

**THE CRITICAL ROLE OF
ENHANCED EDUCATIONAL INVESTMENT AND OUTCOMES
ON THE ECONOMIC DEVELOPMENT OF FLORIDA:
THE SOCIAL RETURN ON INVESTMENT (ROI)
OF INCREASED PUBLIC FUNDING OF HIGHER EDUCATION**



Prepared for:



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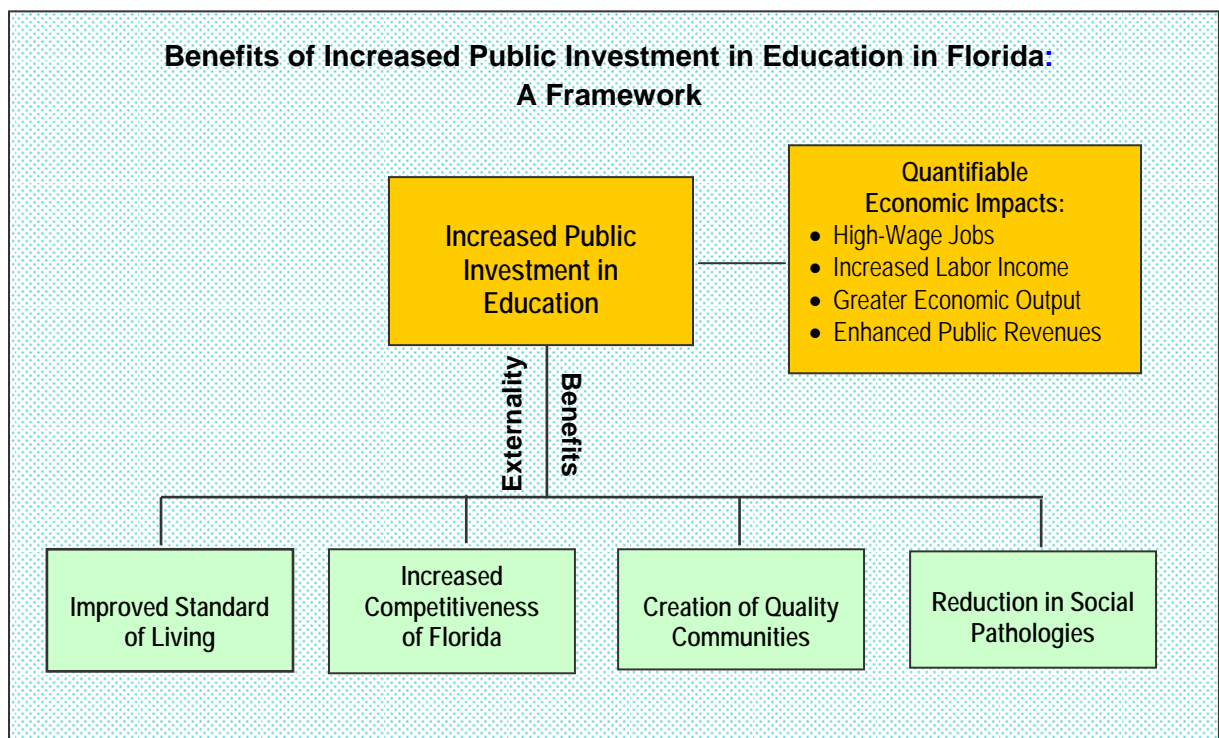
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I. EXECUTIVE SUMMARY

- ❑ Human resource development is the “currency” for increasing the standard of living of Florida in the globally competitive 21st Century.
- ❑ Educational outcomes have improved steadily in Florida since the start of the new Century. However, the State still ranks below the nation and key competitor states in key outcomes, especially those related to minority population achievement and funding effort.
- ❑ The benefits of continued improvement in educational outcomes and funding effort are illustrated in the framework below. This framework serves as the basis for this study, with particular reference to quantifying the Social Return on Investment (ROI) of an increased funding effort of higher education by the State.



- ❑ Utilizing professionally accepted methodologies, the study estimated that a \$1 billion increase in public funding for higher education yields a Social ROI of 220 percent. These are the quantifiable economic impacts described above such as increased high-wage employment, labor earnings, fiscal revenues and economic output.

□ In addition to quantifiable economic impacts of educational effort, the externality benefits to society as a whole, of enhanced investment in public education, are also significant and analyzed in the study. Among these externality benefits are the following:

- Florida is competing globally to attract, retain and expand high-wage and high-value added industries. According to site selectors, industries place the availability of talent as the number one factor in their decision to invest in a given location. Therefore, improving educational outcomes in Florida is critical to the State’s economic development strategy.
- According to Enterprise Florida – the State’s official economic development organization:

“Skilled, educated talent is the key to productivity improvements, higher wages, innovation and increased prosperity. As a result, a commitment to education is a fundamental requirement to capture a share of the value-added growth of tomorrow.”¹

- The study also demonstrates that improved educational outcomes, especially among Florida’s fast-growing and diverse minority population, would increase the quality of life of our communities, reduce social pathologies and improve the standard of living of Floridians.

¹ 2007-2012 Strategic Plan for Economic Development.

II. BACKGROUND

A. *ENLACE Florida: Mission and Work*



ENLACE (Engaging Latino, African-American, and other Communities for Education) Florida is a multiyear national initiative launched with a \$1.4 million grant from the W. K. Kellogg Foundation to strengthen the educational pipeline and increase opportunities for Latinos, African-Americans and other under-represented students in Florida. ENLACE Florida was formed in 2006 by USF (University of South Florida), FAU (Florida Atlantic University), FIU (Florida International University) and UCF (University of Central Florida), which are currently part of a network of constituent groups that include universities, colleges, schools, districts, community organizations, students and parents.

The mission of ENLACE Florida is to promote college readiness, access and success for under-represented students to enter and complete college. By engaging communities of all under-represented students, ENLACE Florida continues to develop a powerful network whose ultimate goal will translate into policy changes at all levels, an enhanced well-being for Floridians and increased educational outcomes for under-served student groups, employment opportunities, labor income and health, as well as reduction in crime rates².

In 2007, ENLACE Florida received a state appropriation to promote Readiness and Access for Underrepresented Groups (RAUG). By 2014 Hispanic and black students will account for 50 percent of Florida's high school graduates and 4 out of 5 new jobs will require some form of postsecondary education over the next decade. To develop effective policies to ensure that more students will be prepared to enter and succeed in college, ENLACE Florida contracted with a number of educational experts in Florida and throughout the country to analyze critical issues and recommend policy changes. This report, commissioned by ENLACE Florida as part of the RAUG initiative, provides a critical point of departure for understanding the value of state investments in public education.

² Source: www.enlaceflorida.org.

