

FISCAL AND ECONOMIC EFFECTS OF COLLEGE ATTAINMENT\*

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## FISCAL AND ECONOMIC EFFECTS OF COLLEGE ATTAINMENT

### 1. INTRODUCTION

Opportunity Maine is putting forth a citizen's initiative that seeks to "create educational opportunity and higher-paying jobs throughout Maine" ([www.opportunitymaine.com](http://www.opportunitymaine.com)). Its legislation, An Act to Allow a Tax Credit for College Loan Repayments, would provide "a tax credit to reimburse educational loan payments for any Maine resident who earns an associate or a bachelor's degree in Maine, and lives, works and pays taxes in Maine after earning that degree." In essence, this legislation will reduce college tuition for those remaining in Maine after graduation. By lowering the cost of higher education and providing an incentive to remain in the state after college, the Opportunity Maine initiative is intended to increase the proportion of Maine residents with a college degree.

This report examines the fiscal (i.e., tax revenues and government spending) effects of college attainment, as well as the importance of an educated workforce to business and economic development. However, it should be noted upfront that we do not provide a direct assessment of the Opportunity Maine proposal. The information presented below was compiled and analyzed in a variety of contexts for purposes other than this initiative. With this caveat in mind, we hope that this report contributes to the debate about Opportunity Maine and the likely consequences of a more educated workforce and citizenry in Maine.

### 2. COLLEGE PAYS

On average, earnings rise significantly with educational attainment. This is true nationally, and in Maine (and in the rest of the world). Data from the 2002-2005 Current Population Survey indicate that among Americans between the ages of 25 and 64, the average weekly earnings of those with associate's degrees are 35 percent higher than for high school graduates with no college. The average earnings for those with bachelor's degrees (without advanced degrees) are 98 percent (i.e., almost double) the average earnings of high school graduates. In Maine, holders of associate's degrees earn 39 percent more than high school graduates, and holders of bachelor's degrees earn 63 percent more than high school graduates. Contrary to some popular opinion, college education pays for Maine students.

College education also pays for states as a whole. Consider the following facts in the years 2002 through 2005. The proportion of Maine's working-age population with at least a bachelor's degree was 8 percent below the national average, and 23 percent below the New England average. Maine ranked thirtieth among the fifty states (and last in New England) in attainment of bachelor's degrees. Maine's per capita income was 10 percent below the national average and 25 percent lower than the average in New England. Maine ranked thirty-fourth among the fifty states (and last in New England) in per capita income.

Given the remarkable similarity between Maine's relative numbers for college attainment and per capita income, it is tempting to conclude that the lack of higher education is *the* reason for lagging prosperity in the state. Although this single explanation oversimplifies a complex issue, there is little doubt that the relative lack of higher education in Maine is a substantial factor in holding back the state's prosperity growth. The Maine State Planning Office (2001) contends that the "[p]ercent of adults with at least a four-year college education is perhaps the most important variable in explaining the variation in per capita incomes among states. By itself, it accounts for 51 percent of the differences among the fifty states." It is becoming increasingly clear to policy professionals that the development of a higher-skilled workforce is one of the most important issues, if not the most important issue, for prosperity growth in this state (and in every other state).

### 3. COLLEGE ATTAINMENT AND TAX REVENUES

Among Americans between the ages of 25 and 64 in 2002 through 2005, average annual personal income of those with a bachelor's degree (and no higher degree) was \$26,925 higher than the average income of those with only a high school diploma. Combining data from the U.S. Census Bureau and the Bureau of Economic Analysis indicates that average state and local taxes as a percentage of personal income was 10.5 percent during fiscal years 2001 through 2004. Thus, the average additional state and local tax revenues per bachelor's degree are \$2,833 annually.

The total difference in state and local tax revenues from a bachelor's degree over, say, a 45-year working lifetime is \$127,482. Moreover, this is a somewhat conservative calculation because it ignores the fact that state and local taxes are slightly progressive, and it does not include tax revenues after retirement (sales and property taxes still apply during retirement).

In Maine, average annual personal income of those with a bachelor's degree (and no higher degree) was \$16,245 higher than the average income of those with only a high school diploma. Average state and local taxes as a percentage of personal income was 13 percent. Thus, the average additional state and local tax revenues per bachelor's degree are \$2,112 annually. The total difference in state and local tax revenues from a bachelor's degree over a 45-year working lifetime is \$95,035. Again, this is a somewhat conservative calculation.

### 4. COLLEGE ATTAINMENT AND GOVERNMENT SPENDING

In addition to higher tax revenues, an increase in college attainment provides other fiscal benefits such as reduced expenditures on unemployment compensation, welfare, Medicaid, and incarceration costs.

