Center for the Future of Arizona

IDEAS AT WORK

Bridging the Grad Gap:

Measuring the Economic Benefits of Educational Attainment in Arizona.

Preethy E. George, M.A.
Research Assistant

Mary K. Hamman, M.H.R.L.R.
Research Assistant

Benah J. Parker, Ph. D.
Director, Education Policy and Research

541 East Van Buren, Suite B-5, Phoenix, Arizona 85004
Phone: 602-496-1360 www.arizonafuture.org

September 2007

Executive Summary

It is well understood and accepted that high school dropouts are at a substantial lifelong economic disadvantage compared to high school graduates. This analysis goes further in demonstrating that while obtaining a high school diploma offers important economic advantages to high school graduates over dropouts, the real value of a high school degree is that it can be leveraged in the pursuit of post-secondary educational opportunities.

The difference between the earning potential of a high school dropout vs. a high school graduate is not as great as between a "high school only" graduate and a high school graduate with at least some post-secondary education. Not surprisingly, the largest economic gap exists between high school dropouts and graduates who earn a bachelor's degree. However, findings suggest taking some college courses or obtaining an occupational certificate of completion or a two-year associate degree can make a striking difference in the quality of life of the individual and his or her family.

These results indicate that the true value of a high school diploma is the access it provides to various types of occupational training and higher education options. By pursing any of these opportunities, individuals can enjoy much greater financial security throughout their lifetime, higher standards of living, and even reduce the financial burden of being a high school dropout on their family and society. In short, students need to be encouraged to not only graduate from high school but to go on and pursue post-secondary educational opportunities.

Bridging the Grad Gap

Measuring the Economic Benefits of Educational Attainment in Arizona

Students who drop out of high school face significant economic disadvantages compared to their peers who graduate. Arizona dropouts were nearly three times more likely than graduates to be unemployed (United States Census, 2003). When employed, the average high school dropout earned only 50% of the average graduate's wage. The financial disadvantages of dropping out of school are experienced not only by the individual who drops out, but also by their families and the larger society as well. In order to develop appropriate policies to deal with this problem, it is important to assess the size of this disadvantage

The differences between the socioeconomic outcomes of high school graduates and high school dropouts or "Arizona Grad Gaps," are the central focus of this paper.[1] Grad Gaps represent the difference between the economic outcomes of Arizona high school dropouts and high school graduates as well as between high school dropouts and high school graduates who have varying levels of post-secondary education. The following sections present estimates of Arizona Grad Gaps as well as discuss the costs that dropouts confer on families, communities and the Arizona economy. The final section will provide a discussion of public policy implications of the research findings.

How Do We Define Dropout Rates?

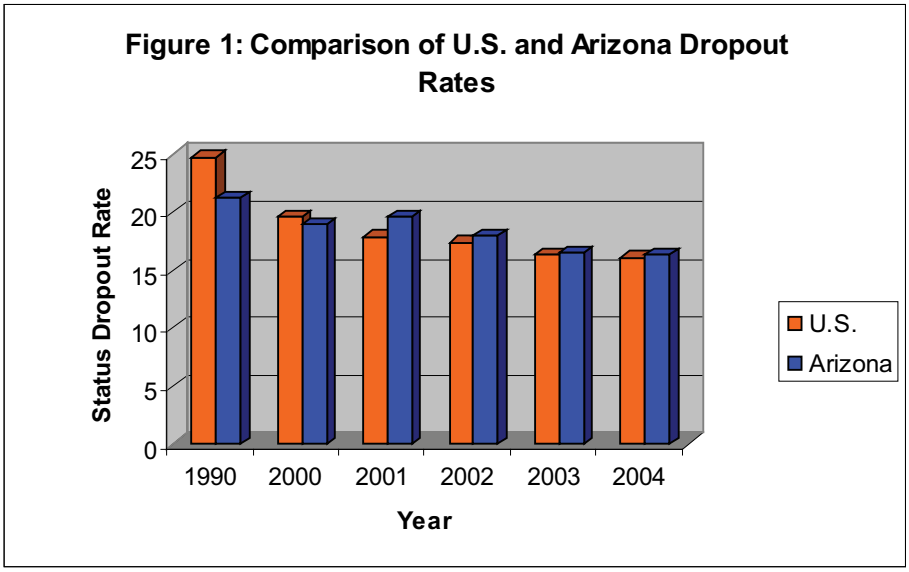
There has been reasonable discussion at both the state and national level about how best to measure the number of dropouts in the U.S. One method is the *status rate*, which takes a section of the population, such as those aged 25 to 34, and calculates the proportion of those individuals within that population who do not have a high school diploma or equivalent.