The ENLACE Florida network advocates for policy changes that will increase educational opportunities for under-represented students. School dropouts have both private (individual) and public and social (collective) costs, such as less contribution to society, lower wages and salaries, higher rates of unemployment, and lower rates of labor force participation. On the other hand, lower rates of incarceration, better health, lower social service expenditures and use of public assistance programs are some of the public benefits from attaining higher levels of education. Additional benefits include increases in employment, productivity, income, tax revenues and economic growth. The lack of appropriate investment in public education is costlier.

B. The Shifting Demographic Profile of the US and Florida: Growth of Minorities

In the early 1970s, the US non-minority (white) population accounted for 84 percent of the total, while blacks and Hispanics represented 11 percent and 4.5 percent, respectively. Although US population diversification began to unfold in the 1960s, it accelerated during the 1980s and 1990s. Demographic growth in the 1990s was mainly characterized by 60 percent immigration growth, including births to immigrant women.

In the mid 2000s, the share of non-Hispanic whites in total population has dropped to 66.4 percent, while **Hispanics have become the largest minority segment in the US and are growing rapidly** (Table 1 next page). The share of Hispanics in the total US population grew

from 4.5 percent in the 1970s to 9 percent in the 1990s and currently accounting for 14.8 percent of the total population³. The share of blacks in the US population remained almost constant, growing from 11.1 percent in the 1970s to 12.8 percent in the mid-2000s. It is estimated that by 2030, 36 percent of the US will be Hispanic or black. Moreover, the Hispanic population is projected to almost double by 2030 in the US⁴.



³ US Bureau of the Census (1970, 2007).

⁴ US Bureau of the Census (2008).

Table 1. US Minority and Total Population (Thousands)

	Estimates 2006	Projections				
		2010	2020	2030	2040	2050
Total	299,398	310,233	341,387	373,504	405,655	439,010
Black	38,323	39,909	44,389	48,728	52,868	56,944
Percent Share Blacks/Total	12.8	12.9	13.0	13.0	13.0	13.0
Hispanic	44,311	49,726	66,365	85,931	108,223	132,792
Percent Share Hispanics/Total	14.8	16.0	19.4	23.0	26.7	30.2
Percent Share Minorities/Total	27.6	28.9	32.4	36.1	39.7	43.2

Source: Population Division, US Census Bureau (2007, 2008).



In 2005, minorities accounted for 33.8 percent of the school-age population in the US (18.4 percent of Hispanics and 15.4 percent blacks). Black and Hispanic youths are more likely than non-minorities to drop out of school, as explained later in Section IV. Moreover, the dropout rate for Hispanics doubled that of blacks (31 percent vs. 15 percent) early in this decade while US non-minorities have a dropout rate of only 8 percent. The large size of school-age minority dropouts will become a societal liability without the necessary educational investments and educational innovations to be made by the US and State public and private sectors.

Florida's total population is projected to grow 58.6 percent by 2030 and will have gained 1.3 million people of Hispanic-origin by 2025 (Table 2). It is projected to become the third most populous State in the Union within a decade. Hispanic-origin descendants represent the largest minority group in the State (20.1 percent) and the group that has had the largest rate of growth among minorities: 86.3 percent between 1995 and 2006. Hispanic-origin population is projected to grow at a rate of 35.7 percent in the next two decades. Blacks currently account for 15.4 percent of the total population in Florida, having had a rate of growth of 33.7 percent between 1995 and 2006. Such dynamics have contributed to a large school-age population cohort that is made up disproportionately of Hispanics and blacks, and will have implications for changes in Florida's labor force, its productivity and its global competitiveness.

Table 2. Florida Current and Projected Population		
	Population	Projected Population Growth Rate
Florida Population (2006) ¹	18,089,889	58.6%
Florida Projected Population (2030) ²	28,685,769	
Black Population (2006) ¹	2,778,549	27.9%
Projected Black Population (2025) ³	3,556,000	
Hispanic-Origin Population (2006) ¹	3,642,989	35.7%
Projected Hispanic-Origin Population (2025) ³	4,944,000	
Sources: US Census, ¹ 2006 American Community Survey, ² Population Division, Interim State Population Projections, 2005. ³ Population Projections for States, by Age, Sex, Race and Hispanic-Origin: 1995-2025.		

The social and economic benefits derived from the growth of minority groups in the labor force will greatly depend on the investment and efficiency of Florida’s educational system. This is especially true since Hispanics have, on average, lower levels of education than the other two groups (blacks and non-Hispanic whites). The children of immigrants will greatly contribute to the growth of the labor force in the next 20 years. It is estimated that net growth in the domestic workforce will primarily involve foreign-born workers⁵.

C. The Role of Improvement in Educational Outcomes for Florida’s Economic Development

Historically, Florida has been one of the six states to host the majority of the foreign-born population along with California, New York, New Jersey, Illinois and Texas. Florida’s high school completion rate improved moderately early in this decade; however, among high school graduates, just over half pursue a college education, placing Florida in the 33rd rank nationwide as compared to other states. Even though the State’s educational investment and outcomes have improved, they are not at levels that allow most Florida residents to increase their future standard of living, especially as the State faces a highly competitive global economy based on talent creation.

Florida’s annual graduation rate for year 2006-2007 (grades 9-12) is higher for whites (80 percent) than for minorities: the high school graduation rate of black students is 56 percent and of Hispanics 63 percent.

⁵ Migration Policy Institute (2007).

Within the age cohort 25 years and over, 84.5 percent have completed high school in Florida (the State ranks 32 in the nation), close to the 84.1 percent national average. However, the State ranks below the national average of those who have completed a Bachelor's degree⁶ (Florida ranks 29 in the nation). **These outcomes are not sufficient to create the talent required for a 21st Century "Knowledge-Based Economy."**

There is a close correlation between education attainment and productivity. In the 10 most productive states, 33 percent of the core workforce has a college degree⁷. Based on current population estimates, the Florida Board of Governors estimated that if the State were to attain the national average level of education by 2027, Florida would need 3.5 million adults with Bachelor or higher degrees, which represents over a million more than the State currently has. To attain the level of the most productive states, the number would have to increase by half a million more to reach an estimated total of 4 million graduates. This seems an unlikely goal unless educational funding and improved system efficiencies are attained, and a major effort to educate the diverse population is implemented.

Furthermore, the State's education system faces significant budget cuts through at least FY 2009-2010. In essence, current and future budget cutbacks make this goal much more difficult to achieve.



