundance of information in life and the workforce, as per Autor et al. (2003). It could be argued that our public elementary and secondary schools could vastly benefit our citizens by preparing them to think and assess rather than learn content-specific knowledge. Our current pedagogy, however, uses mathematics and science as the foundation for learning higher order thinking skills. Thus, while Rothstein is correct in an absolute way, he is misguided if he disregards the use of high math as a vehicle for developing important cognitive skills for the knowledge era. It seems that a liberal arts education would be the most important knowledge base for a thinking society, with mathematics and science as part of that liberal education.

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PART V. WHAT IT ALL MEANS

At the beginning of this discussion we posed three questions: What are the economic and non-economic returns to postsecondary education investments? Who reaps the benefits of those investments? And, most importantly, are there sufficient returns, both economic and non-economic, to the larger society to justify increasing public investment in higher education? The answers found in the literature are neither simple nor complete, but they offer some generally consistent points to highlight and some possible conclusions to consider.

We have established that there are returns to postsecondary education (with an unequivocal “yes” at the individual level), although the benefits may be overstated when relying on simple descriptive statistics citing income and quality of life measures, and a maybe, at best, at the societal level. Individuals with postsecondary degrees make more money and appreciate all the privileges that go along with that in US society. Society, for its part, also benefits from these college graduates society through tax revenue, decreased spending, and arguably greater productivity. Whether other goods in society, such as increased participation in civic life and reduced incarceration rates, can be directly attributed to educational attainment levels is open for debate, but data do show that people with more education vote more and go to prison less. Much more research is needed about the non-economic benefits of investing in postsecondary education.

The questions from Part II are still unanswered: Is a society better off if all the individuals in that society have an equal opportunity to reap the economic and social benefits of education but do not? Are there generally enjoyed externalities to having a largely highly educated population? Or does the competition to gain more education diminish the value of lower levels of education and skew the overall benefits?

Questions about who benefits are very important in the United States because of a beleaguered past in race relations and class struggle. Postsecondary education benefits those who are in a position to take advantage of it, and a disproportionate number of people of color and low-income people are in no position to take advantage of postsecondary opportunities. The elementary and secondary educational systems in the US are not preparing these young people appropriately to take the next step. As Rothstein (2002) suggests, we position public schools for inevitable failure: “Persistent failure, in turn, leads to withdrawal of political support for public schools and makes it all the less likely that they can fulfill this impossible mission” (p. 1).

Although the labor market does reward postsecondary degrees, there is no empirical evidence saying that postsecondary degrees are indicators of higher skill levels. There is evidence that specific credentialing programs provide proof of certain skills, but there is insufficient evidence to say that the knowledge economy requires higher levels of education. This lack of proof opens the door to discussions about what skills are needed and whether some of them can be gained in fully publicly-supported programs like secondary schools. It also opens the door to discussions about measuring

Postsecondary education benefits those who are in a position to take advantage of it, and a disproportionate number of people of color and low-income people, regardless of color, are in no position to take advantage of postsecondary opportunities.

what college graduates know and are able to do when they are awarded bachelor's degrees in any given field. Discussions in this area support plans that suggest fine tuning the connections, perhaps at a regional level, between training programs and industry.

The final question about whether there should be increased public investment in postsecondary education is the most challenging because if there are benefits to be had in getting more education, a plural and open society wants to make sure that everyone can reap those benefits. But there may be more to determining the costs associated with changing or maintaining the number of people getting postsecondary degrees than simply "spreading the wealth." The shift in the US economy that appears to make postsecondary degrees more valuable, according to some, is also making high school diplomas less valuable. In actuality, the enlarging gap has less to do with the valuation of postsecondary degrees as it is with the continued devaluation of the high school diploma (Rothstein 2002; Autor, Levy et al. 2003). In fact, Census data show that the value of a BA is holding with inflation, and only professional degrees are showing large increases in earnings over time (Gladieux and Swail 1998). Regardless, we are still watching the economic gap between high school diploma holders and college degree holders widen at a significant rate. The cost can then be described as either making those without college degrees poorer or increasing the number degree holders and making postsecondary degrees less valuable, unless, of course, it is true that the degree holders create their own demand.

Considering all the research reviewed in this report, the main question of whether more is better requires a mixed response. While we can talk about private and public returns to education, we can say little about the impact or necessity of increasing the college-going and college-graduating population. Currently, 75 percent of high school graduates go on to some form of postsecondary education. On the aggregate, how much more can we really expect to push toward postsecondary education, and how much should we push students to go to four-year institutions? Is this a question of access, persistence, or quality? Perhaps all three.