The status rate allows us to compare segments of the labor force across regions. This method is particularly relevant in migratory areas like Arizona, because status graduation rates allow us to count dropouts who may have failed to complete high school in another state or country before they moved to Arizona. Arizonans must confront the social and economic consequences of the resident high school dropout population whether those individuals dropped out of an Arizona high school or if they come from elsewhere. Because the aim of this paper is to estimate the individual and social costs of failing to complete high school, a status rate will be used to measure the number of high school dropouts in Arizona.

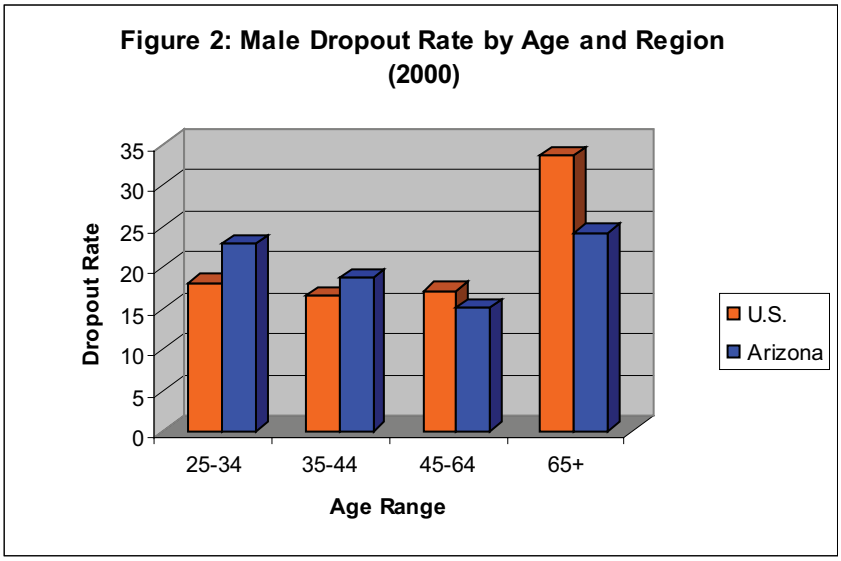
[1] For a more comprehensive discussion of the research findings and further details about the data analytic techniques used in the Grad Gap paper, please refer to Bridging the Grad Gap: Measuring the Economic Benefits of Educational Attainment in Arizona by Mary K. Hamman. Copies are available by request from the Center for the Future of Arizona: http://www.arizonafuture.org

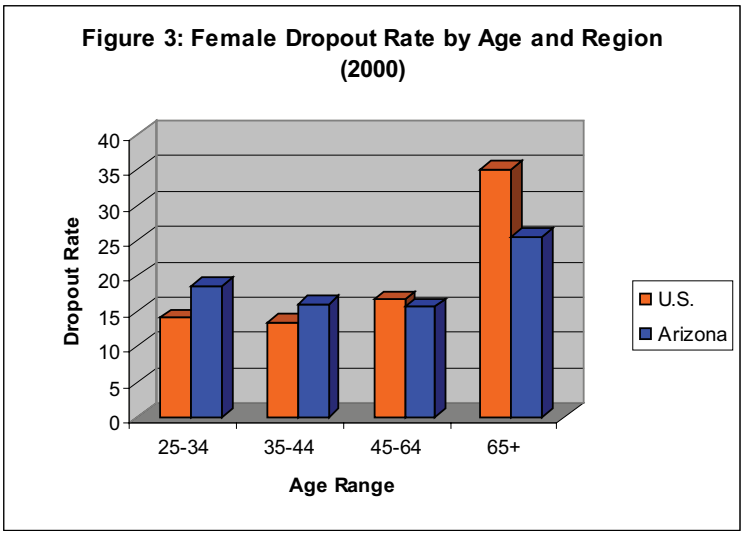
Where Does Arizona Stand?