The State University System currently awards two-thirds of all Bachelor degrees in the State, while community colleges award, at present, a smaller percentage. The Florida Board of Governors suggests a set of strategies that should be pursued simultaneously: improve the K-12 pipeline, especially

to raise the success of under-represented minorities, expand the State University System and community colleges to produce more Baccalaureates, and create world-class programs that attract out-of-state and foreign students who pay most or all of the cost of their education⁸. **However, the current and impending budget cuts have the potential to further the gap with the top states in improving the standard of living through enhanced educational funding and efficiency improvements.**

⁶ US Census Bureau (2006). 2006 American Community Survey.

⁷ Board of the Governors (2007).

⁸ Ibid.

Education and workforce development are the critical foundations of economic development in the 21st Century. Talent is the top economic development issue for a knowledge-based, innovation-driven economy, which requires significant investment, effort and coordination among local business communities, public and private universities and economic development interests.⁹

The State of Florida's 2007-2012 Strategic Plan for Economic Development recognizes the challenge of the 21st Century, and aims at creating a knowledge-driven economy by attracting, retaining and expanding high value-added, high-wage industry clusters in such fields as life sciences, simulation industries, emerging environmental technologies, aerospace and others. **The development of a streamlined and talent-building higher education sector is a key objective of Florida's Statewide Strategic Plan.**

An important element to maintain and expand the productivity of the State's workforce is the supply of highly skilled, multi-talented and creative workers. Valuable career, education and employment choices will deepen the skill base of Florida's workforce and labor productivity growth, and will significantly contribute to the State's economic growth. Florida has a diverse economy with a variety of industry clusters, which are magnets for a skilled workforce seeking business and career opportunities, aiming at becoming a hub for commerce that brings significant employment and growth opportunities to the regional economy.



This dynamic global marketplace is dedicated to attracting and maintaining value-added industries, spurring private-sector investment and growth throughout all aspects of the economy. Spanning from life sciences, simulation industries, aerospace and emerging environmental technologies, the economy has also grown and diversified into other sectors such as tourism and entertainment industries in South Florida, where Miami-Dade is known as the Gateway to the Americas for its international trade and long-standing business sectors. As innovation becomes increasingly important in today's dynamic 21st Century economy, the need for well-trained, highly skilled professionals is at an all time premium.

“The development, attraction and retention of talent at all levels has emerged as the leading economic development priority”¹⁰.

⁹ Enterprise Florida, Inc.

¹⁰ Enterprise Florida Inc. (EFI). Road Map to Florida's Future - 2008 Review.

These diverse sources of employment translate into a multitude of job opportunities for graduates, making higher education a key element of regional economic development. The Florida State University System and its graduate education supports the 21st Century labor force by providing a growing supply of talent to the expanding industries of Florida. Building and improving the education and skills of Florida’s working-professional population is a top priority of both the State and the private sector. Thus, higher education and the expansion of the State University System is a primary asset of the economic development strategy of Florida.

Improving educational outcomes in the preK-20 education system, especially for minorities as the fastest growing population cohort, is critical to develop the foundations for a knowledge-driven economy that will steadily increase the standard of living of Floridians. Florida has made moderate improvements in its educational outcomes since the Statewide Plan for Economic Development was developed in 2004, but much needs to be accomplished and the current under-investment in the educational system threatens prior progress.¹¹



The creation of world-class talent is a key factor to increasing the levels of innovation and productivity of the State’s labor force. Under the Governor’s leadership, Florida invested significantly in the innovation economy by creating a world-class life sciences cluster. Thus, the need to support this and other growing innovation clusters becomes a priority as Florida stands significantly below national and global standards in achieving “world-class” status in educational outcomes as well as workforce

development. (See Table 3 below.)

	<i>Ranking Relative to US States n=50 States</i>
Current investment (\$) per student in public K-12 schools	42
Average salaries (\$) of public school teachers	32
State/local revenues for public schools (K-12) per \$1,000 in personal income	49
State/government expenditures for K-20 (higher education included) per \$1,000 of Personal Income	50
Per capita state and local government expenditures for K-12 public schools	46
Per capita state and local government expenditures for Higher Education	50
Source: National Education Association, Statistical Data Set. Figures are primarily for 2000-2004.	

¹¹ Florida Chamber of Commerce, Enterprise Florida, Inc.

III. THE ECONOMIC DEVELOPMENT IMPORTANCE TO FLORIDA OF PUBLIC INVESTMENT IN EDUCATION: CONCEPTUAL FRAMEWORK

A. *Improved Educational Outcomes Are Critical to Florida's Economic Development*

Enhanced human resource development would give Florida a competitive advantage over its global competitors. Educational attainment is also one of the most important determinants of a person's income, full participation in the labor market, employment, health status, quality of life and housing. High school graduation is considered as the **very minimum** adequate standard of education to enter into the labor market and to succeed as an adult, opening up a range of opportunities associated with the possibility of engaging in further training and college education in an increasingly competitive global economy.

Enrollment and completion of a college education result in further economic benefits, such as increases in the productivity of the future labor force. However, poor and inadequate education leads to large social and public costs such as lower income and economic growth, higher costs of public services in the form of health care, public assistance and criminal justice and reduced tax revenues. This study shows that the benefits from public investments to improve educational outcomes after high school graduation for minority groups in Florida are substantial and considerably exceed public investment costs. Further savings in public assistance costs, health and other public programs may be gained from higher educational attainment, thereby reducing budget constraints. These conclusions, based on economic research, are valid at both State and national levels.

B. *The Importance of Investment in Education for Minorities and other Under-served Residents of Florida*

Florida, as a large immigrant-receiving State with a growing minority population, has the most to gain from narrowing college enrollment and graduation gaps vis-à-vis whites and in terms of future labor force productivity and wage gains. The policy challenge is to narrow achievement gaps for low-income youths over the next two decades by increasing targeted industries in education, especially during the early childhood years and at the K-20 level. This would promote not only economic development and social mobility, but it would also ensure taking advantage of the demographic dividend before fertility declines reduce the size of future cohorts and the age of the working population stabilizes. However, cuts to Florida's educational budget through at least FY 2009-2010 have the potential to compromise positive educational outcomes especially since the FY 2009-2010 budget will likely suffer from

significant reductions when adjusted for inflation. Figure 1 below shows the approved education budget for FY 2008-2009 demonstrating its severe decrease from previous years.