### *Unemployment Compensation*

Among Americans between the ages of 25 and 64 in the early 2000s, the average unemployment rate for those with a bachelor's degree (and no higher degree) was 3.1 percent, compared to 6.0 percent for those with only a high school diploma (and the difference has been even larger in Maine). The fiscal savings in state unemployment compensation is \$46 per year per bachelor's degree (and even larger in Maine). This adds up to \$2,087 over a 45-year work horizon.

### *Welfare*

American high school graduates were 5.5 times more likely than college graduates to receive some type of public assistance or welfare in the form of cash. Among those with a high school diploma but no college, 1.1 percent received some form of cash assistance. Among holders of bachelor's degrees, the ratio was 0.2 percent. The average amount of cash assistance was 6.0 times higher for high school graduates than for college graduates. The fiscal savings in terms of public cash assistance is \$31 annually per bachelor's degree (and considerably larger in Maine).

In addition, American high school graduates were 2.9 times more likely to receive child-care assistance than college graduates (0.44 percent versus 0.15 percent), and 4.3 times as likely to receive transportation assistance (0.31 percent versus 0.07 percent).

### *Medicaid*

Medicaid is an expensive program (about two-thirds of the costs are covered by the federal government) that has grown rapidly in recent years; thus a college differential can translate into big bucks. Indeed, the largest fiscal impact of college attainment, other than the projected increase in tax revenues, appears to be Medicaid-related savings.

High school graduates were 3.7 times more likely than college graduates to be covered by Medicaid: 7.8 percent of high school graduates were covered by Medicaid, compared to 2.1 percent of four-year college graduates. The average annual cash value of Medicaid among high school graduates was \$624, 4.1 times higher than the \$154 for college graduates. The average annual Medicaid savings is about \$470 per bachelor's degree (and considerably more in Maine). This adds up to \$21,177 over 45 years.

### *Worker's Compensation*

Fiscal savings from college attainment are also created through worker's compensation programs. In some states, however, worker's compensation is an off-budget item. That is, some states operate worker's compensation through private insurance companies dealing directly with employers. The effect, however, is the same whether on- or off-budget.

High school graduates were 2.65 times more likely to receive worker's compensation than college graduates (1.28 percent versus 0.48 percent). The average American high school diploma holder received \$69 more per year in worker's compensation than the average bachelor's degree holder (and the difference is even larger in Maine).

### *Incarceration Costs*

Combining data from the U.S. Census Bureau and the Bureau of Justice Statistics indicates that average state and local government correctional expenditure per inmate was \$31,571 during fiscal years 2001 through 2004. A 2003 report from the Bureau of Justice Statistics indicates that 0.098 percent of the adult population with a bachelor's degree or higher is incarcerated in state and local prisons. For those with a high school diploma, the proportion is 1.11 percent, 11.3 times higher than the proportion for college graduates. Thus, the college differential in incarceration costs is \$358 annually. Maine has particularly high incarceration costs per prisoner, thus the differential is considerably larger in this state.

## 5. EDUCATIONAL ATTAINMENT AND ECONOMIC DEVELOPMENT

Policy researchers have long recognized the importance of educational attainment to regional economic development. As opposed to "cost minimization" approaches to economic development that attempt to attract businesses through cheap labor and low taxes, "human capital" approaches seek to spur development through a high-skilled labor force. The logic behind human capital theories of economic development is that education enhances innovation and productivity, which in turns leads to higher wages. Also, a highly educated workforce is essential in attracting and creating high-tech businesses and jobs.

Richard Florida's ideas about the creative economy, which have been embraced by policymakers in Maine and elsewhere, are grounded in human capital theory. Although education itself does not always lead to an increase in creativity, knowledge and information – which are gained through education – "are the tools and materials of creativity" (Florida 2002, p. 44). In a review of Florida's book, Edward Glaeser points out the similarity between Florida's ideas and human capital theories, "While Florida acts as if there is a difference between the human capital theory of city growth and the "creative capital" theory of city growth, this is news to me. I have always argued that human capital predicts urban success because 'high skilled people in high skilled industries may come up with new ideas'" (Glaeser 2004).

The "social return" to college attainment is a key indicator of the importance of education to regional economic development. Whereas the "private return" to college attainment (discussed above) reflects the earnings differential between those with and without a college degree, the social return is represented by the relationship between average per-capita income and the proportion of residents who have completed college. The social return to education captures the higher private earnings associated with a degree, as well

as potential spillover effects in which interaction among workers (both with and without a college degree) may lead to higher wages.

Using a large sample from the 2000 U.S. Census, statistical analysis of U.S. counties shows that the proportion of residents aged 25 and older with a college degree has a positive and statistically significant effect on earnings per worker. A one-percentage point increase in the proportion of county residents with a college degree leads to an increase in per-worker earnings ranging from \$78.20 to \$86.11.