In 2000, according to Decennial Census data, 19% of Arizona's population age 25 and older did not have a high school degree. Figure 1 displays the average status dropout rate in 1990, and 2000 through 2004 for the state as a whole, alongside the total status dropout rate in the U.S.



In general, the trend suggests that dropout rates in the U.S. and in Arizona have declined from 2001 to 2004. However, when we break the data down by gender and age, a disturbing pattern emerges, as indicated in Figures 2 and 3. As we can see, individuals age 65 and older are the group with the highest dropout rate in both the U.S. and Arizona. *However*, among both men and women, Arizona has a higher concentration of dropouts in the *younger* end of the age distribution than there are in the U.S as a whole.





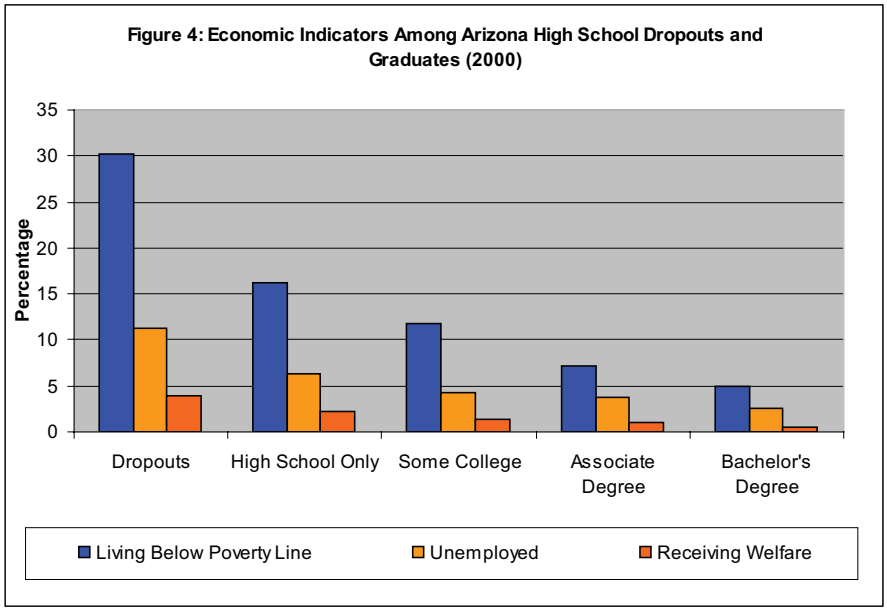
The last observation is cause for concern. The individual and social costs imposed by young Arizonans who choose to drop out today are likely to be higher than the costs incurred and imposed by dropouts who are now nearing retirement. In today's knowledge-driven economy, educational attainment is one measure of skill, and regions with a more highly educated workforce are likely to be much more economically competitive than are those that have a skill shortage.

Economic Outcomes for Dropouts and Graduates in Arizona

One way to quantify the cost of dropping out is to compare the economic outcomes of high school dropouts and graduates. In this paper, "Grad Gaps" capture these differences simply by taking a given economic outcome (e.g., per capita income) and measuring the difference (or gap) between dropouts and graduates with different levels of educational attainment. For example, let us compare the incomes of employed dropouts and employed Arizona graduates. "Employed Arizona graduates" include those who are "high school only" graduates, those with some college, those with an associate degree or occupational certificate, and those with a bachelor's degree[2]. This comparison reveals a striking gap in the income earned by dropouts and graduates. The average per capita income of all employed Arizona graduates (ages 18 – 65) in 2000 was $37,624.92 as compared to $18,485.94 for Arizona dropouts—a Grad Gap of $19,138.98. This means that employed Arizona graduates earned more than twice as much as dropouts who are employed.