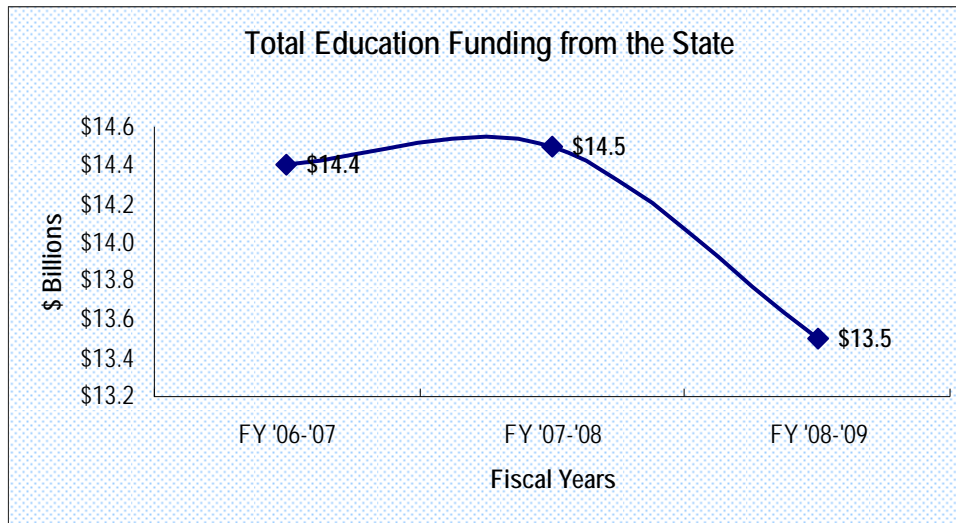


Figure 1
Sources: Fl. Department of Education, Fl. Community College System and Board of Governors, Final Amendment Packages.

Amendment 5 (even though overturned by the Supreme Court due to lack of language specificity, a similar version **could surface** in the Legislature during the 2009 Legislative session) was envisioned to be a revenue-neutral tax swap and subject to the approval of Florida voters in 2008, and would have replaced the required local effort (RLE) school property tax set by the Legislature for education funding with a combination of sources that relies mostly on increased sales taxes. Florida Tax Watch (2008) considers it likely that the Legislature will have to raise taxes in excess of the property tax cut rather than resulting in a revenue-neutral tax swap. Using a REMI model to simulate the policy change, The Washington Economics Group, Inc. (WEG) estimates a negative net effect from netting out the positive impact of the RLE and the negative impact from the sales tax increase.

Amendment 5 would have also subjected the public school system of Florida to the volatile sales tax as a primary revenue source and could have decreased public funding for education over time.

While State budget cuts are likely through 2010, the indicators in the following Tables suggest the need to continue improving the funding and efficiency of Florida's educational system (Tables 4-6 on the next page).

Table 4. Florida Educational Investment Effort (Expenditures)		
	National Average Percentage	National Ranking (out of 50 states)
Per Pupil K-12 School, 2004-2005	82 percent	40
Per Capita K-12 School, 2004	75 percent	48
Percent Change Per Pupil K-12, 1995-2004 (CPI adjusted)	36 percent	48
Source: The Florida Education Association, Education State Rankings 2006-2007. Morgan Quitno Press.		

Table 5. Measures	
Outcome Measures*	State Fiscal Effort Measures**
<ul style="list-style-type: none"> Public high school graduation rate is among 5 lowest in the nation 44th ranking among U.S. states in production of new Baccalaureate degrees 34th ranking among U.S. states in the production of advanced degrees 	<ul style="list-style-type: none"> 42nd ranking among U.S. states in current public investment per student in public K-12 schools 32nd ranking among U.S. states in average salaries of public school teachers 46th and 50th ranking among U.S. states in per capita state and local expenditure for K-12 and higher education respectively
Sources: Florida Department of Education, The Florida Education Association.	

Table 6. Public High School Graduation Standings	
Top Five States in Public High School Graduation	Bottom Five States in Public High School Graduation
New Jersey	Nevada
North Dakota	South Carolina
Nebraska	Georgia
Minnesota	Florida
Utah	New York
Source: Overview of State-by-State Data, Making Opportunity Affordable, 2007.	

IV. ECONOMIC IMPACTS AND HIGH COSTS FROM UNDER-INVESTMENT IN EDUCATION FOR UNDER-SERVED STUDENTS IN FLORIDA

Recent research studies indicate that a lack of major educational improvements among the children of minorities, immigrants and low-income families will lead to a less skilled future labor force relative to the present one. This is a very serious societal and economic development challenge for Florida. As previously mentioned, the US, and to some extent Florida, is currently having a school-age population cohort bulge, largely the result of high fertility rates among immigrant families with relatively lower incomes and little education¹². If the educational inequalities persist, the US will fail to be able to sustain productivity growth and compete effectively in global markets where countries like India and China are making significant strides.

A. Social and Economic Disadvantages for a Large Number of Minorities Start Before Conception

Large percentages of high school dropouts originate in disadvantaged families and impoverished communities. Social and economic disadvantages, which include living amid such conditions, contribute to children's failure, with significant impacts on society. Inequality of opportunity begins after conception, or even before if the mother does not receive early medical attention during pregnancy. Minority population mothers are likely to receive less prenatal care during the first trimester of pregnancy relative to other population segments. Moreover, the number of newborns who do not survive within their first year drops depending on whether their minority mothers are high school dropouts, graduated from high school, but received no further education, or have at least one year of college.

Differences in socially and economically disadvantaged families also stand out in children's birth weight and mother's breast-feeding in the early postpartum period and within the child's first year of age. These conditions not only place minority children at risk, but also predict special education placement, lower academic achievement, and the likelihood of social pathologies later in life. Inequalities in the probability of lifetime success are further noticeable as we consider other indicators that consistently show disadvantages for black and Hispanic children relative to white children under 18: inequalities in and lack of health insurance coverage, inaccessibility of primary care physicians that leads to a lower likelihood of primary and preventive medical care, inadequate nutrition that negatively affects cognitive ability, oral health and disparities in vision, that further add to educational inadequacy¹³.

¹² C. Belfield & H. Levin (Eds.), *The Price We Pay: Economic and Social Consequences of Inadequate Education*. Washington, DC: Brookings Institution Press (2007).

¹³ Ibid.

Other factors that likely affect school readiness and educational attainment include insufficient practices to develop hand-eye coordination, becoming familiar with books and words, hours spent in kindergartens and non-classroom hours, and behavioral characteristics that will predict mathematics and reading success in school (attention span and interpersonal skills, among others). Social and economic disadvantages are also reflected within an environment where minority groups and low-income families prevail and challenge success. Achievement outcomes and differences are noticeable starting in the 4th grade, and inequalities persist as minority children move through school, including opportunities for sports, out-of-school activities, diet and physical activity, sexual behavior and substance abuse¹⁴.

B. A Lost Way to Upward Mobility, the Labor Market and Potential Earnings



In Florida, the share of high school completers of Hispanic-origin is 21.1 percent and that for non-Hispanic blacks is 21.2 percent. About as many Hispanic and non-Hispanic black females complete high school, while relatively more Hispanic males

complete high school compared to non-Hispanic black males. The shares of diplomas awarded are slightly below the shares of completers: 20.2 and 19.8 percent for Hispanics and non-Hispanic blacks, respectively. Table 7 below and Figures 2 and 3 on the next page provide the statistical information on this topic.