Another indication of the strong connection between college attainment and regional economic development is the high importance that businesses place on an educated workforce as a determinant of location and growth. Workforce issues, including the availability of educated workers, are commonly near the top of the wish list in business surveys related to firm location.

For example, a 2001 survey conducted by the Maine Development Foundation indicated that 42 percent of Maine businesses listed “educated workforce” as the most important issue for long-run economic growth in the state. This choice was well ahead of all of the other five choices (efficient government, infrastructure, etc.) An additional 28 percent of the sample businesses listed educated workforce as the second most important item.

Recent surveys found that workforce issues are relevant to Maine businesses in two key sectors. Sixty-four percent of Maine businesses that responded to an environmental and energy technology sector survey conducted in 2006 indicated that the availability of qualified employees has an impact on their profitability or growth potential. Other business climate factors cited as relevant to a large proportion of survey respondents included health care costs (79 percent), public perception of the industry (74 percent), state environmental regulations (70 percent), and municipal personal property taxes (67 percent).

Eighty-one percent of Maine businesses that responded to a biotechnology industry survey conducted in 2003 stated that the availability of qualified biotechnology employees has an impact on their profitability or growth potential. Other factors that biotechnology businesses felt were relevant to their operations included worker’s compensation costs (92 percent), utility costs (89 percent), access to university-based research information (82 percent), and state sales and income taxes (74 percent). In terms of the proportions of businesses that felt a given business climate factor impacted their operations, the availability of qualified employees generally fell between “business cost” issues such as health care and utility costs, and above “location issues” such as the quality of local schools (K-12) and local infrastructure and public services.

## 6. FINAL THOUGHTS

The information presented in this report discusses, in general terms, the fiscal gains associated with an educated workforce and citizenry. College attainment increases

earnings, which leads to higher taxes, and results in a reduction in government spending on programs and services such as unemployment compensation, welfare, Medicaid, and incarceration costs.

Educational attainment and regional economic development are interconnected in a variety of ways. As noted above, the proportion of a region's workforce with a college degree has a strong positive effect on per capita earnings. Enhancing wages and a region's standard of living are common goals of many economic development strategies. In addition, a highly educated workforce is cited frequently by businesses as a key location and growth factor. Thus, a human capital approach to economic development may be able to achieve the goals of enhanced business activity and growth.

The ultimate success of a policy initiative, such as the legislation proposed by Opportunity Maine, at achieving the benefits discussed in this report will depend on its ability to increase the proportion of Maine residents who have a college degree. Ideas like those put forth by Opportunity Maine that seek to lower the cost of higher education should be considered alongside other efforts aimed at making Maine an attractive locale for college graduates.

## 6. BIBLIOGRAPHY

Allen, Thomas G. and Todd M. Gabe, "The Business Climate for Biotechnology in Maine." Maine Agricultural and Forest Experiment Station, University of Maine, Miscellaneous Report 432, December 2003.

Blair, John. 1995. *Local Economic Development: Analysis and Practice*. Thousand Oaks, CA: Sage Publications.

Florida, Richard. 2002. *The Rise of the Creative Class*. New York: Basic Books.

Gabe, Todd, Kristen Colby and Kathleen Bell. 2007. "Creative Occupations, Earnings and the U.S. Rural-Urban Wage Gap." Unpublished manuscript.

Glaeser, Edward. 2004. Review of Richard Florida's *The Rise of the Creative Class*. [Online, retrieved May 23, 2005, available: [http://post.economics.harvard.edu/faculty/glaeser/papers/Review\\_Florida.pdf](http://post.economics.harvard.edu/faculty/glaeser/papers/Review_Florida.pdf)]

Maine State Planning Office. 2001. "30 and 1000: How to Build a Knowledge-based Economy in Maine and Raise Incomes to the National Average by 2010."

Noblet, Caroline and Todd Gabe. "Business Climate for Maine's Environmental and Energy Technology Sector." Department of Resource Economics and Policy, University of Maine, Staff Paper 565, November 2006.

Reilly, Catherine and Philip Trostel. "Matchmaking in the Labor Market." *Maine Sunday Telegram*, September 5, 2004.

Trostel, Philip. 2002. "Economic Prosperity in Maine: Held Back by the Lack of Higher Education." *Maine Policy Review*.

Trostel, Philip and Catherine Reilly. "Which Comes First – the Workers or the Work?" *Kennebec Journal* and *Central Maine Morning Sentinel*, December 17, 2004.

Trostel, Philip. 2006. "Does Public Investment in Higher Education Pay for States?" *National Social Science Journal*.

Trostel, Philip. 2006. "Fiscal Benefits from Public Investment in Higher Education." Unpublished manuscript.

Trostel, Philip. "Wacky Priorities: Corrections versus College" *Bangor Daily News*, November 18, 2006.