Figure 4 displays how all dropouts and graduates compare on other measures of economic outcomes, such as the percent of individuals living in poverty, the unemployment rate and the percent of individuals on welfare (Census, 2000)[3].

[2] Data for individuals with an educational level beyond bachelor's degrees are not included in these analyses.
[3] Data presented in this paper are from the 2000 Decennial Census, which includes only the income voluntarily reported to the U.S. Census by respondents.



Looking across all economic indicators in Figure 4, dropouts are far worse off than individuals who graduate. Dropouts are almost *twice* as likely as "high school only" graduates to be living in poverty and are more likely than those who have graduated to be unemployed and receiving welfare.

The contrast between dropouts and graduates becomes even more striking when we compare their outcomes to those of individuals who have pursued further educational opportunities.

Table 1: ARIZONA GRAD GAP INCOME COMPARISON
Employed High School Dropouts and Graduates Ages 18-65 (2000)

EDUCATIONAL ATTAINMENT LEVEL	PER CAPITA MEAN INCOME	INCREASE OVER DROPOUT PER CAPITA INCOME (GRAD GAP)	INCREASE OVER PREVIOUS EDUCATIONAL LEVEL
Dropouts	$18,486	Not applicable	Not applicable
High School Only Grads	$26,317	$7,831 +42%	$7,831 +42%
Grads with Some College	$31,469	$12,983 +70%	$5,152 +20%
Grads with Associate Degree/ Occupational Certificate	$35,083	**$16,597 +90%**	$3,614 +11%
Grads with Bachelor's Degree	$49,990	$31,504 +170%	$14,907 +43%
Average for All Employed Grads	$37,625	$19,139 +104%	Not applicable

NOTE: Percentages are rounded.

As shown in Table 1, the Grad Gap is largest between dropouts and graduates with bachelor's degrees ($31,504), and thus there is more of an opportunity to earn more income with a four-year degree rather than a two-year degree. However, acquiring some postsecondary education can still make a substantial difference in individuals' economic outcomes. For example, as shown in bold in Table 1, individuals who have earned an associate degree or occupational certification earn approximately $16,597 more than a dropout annually, which is nearly twice the wages of dropouts when employed.

Other indicators of economic outcomes, such as employment rates, also indicate that having some postsecondary education can be an important asset. Table 2 presents the proportion of individuals in Arizona who are employed and the Grad Gaps for employment rates by their level of educational attainment.

Table 2: ARIZONA GRAD GAP EMPLOYMENT COMPARISON
Employment Rates for High School Dropouts and Graduates Ages 18-65 (2000)

EDUCATIONAL ATTAINMENT LEVEL	EMPLOYMENT RATE	INCREASE IN EMPLOYMENT RATE OVER DROPOUT EMPLOYMENT RATE (GRAD GAP)	INCREASE IN EMPLOYMENT RATE OVER THE PRIOR EDUCATIONAL LEVEL
Dropouts	49.5%	Not applicable	Not applicable
High School Only Grads	63.3%	+13.9	+13.9
Grads with Some College	71.2%	+21.8	**+7.9**
Grads with Associate Degree/Occupational Certificate	75.0%	+25.6	+3.8
Grads with Bachelor's Degree	79.3%	+29.8	+4.3

NOTE: Percentages are rounded.

Clearly, employment rates improve as more education is completed. However, after individuals graduate from high school, the Grad Gap really opens up when we compare dropouts to graduates who have completed some college. In fact, as indicated in bold in Table 2, the greatest gains after graduating from high school occur when graduates complete some college.

Similarly, some educational attainment beyond high school can also make a difference in the lives of those who are living in poverty. Table 3 indicates the proportion of Arizonans who are living in poverty based on their educational attainment.