	<i>Total</i>	<i>Hispanic Origin</i>	<i>Black Non-Hispanic</i>	<i>White Non-Hispanic</i>	<i>Other</i>
High School Completers*	153,446	32,445	32,486	81,183	7,332
percent out of total completers	100%	21.1%	21.2%	52.9%	4.8%
Females	79,420	17,089	17,656	40,908	3,767
Males	74,026	15,356	14,830	40,275	3,565
High School Diplomas Awarded	143,746	29,067	28,411	79,326	6,942
percent out of total completers	100%	20.2%	19.8%	55.2%	4.8%
Females	73,891	15,113	15,320	39,871	3,587
Males	69,855	13,954	13,091	39,455	3,355

Source: Florida Department of Education (<http://www.fldoe.org/eias/eiaspubs/default.asp>)
 Note: *High school completers: completers are those students receiving standard diplomas, special diplomas, certificates of completion, and special certificates of completion.

¹⁴ Ibid.

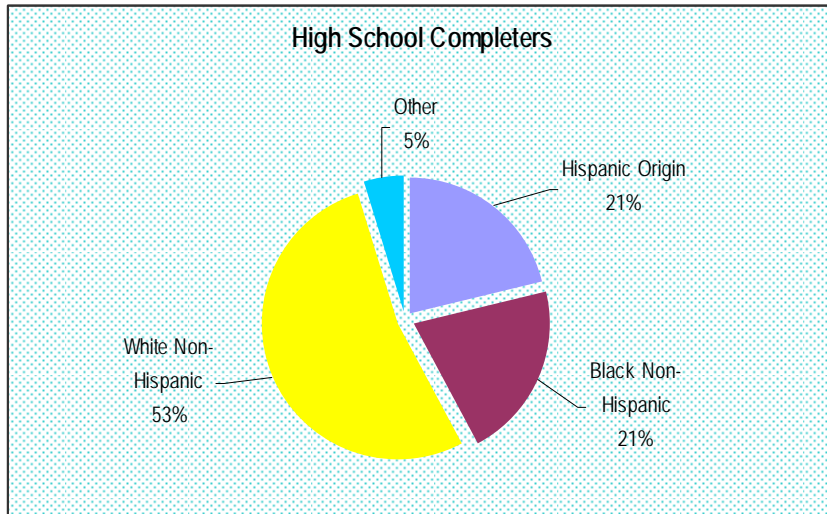


Figure 2
Source: Florida Department of Education.

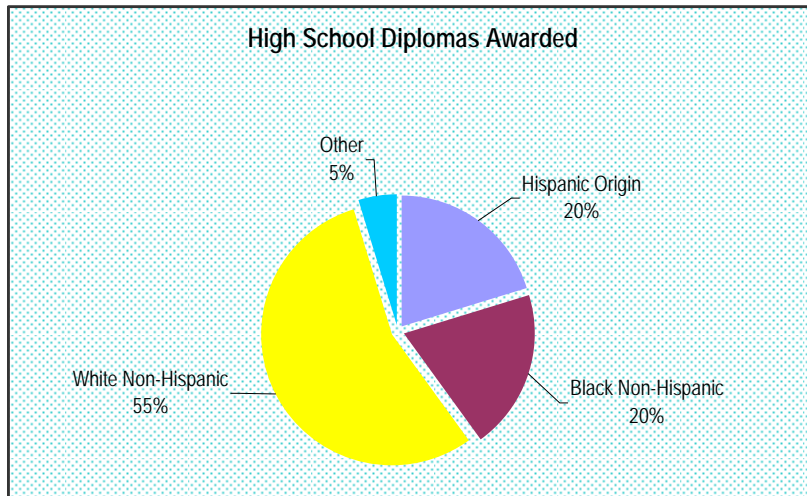


Figure 3
Source: Florida Department of Education.

Out of the total number of dropouts in Florida in the school year 2006-2007, 26.5 percent were black and 35.3 percent were Hispanic. Florida's total dropout rate¹⁵ was 3.5 percent in 2005-2006 and dropped to 3.3 percent in 2006-2007 (grades 9-12), while dropout rates were higher among blacks (4.7 percent) and Hispanics (3.9 percent).

¹⁵ Dropouts include all children in grades 9-12 who drop out of school for different reasons, including voluntary withdrawal. Source: Florida Department of Education, Florida Info Note (2007).

Going further into the educational achievement pyramid, it is also noticeable that significant progress continues to be needed. Florida lags behind most of the states in the production of new Baccalaureate degrees, Advanced degrees, and specifically the production of Science and Engineering Doctoral degrees.

Florida’s Educational Standing: Significant Progress Needed

- **44th** in states for production of new Baccalaureate degrees
- **34th** for Advanced degrees
- **40th** for production of Science and Engineering Doctoral degrees

Source: Enterprise Florida, Inc.

Education is the traditional way to upward mobility, providing skills that raise a person’s productivity and earnings potential. Thus, receiving inadequate education implies a social loss. In Florida, people who do not complete high school, work fewer weeks per year, are less likely to be employed, and their potential earnings average **below** at least 39 percent for males and 52 percent for females relative to those with high school diplomas but with no further education.

Therefore, minority families are again at an earnings disadvantage, due to inadequate educational outcomes, and those inequalities extend to future generations. As education is fundamental for productivity growth, **declines in productivity of the future labor force can also be expected**. Labor productivity of \$86,204 per employee in 2005 places the State in the 25th rank relative to other states. Median earnings of females are in all cases below those of males that have attained the same educational level. Males and females with a Bachelor’s degree earn, on average, 36 percent and 32 percent **more** than those who have some college education, and 68 percent and 71 percent **more** relative to those with high school education, respectively. Males and females with graduate education add, on average, 38 percent and 29 percent to their median income, respectively (Table 8).

	Total	Male	Female
<i>Population 25 Years and Over with Earnings</i>	<i>\$31,404</i>	<i>\$36,232</i>	<i>\$26,686</i>
Less than high school graduate	18,679	21,520	15,036
High school graduate (includes equivalency)	25,742	30,548	21,312
Some college or Associate's degree	32,123	37,799	27,695
Bachelor's degree	42,221	51,429	36,517
Graduate or professional degree	56,542	71,105	47,000

Source: US Census Bureau, 2007 American Community Survey (inflation-adjusted).