The pressure to expand higher education in order to remain globally competitive based on a belief in the connection between the two requires some serious thought. Policymakers are very concerned that the US is losing its competitive edge and are now asking what the education system—secondary and postsecondary—can do to keep us on top of the economic pile.⁷ Although there is little evidence of the positive impact of increasing the number of college graduates, one wonders if we can afford not to expand higher education, or at least improve the quality and excellence of our higher education system. Given the huge inroads that India, Russia, China, and other industrialized nations have shown and their exponential growth in the number of college graduates—especially in engineering and technology areas—are we comfortable enough to sustain the status quo? Even though the US has the highest percentage of

⁷ In June 2004, the Senate Finance Committee held a hearing on the outsourcing of US jobs and how higher education should be reconfigured to correct that problem. The Educational Policy Institute testified at that hearing.

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youth attending and completing college and professional degrees than any industrial nation, the *supernations*—India and China—are able to place millions of students even with a small matriculation rate.

At what cost are we willing to gamble? We cannot necessarily provide evidence to support postsecondary expansion, but we may not be able to deny that it exists. We could potentially end up in an education version of a nuclear arms race. Perhaps, without diminishing the valuable contribution of UK scholars debating the economic growth benefits, a larger challenge to US thought on the issue is this country's history of racial and class struggle.

Given there is much we do not know about the impact of expanding higher education, and the fact that we have limited resources to expand higher education, we are offered only a few choices with regard to prudent public policy. At the top of the list is the acceptance that postsecondary opportunity starts in our nation's 10,000-plus public and private school districts. We need to increase our commitment to public elementary and secondary education such that all students graduate with a set of skills that allow them the most flexibility for their education and career choices. The greatest disservice we do to students is to track them into inflexible career options by limited the type and quality of education they receive. Students from low-income backgrounds, of color, and with disability are severely handicapped, so to speak, in their ability to navigate the school system and receive an equitable education that prepares them fully for a life of work and enjoyment.

Second, if we truly want to expand educational opportunity, the greatest impact, from an economic standpoint, is to focus on those students who have the greatest opportunity to benefit. This suggests targeting first-generation, low-income students, because an education will provide them with the tools to lift themselves up from one social stratum to another. In turn, these individuals will pay more taxes, rely less on public subsidies, become more informed consumers and citizens, and break the cycle of poverty that plagues urban and rural communities alike.

If policymakers do not buy the economic argument of targeted postsecondary expansion to those who do not have such access, perhaps the argument is better staged as being the "right thing to do." Our society is built on the belief that everyone has a chance to better themselves and their families, even though that has become even more difficult to do in light of a widening gap between the haves and have-nots. Thus, policymakers can make a prudent choice to provide hope and opportunity to all by expanding carefully targeting public programs and services to those who can really use them. Society will clearly benefit from this tactic.

All things considered, perhaps we should find guidance in Howard Bowen's (1977) conclusion that the monetary returns from higher education are sufficient to offset all of the costs, and that the non-monetary returns, measured in social stability and efforts toward equality, are much greater in value: "In short, the cumulative evidence leaves no doubt that American higher education is well worth what it costs" (p. 448).

The greatest disservice we do to students is to track them into inflexible career options by limited the type and quality of education they receive.

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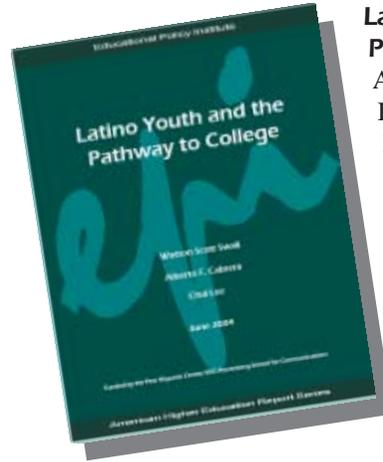


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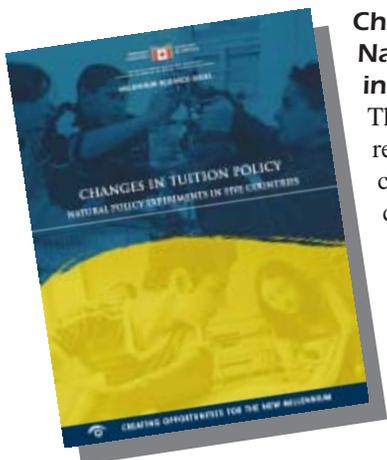
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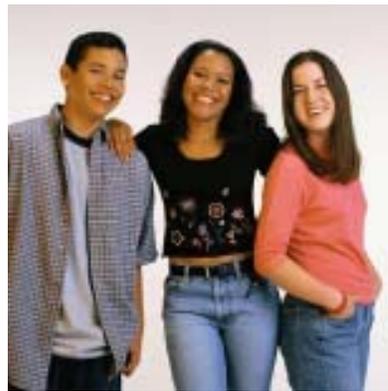


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