Table 3: ARIZONA GRAD GAP POVERTY COMPARISON
Poverty Rates for Employed High School Dropouts and Graduates Ages 18-65
(2000)

EDUCATIONAL ATTAINMENT LEVEL	PROPORTION OF INDIVIDUALS BELOW POVERTY LINE	DECREASE IN POVERTY RATE FROM DROPOUT POVERTY RATE (GRAD GAP)	DECREASE IN POVERTY RATE FROM PRIOR EDUCATIONAL LEVEL
Dropouts	18.4%	Not applicable	Not applicable
High School Only Grads	8.6%	- 9.8	- 9.8
Grads with Some College	6.6%	- 11.8	**- 2.0**
Grads with Associate Degree/Occupational Certificate	4.0%	- 14.4	- 2.6
Grads with Bachelor's Degree	2.9%	- 15.5	- 1.1

NOTE: Percentages are rounded.

Table 3 illustrates that the percent of individuals living below the poverty line decreases with more educational attainment. In addition, after individuals graduate from high school, the largest change in poverty Grad Gaps occurs when they complete some college or earn an associate degree or occupational certificate, as noted in bold. These findings indicate that two-year associate degrees or occupational certifications make an important difference for those living on the margin of economic distress.

Dropouts and Their Families

Children of high school dropouts often experience the consequences of their parents' educational decisions. In 2004, 17% of married couple families in households headed by high school dropouts in Arizona were living below the poverty line as compared to 8.6% of families headed by high school graduates (Census, 2004). Additionally, high school dropouts and their dependents have a higher probability of being uninsured, which is not surprising considering insurance is tied to employment for many Americans (DeLeire, et al., 2005). Economists, sociologists, and psychologists have found strong evidence for a link between parent and child educational attainment. Some studies have estimated similar effects between older and younger siblings and neighborhood peers, which suggests that children of dropouts tend to perpetuate the cycle of economic hardship within their families and communities (Case & Katz, 1991; Ginther, et al. 2000; Rumberger, 1983). Indeed, the adverse effects seem to cascade through generations.

Dropouts and Their Communities

High school dropouts impose high costs on society on top of the personal costs that they and their families experience. Nationwide, during the average month in 1999, dropouts age 18 and over were more than twice as likely as high school graduates to participate in a major means-tested public assistance program such as Aid to Families with Dependent Children (AFDC), Temporary Assistance for Needy Families (TANF), General Assistance, Food Stamps, Supplemental Security Income, Medicaid or Housing Assistance (Lester & Tin, 2004).

Cohen (1998) estimated the cost of a high school dropout to society to be between $243,000 and $388,000 in 1997 dollars. Translated to 2007 dollars, this cost is currently estimated to be between $311,130 and $496,785 for a single high school dropout. Between 20% and 50% of this figure can be attributed to factors other than lost earnings potential. This estimate rises to between $2.2 to $3.0 million if the dropout is also a career criminal and drug user. Finally, regions with high proportions of high school dropouts may have trouble creating high quality jobs and sustaining economic growth. Thus, areas with a higher proportion of dropouts in the workforce may be less attractive to relocating or expanding businesses with high value-added production needs.

Economic research has long suggested that highly educated regions tend to grow more rapidly and experience higher standards of living, (Acemoglu & Angrist, 2000; Eaton & Eckstein, 1997; Glaeser, et al., 2001; Glaeser, et al. 1995; Jacobs, 1970; Moretti, 2004; Rauch, 1993). As our economy transitions from production of goods to production of ideas, areas that lack a well-educated workforce may find themselves at a strong disadvantage. Given that Arizona has a comparatively high concentration of high school dropouts in its working age population relative to the national average, these concerns are especially pertinent for the Arizona economy.

Policy Implications

On average, Arizona high school dropouts have lower per capita incomes, are more likely to live below the poverty line, experience higher unemployment rates, and are more likely to receive welfare income than high school graduates. After reviewing all of the Grad Gaps, it may be tempting to conclude that simply converting an individual dropout to a high school graduate would improve his or her economic well-being. However, this conclusion would be limited and short-sighted.

What the data clearly show is that while there is a definite advantage enjoyed by high school graduates over high school dropouts, the meaningful gains accrue at the post-secondary level.