In relation to the labor market performance, Table 9 shows that the unemployment rate is much higher for Florida’s black men and women (7.2 percent and 5.1 percent respectively) than for Hispanics, 4.9 percent for men and 4.6 percent for women. The unemployment rates for non-minority men and women are below those for minorities. The unemployment rate for Floridians ages 16-19 years old is more than three times higher than the unemployment rate for men and women of any age. The employment ratio is higher for Hispanic men (75.5 percent) than for both black men (65.4 percent) and white non-Hispanic men (67.7 percent), while black women show a higher employment ratio (59.3 percent) than both Hispanic women (55.3 percent) and white non-Hispanic women (54.4 percent).

Table 9. Florida Employment Ratio and Unemployment Rate (2007)		
	Employment Ratio (out of population)	Unemployment Rate (out of Labor Force)
Men	67.5	4.3
Women	55.4	3.8
Ages 16-19	33.1	13.4
Black men	65.4	7.2
Black women	59.3	5.1
Hispanic men	75.5	4.9
Hispanic women	55.3	4.6
White men	67.7	3.8
White women	54.4	3.6
Source: Bureau of Labor Statistics (http://www.bls.gov/lau/ptable14full2007.pdf).		

C. Dropouts Are Likely to Face a High Risk of Illnesses and Diseases



The cost of providing public assistance increases for high school dropouts who likely depend on welfare assistance to meet basic needs. Attainment of higher levels of education is correlated with improved health. Dependence on public assistance decreases as more educated cohorts are usually covered by private health insurance. Individuals with more education typically live healthier and longer lives. High school graduates are expected to live 6 to 9 years longer and are less likely to get ill or disabled than their **drop out** peers. The public sector saves resources by successfully investing in education. Reductions in expenditures on Medicaid and potentially on Medicare and other public-sector program costs add to public savings.

Medicaid expenditures represent the largest and fastest-growing fiscal expense exerting pressure on the State's budget. Florida's health budget for FY 2008-2009 adds up to \$19 billion including \$16.2 billion for the Agency for Health Care Administration and \$2.9 billion for health care programs. As previously discussed, higher educational attainments create mechanisms that lead to improved health, namely through higher quality jobs and income, reduced exposure to crime and poor housing conditions, access to social networks and support that helps against depression and anger, and plausible reductions in the level of stress that further reduce the risk of illnesses and diseases (cardiovascular disease, cancer, diabetes mellitus and infectious diseases).¹⁶

D. High School Dropouts Heavily Rely on Public Assistance Programs

Achieving at least a high school degree is expected to lead to significant reductions in income-tested, safety-net programs such as cash, food and housing assistance. Underinvestment in education negatively affects such aid programs, although educational attainment does not preclude that people who complete high school may still need public assistance. **The literature is abundant on this topic and establishes that adults who do not complete high school are at an elevated risk of being on some form of public assistance.** This is particularly striking for less educated single mothers. Participation in cash programs and the Food Stamp Program has sharply declined since the mid-1990s in the US, but still, millions depend on these programs. In the beginning of the 2000s, over 8 million low-income households depended on the Food Stamp Program in the US, out of which single mothers headed over 2.5 million households. Housing assistance in the form of public housing, Section 8 vouchers and certificates benefit more than 2 million single mothers in the US¹⁷. These results are mirrored in Florida and most US states.

E. The Opportunity Cost of Lost Revenues for the Florida Government

Inequalities in education, health and level of income accumulate and compound over future generations. Florida's State University System faces increased tuition in public universities and budget cuts as discussed earlier¹⁸. The expected consequences include declines in enrollment in Florida's State University System in the short- and medium-runs, which limit access to higher education for students in Florida. Postponing college, studying out-of-state for those who may afford it, and giving up college education add to the cost of inadequate education.

¹⁶ Link & Phelan (1995), Muennig (2007).

¹⁷ Waldfogel, J., Garfinkel, I., and Kelly, B. (2007). Welfare and the Costs of Public Assistance.

¹⁸ Dosal, P. (2008). Higher Education in Florida on the Brink. ENLACE Florida.

The combination of lower State and local investments in public education in Florida, relative to the amounts required to compete effectively in the global marketplace, will further erode the long-term economic development potential of the State. According to the staff of Florida's Senate Finance and Tax Committee in a January 10, 2008 update on the State's fiscal finances¹⁹, State revenues are declining which will impact the educational system of the State.

- Total State revenues and total State taxes are registering an unprecedented two-year drop in FYs 2007 and 2008.
- In FY 2009 **estimated State taxes are still below actual receipts in FY 2006.**²⁰



¹⁹ Senate Finance and Tax Committee, Florida Economic and Revenue Update, January 10, 2008.

²⁰ This is in nominal terms. Adjusted for inflation the decline is even more pronounced.

V. THE POSITIVE ECONOMIC IMPACTS FLOWING FROM AN INCREASE OF \$1 BILLION IN STATE SUPPORT OF HIGHER EDUCATION

Increased expenditures associated with additional public support for higher education would generate economic impacts that extend beyond those **directly** related to the increased State expenditures. These “spillover” or multiplier impacts are the result of each business activity’s supply relationships with other firms operating within the region, the proportion of Gross Domestic Product (GDP)²¹ that accrues to households in the form of labor and capital income, and the propensity of households to spend income on goods produced within the local area.

A pro-forma increase of \$1 billion in State support for higher education discussed above constitutes the *direct* economic impact entered into the IMPLAN model for the State of Florida. Based on this *direct* impact, the IMPLAN model estimates the *direct* impacts for employment, labor income, public-sector fiscal revenues, and Florida Gross Domestic Product. The IMPLAN model also estimates *indirect* and *induced* economic impacts of the pro-forma increase in State support for all variables. These comprehensive *direct*, *indirect* and *induced* economic impacts are summarized in Table 10 below.

<i>Impact on:</i>	<i>Direct</i>	<i>Indirect & Induced</i>	<i>Total Impact</i>
Employment (Jobs)	16,025	8,247	24,272
Labor Income (\$ Mill.)	563	299	862
Florida Gross Domestic Product (GDP \$ Mill.)	575	567	1,142
Federal, State & Local Tax Revenues (\$ Mill.)	-----	-----	280
Total Economic Impact (\$ Mill.)	1,000	937	1,937

Source: The Washington Economics Group, Inc.

An estimated 24,272 permanent jobs for Florida residents could be created as a result of a \$1 billion increase in State support for higher education. The increase could be *directly* responsible for the creation of 16,025 permanent jobs in the Knowledge-Based Services and other sectors of the Florida economy. Thus, the increase positively impacts the State’s Economic Development Strategy.

²¹The GDP of an area represents the net economic value created through the local production of goods and services. This economic value is used to compensate workers, pay taxes, and provide a return to investors in these business activities.

The pro-forma increases in *indirect* and *induced* job creation process reaches deeply into all sectors of the Florida economy. This dramatically demonstrates the close supply inter-relationships that the Knowledge-Based Services sector has with all of the other sectors of the State’s economy. Specifically, 3,203 permanent jobs could be supported via these *indirect* economic effects (mostly suppliers). Lastly, 5,044 permanent jobs in all sectors of the local economy could be generated by *induced* consumer and business spending effects of increased educational investment. **Therefore, the total number of permanent jobs for Florida residents, directly, indirectly and induced, supported by the pro-forma education spending of \$1 billion is estimated at 24,272 – high wage jobs that could make a significant contribution to employment opportunities in Florida.**

The number of permanent jobs estimated by the IMPLAN model that could be created in each economic sector by the pro-forma education expenditures of an additional \$1 billion are summarized in Table 11 below. Of the 24,272 jobs that could be created, 89 percent are in the Knowledge-Based Services sector, 4 percent are in the Retail Trade sector, and the remaining 7 percent are distributed among other economic sectors.

<i>Industry</i>	<i>Jobs Supported</i>
Knowledge-Based Services	21,577
Retail Trade	1,058
Visitor Industry	703
Wholesale Trade & Transportation Services	539
Government & Other	188
Manufacturing	148
Construction	59
<i>Total All Industries</i>	<i>24,272</i>
Source: The Washington Economics Group, Inc.	

The pro-forma increase in State support for higher education could also have a significant impact on Labor Income for the State’s workers. Labor Income is the total value of compensation to all workers. In addition to the \$563 million of Labor Income *directly* created by the additional expenditures, \$113 million of Labor Income could be generated by increases in *indirect* economic activities, and \$186 million of Labor Income could be created by increases in *induced* economic activities.

In summary, this additional expenditure has the potential to generate over \$862 million in Labor Income for Florida residents, with the largest proportion of income in the Knowledge-Based Services sector as shown in Table 12.

Industry	Total Impact
Knowledge-Based Services	\$ 765,554
Retail Trade	30,495
Wholesale Trade & Transportation Services	28,402
Visitor Industry	15,438
Government & Other	11,220
Manufacturing	8,245
Construction	2,726
Total All Industries	\$862,080
Source: The Washington Economics Group, Inc.	

Florida’s Gross Domestic Product (GDP) created as a result of these additional expenditures is another measure of economic development benefits from the State’s support of higher education. The GDP of an area represents the net economic value created through the local production of goods and services. This net economic value is used to compensate workers, pay taxes, and provide a return to investors in the business activities. GDP is also the principal source of household income and a key measure of the contributions that the State’s support of higher education makes to the Florida economy. These added expenditures have the potential to create over \$575 million of Florida GDP *directly*, while \$221 million of Florida GDP could be generated as the result of *indirect* activities, and \$346 million of Florida GDP could be generated as the result of *induced* economic activities. **In total, the added educational investment could generate over \$1.1 billion in GDP for the State.**

Table 13 summarizes the Florida GDP that could be created in each economic sector as a result of the added State support for higher education. **The Knowledge-Based Services sector is estimated to create the largest amount of Florida GDP with 81 percent of the total Florida GDP.**

Industry	Total Impact
Knowledge-Based Services	924,106
Government & Other	86,109
Retail Trade	48,977
Wholesale Trade & Transportation	43,943
Visitor Industry	23,481
Manufacturing	12,781
Construction	2,874
Total All Industries	\$1,142,271
Source: The Washington Economics Group, Inc.	

A final and comprehensive measure of the **total economic impact** resulting from an increase in State support for higher education is *Gross Economic Output*, representing the sum of gross revenues (receipts) of private firms plus the value of government services (valued at cost). **The total economic impact of the added education expenditures for higher education is estimated at just over \$1.937 billion – potentially a significant economic impact.** Of this total, an estimated \$1 billion could be created by *direct* activities, while an additional \$937 million could be created by *indirect* and *induced* activities. Table 14 below shows the industry distribution of the total economic impact.

Industry	Total Impact
Knowledge-Based Services	1,587,567
Government & Other	110,010
Retail Trade	74,577
Wholesale Trade & Transportation Services	69,986
Manufacturing	45,020
Visitor Industry	43,238
Construction	6,807
Total All Industries	\$1,937,204

Source: The Washington Economics Group, Inc.

In addition to the various economic impacts presented, the additional State support of higher education has the potential to create positive fiscal revenue impacts as shown in Table 15 below.

Each year that the State increases its support of higher education by \$1 billion, almost \$280 million in fiscal revenues are created. Of the total revenues created, \$212 million, or 76 percent, would flow to the federal government, and the remaining \$67.8 million, or 24 percent, of tax revenues would be allocated to state and local governments.

Taxes Paid By	Federal Taxes	State/Local Taxes	Total Taxes
Labor	\$ 93,163	\$ 1,714	\$ 94,877
Capital	2,741	-----	2,741
Households	90,959	5,563	96,522
Corporations	19,168	7,011	26,179
Indirect Business Taxes	5,958	53,486	59,444
Total:	\$211,989	\$67,774	\$279,763

Source: The Washington Economics Group, Inc.

VI. THE POSITIVE ECONOMIC IMPACTS FLOWING FROM “POTENTIAL INCOME CREATED” AS A RESULT OF INDIVIDUALS BEING EDUCATED

Increased expenditures associated with additional public support for higher education will also result in more individuals being educated and obtaining degrees. These individuals will have additional opportunities and larger incomes as a consequence of having a college or university degree. A decision by the State to increase its support of higher education by \$1 billion per annum will, based on recent educational outcomes, increase the number of degrees granted each year by 9.78 percent, resulting in 10,749 additional degrees being conferred each year. Census Bureau data for Florida suggests that these “additional opportunities to obtain a college or university degree” will result in \$146 million in “potential income created” on the part of Florida residents each year. This “potential income created” could generate economic impacts that extend beyond those **directly** related to the “potential income created”. These “spillover” or multiplier impacts are the result of each business activity’s supply relationships with other firms operating within the region, the proportion of Gross Domestic Product (GDP)²² that accrues to households in the form of labor and capital income, and the propensity of households to spend income on goods produced within the local area.

The \$146 million in potential income created discussed above constitutes the *direct* economic impact entered into the IMPLAN model for the State of Florida. Based on this, the IMPLAN model estimates the *direct* impacts for employment, labor income, public-sector fiscal revenues and Florida Gross Domestic Product. The IMPLAN model also estimates *indirect* and *induced* economic impacts of the potential income created for all variables. These comprehensive *direct*, *indirect* and *induced* economic impacts are summarized in Table 16 below. It should be noted that these impacts are **in addition** to the impacts of the additional State expenditures for higher education which were discussed in the prior section.