While the percentage increase in earnings between a high school dropout and a high school graduate is higher (42%) than that between a high school graduate and an individual with an associate degree or occupational certificate (33%) the actual dollar difference is in fact greater ($7,831 vs. $8,766). The most compelling argument for graduating from high school and pursuing post-secondary education is found in Table 1, where the gains for some college, associate degree or occupational certificate, and bachelor's degree over high school dropouts are $12,983, $16,597, and $31,504 respectively, compared to the $7,831 advantage of a high school graduate over a high school dropout.

Thus, while earning a high school diploma has advantages in terms of earnings potential over dropping out of high school, the conclusion to be drawn is that the real advantage of a high school diploma is that it can be leveraged towards further educational pursuits. Ultimately, there is more is to be gained across the board on all measures by an individual's pursuing at least one or two years of college, earning an occupational certificate or associate degree, or earning a bachelor's degree, than the benefit gained by simply earning a high school diploma. Clearly, the greatest gains to an individual come from completing a bachelor's degree, with the next best outcome in terms of earnings if employed coming from completing an associate degree or an occupational certificate. Even this level of post-secondary education can nearly double earnings relative to those earned by a high school dropout. Furthermore, a high school dropout has an expected employment rate of only 49.5% compared to the 75.0% rate of an individual with an occupational certificate or associate degree. Even a year or two of post-secondary education can make a big difference as shown in Tables 1 and 2.

A close look at the data also suggests a need to increase the rigor and requirements for earning a high school diploma. At present, the minimal requirements for earning a high school diploma in Arizona do not qualify the student for entry into one of Arizona's three universities. For example, the minimal high school graduation requirements call for only two years of math while entry into one of the three universities requires four years of math. Given the difference in socioeconomic outcomes between various levels of educational attainment, it behooves us to give our students the benefit of a more rigorous high school education in order to maximize their choices of educational pathways following their graduation from high school. In other words, simply getting the student to walk across the stage to collect a high school diploma – as worthy a goal as this may be – is not enough to maximize that student's choices and improve their quality of life nor reduce the potential costs to society of their failing to meet their maximum potential as individuals. A potential dropout must be encouraged not only to graduate from high school but must also continue his or her education beyond high school in order to leverage the economic benefits of a high school diploma.

Many community college and university students must take remedial (i.e., below college level) courses their first year in order to prepare themselves for post-secondary education. This indicates inadequate preparation in high school and a lack of alignment between high schools and the requirements of post-secondary institutions. This problem is widely recognized by policymakers, educators, and the business community in Arizona and is being addressed through various means, including Governor Napolitano's P-20 Council. This paper provides support for those efforts, showing that not only should there be better alignment between high school and post-secondary institutions, but that students need to be encouraged to continue their education through to the post-secondary level of the educational pipeline.

Conclusions

Arizonans who drop out of high school are at a substantial lifelong economic disadvantage. To bridge the Grad Gap and enjoy higher standards of living, potential dropouts and "high school only" graduates must continue their education beyond high school. The findings in this paper show the true value of a high school diploma is in the ability to leverage it toward additional career training or higher education. As beneficial and desirable as a high school diploma may be to an individual, we need to find ways to smooth the transition between high school and post-secondary education and encourage students to continue their education beyond high school. Our Grad Gap analysis reveals that the most striking improvement in economic outcomes occur when high school students graduate from high school and go on to earn an occupational certificate, an associate degree, or a bachelor's degree.

This also means that a high school diploma must represent a skill set that meets or exceeds minimum requirements for entrance into institutions of higher education. For many Arizona high school graduates today, this is not the case. In addition, an Arizona high school diploma should provide the recipient with the tools he or she will need to become a lifelong learner.

To improve graduation rates *and* improve individual and social outcomes for each new generation of Arizona's workforce, prospective dropouts must not only walk across the stage to receive their high school diploma but also continue to walk through the doors of technical training institutions and higher education institutions and on to successful employment in the future.

References

Acemoglu, D. & Angrist, J. (2000). How large are human capital externalities? Evidence from compulsory schooling laws. *NBER Macroeconomics Annual*.

Case, A.C. & Katz, L. F. (1991). The company you keep: The effects of family and neighborhood on disadvantaged youths. *NBER Working Papers*,1-41.

Cohen, M.A. (1998). The monetary value of saving a high-risk youth. *Journal of Quantitative Criminology*, 14, 5-33.

DeLeire, T., Levine, J. & Levey, H. (2005). Is welfare reform responsible for low-skilled women's declining health insurance coverage in the 1990's? *Economic Research Initiative on the Uninsured*. Ann Arbor 1-45.

Eaton, J. & Eckstein, Z. (1997). Cities and growth: Theory and evidence from France and Japan. *Regional Science and Urban Economics*, 27, 443-474.

Ginther, D., Haveman, R. & Wolfe, B. (2000). Neighborhood attributes as determinants of children's outcomes: How robust are the relationships? *The Journal of Human Resources*, 35, 603-642.

Glaeser, E.L., Kolko, J. & Saiz, A. (2001). Consumer city. *Journal of Economic Geography*, 1, 27-50.

Glaeser, E.L., Scheinkman, J. A., & Shleifer A. (1995). Economic growth in a cross section of cities. *Journal of Monetary Economics*, 36, 117-143.

Jacobs, J. (1970) *The Economy of Cities*. New York, Vintage Books.

Lester, G.H. & Tin J. (2004). Dynamics of economic well-being: Program participation 1996 to 1999. Who gets assistance? *Current Population Reports: Household Economic Studies* U.S. Department of Commerce: Economic and Statistics Administration: U.S. Census Bureau: 1-28.

Moretti, E. (2004). Workers' education, spillovers and productivity: Evidence from plant-level production functions. *American Economic Review*, 94, 3.

Rauch, J.E. (1993). Productivity gains from geographic concentration of human capital: Evidence from the cities. *Journal of Urban Economics*, 34.

Rumberger, R.W. (1983). Dropping out of high school: The influence of race, sex and family background. *American Educational Research Journal*, 20, 199-220.

United States Census (2000, 2003, 2004). Retrieved on August 8, 2007 from http://www.census.gov/census2000/states/az.html

Acknowledgements

The authors would like to thank Dr. Lattie Coor, Dr. Sybil Francis, Rebecca Heller, and the staff at the Center for the Future of Arizona for helpful comments on earlier drafts of this paper. We would also like to thank Dr. Dennis Hoffman and Dr. Arthur Blakemore for their keynote address "The Economics of Dropouts: The Complexities of Uncovering the Real Costs" at the 2003 Southwest Conference on Enhancing School Completion, which was the impetus for this work.

About the Authors

Preethy E. George, M.A., is a research assistant at the Center for the Future of Arizona and is currently working towards her Ph.D. in Clinical Psychology from Arizona State University. Preethy's research interests focus on public policy as it relates to youth and families, mental health, and ethnically diverse communities.

Mary K. Hamman, M.H.R.L.R., is a research assistant at the Center for the Future of Arizona and a doctoral candidate in Human Resources and Industrial Relations at Michigan State University. She is a labor economist and her research examines relationships between workplace policies and practices, women's employment and childbearing decisions, and child health.

Benah J. Parker, Ph.D., is the Director of Education Policy and Research at the Center for the Future of Arizona. She graduated from Arizona State University with a Ph.D. in Social Psychology and was a graduate research assistant at the Center for the Future of Arizona while completing her dissertation.

The Center for the Future of Arizona

The Center is a 501 (c)(3) non-profit organization funded through the donations of philanthropic individuals and organizations dedicated to Arizona's future well-being. Dr. Sybil Francis serves as the organization's executive director, and Dr. Lattie Coor serves as chairman and CEO. In addition, the Center is governed by a board of directors comprised of distinguished community leaders committed to improving the lives of Arizonans. For more information, visit the Center's Web site at www.ArizonaFuture.org or call (602) 496-1360.