<i>Impact on</i>	<i>Direct</i>	<i>Indirect & Induced</i>	<i>Total Impact</i>
Employment (Jobs)	15,866	1,281	17,147
Labor Income (\$ Mill.)	169	47	216
Florida Gross Domestic Product (GDP \$ Mill.)	146	88	234
Federal, State & Local Tax Revenues (\$ Mill.)	-----	-----	57
Total Economic Impact (\$ Mill.)	146	143	289

Source: The Washington Economics Group, Inc.

²²The GDP of an area represents the net economic value created through the local production of goods and services. This economic value is used to compensate workers, pay taxes, and provide a return to investors in these business activities.

An estimated 17,147 permanent jobs for Florida residents could be created as a result of the potential income generated from the additional degrees obtained. The potential income created could be *directly* responsible for 15,866 permanent jobs in the Knowledge-Based Services and in other sectors of the Florida economy.

The additional degrees granted and the associated potential income created could result in an *indirect* and *induced* job creation process affecting all sectors of the Florida economy. This dramatically demonstrates the close supply inter-relationships that the Knowledge- Based Services sector has with all of the other sectors of the State’s economy. Specifically, 1,281 permanent jobs could be created in all sectors of the local economy as the result of the *induced* spending effects of the potential income created. **Therefore, the total number of permanent jobs for Florida residents, directly, indirectly and induced, resulting from the potential income created, is estimated at 17,147 – jobs that could make a significant contribution to employment opportunities in Florida.**

The number of permanent jobs estimated by the IMPLAN model that could be generated in each economic sector due to the potential income created is summarized in Table 17. Of the 17,147 jobs, 97 percent are in the Knowledge-Based Services sector, 2 percent are in the Retail Trade sector, and the remaining 1 percent is distributed among other economic sectors.

<i>Industry</i>	<i>Jobs Supported</i>
Knowledge-Based Services	16,595
Retail Trade	259
Visitor Industry	148
Wholesale Trade & Transportation Services	83
Government & Other	34
Manufacturing	22
Construction	5
<i>Total All Industries</i>	<i>17,147</i>
Source: The Washington Economics Group, Inc.	

The potential income created resulting from increases in State support for higher education could also have a significant impact on Labor Income for the State’s workers. Labor Income is the total value of compensation to all workers. In addition to the \$169 million of Labor Income *directly* resulting from the potential income created, \$47 million of Labor Income could be generated by increases in *induced* economic activities.

In summary, the potential income created associated with the added support for higher education has the possibility of generating over \$216 million in Labor Income for Florida residents, with the largest proportion of income in the Knowledge-Based Services sector as shown in Table 18 below.

Table 18. Labor Income Generated by the Potential Income Created Due to a \$1 Billion Increase in State Support for Higher Education (\$ in thousands)	
Industry	Total Impact
Knowledge-Based Services	197,510
Retail Trade	7,464
Wholesale Trade & Transportation Services	4,585
Visitor Industry	3,074
Government & Other	2,035
Manufacturing	1,221
Construction	251
Total All Industries	\$216,138
Source: The Washington Economics Group, Inc.	

Florida Gross Domestic Product (GDP) resulting from the potential income created by these added expenditures is another measure of economic development benefits from the State's support of higher education. The GDP of an area represents the net economic value created through the local production of goods and services. This net economic value is used to compensate workers, pay taxes, and provide a return to investors in the business activities. GDP is also the principal source of household income and a key measure of the contributions that the State's support of higher education makes to the Florida economy. The potential income created by the additional support of higher education could generate over \$146 million of Florida GDP *directly*, while \$88 million of Florida GDP can be generated as the result of *induced* economic activities. **In total, the potential income created associated with the added support of higher education could generate over \$234 million in GDP for the State** (Table 19).

Table 19. Florida GDP Arising from Potential Income Created by a \$1 Billion Increase in State Support for Higher Education (\$ in thousands)	
Industry	Total Impact
Knowledge-Based Services	187,309
Government & Other	20,322
Retail Trade	11,986
Wholesale Trade & Transportation	7,362
Visitor Industry	4,547
Manufacturing	2,002
Construction	258
Total All Industries	\$233,785
Source: The Washington Economics Group, Inc.	

Table 19 on the previous page summarizes the Florida GDP estimated to arise from the potential income created by additional State support for higher education in each economic sector. **The largest amount of Florida GDP generated by this is estimated to occur in the Knowledge-Based Services sector where about 80 percent of the Florida GDP is located.**

A final and comprehensive measure of the **total economic impact** arising from the potential income created by the increased State support for higher education is *Gross Economic Output*, representing the sum of gross revenues (receipts) of private firms plus the value of government services (valued at cost). **The total economic impact associated with the potential income created by additional State support for higher education is estimated at just over \$289 million – potentially a significant economic impact.** Of this total, an estimated \$146 million arises from *direct* activities, while an additional \$143 million arises from *indirect* and *induced* activities. Table 20 shows the industry distribution of this total economic impact.

Table 20. Economic Output Arising from Potential Income Created as a Result of Increased State Support for Higher Education (\$ in thousands)	
<i>Industry</i>	<i>Total Impact</i>
Knowledge-Based Services	217,812
Government & Other	25,252
Retail Trade	18,252
Wholesale Trade & Transportation Services	10,743
Visitor Industry	8,645
Manufacturing	7,738
Construction	588
<i>Total All Industries</i>	<i>\$289,030</i>
Source: The Washington Economics Group, Inc.	

In addition to the various economic impacts presented, the potential income created resulting from increased State support of higher education yields increased fiscal revenue impacts as shown in Table 21 on the next page. Each year that the State increases its support of higher education, the potential income created results in over \$56.5 million of fiscal revenues being generated. Of the total revenues created, \$46.4 million, or 82 percent, would flow to the federal government, and the remaining \$10.1 million, or 18 percent, of tax revenues would be allocated to state and local governments.

Table 21. Annual Fiscal Revenues Resulting from the Potential Income Created by an Increase in State Support of Higher Education (\$ in thousands)

Taxes Paid By	Federal Taxes	State/Local Taxes	Total Taxes
Labor	\$ 19,351	\$ 356	\$ 19,707
Capital	2,252	-----	2,252
Households	23,104	1,413	24,517
Corporations	750	274	1,024
Indirect Business Taxes	903	8,106	9,009
Total:	\$46,360	\$10,149	\$56,509
Source: The Washington Economics Group, Inc.			

In conclusion, there are significant positive impacts from increased funding for higher education at the State level. These positive impacts include additional economic activity and increased earnings potential for the labor force. The benefits of cumulative investment increases in education definitely impact societal well-being and the future standard of living of all Floridians.

VII. THE QUANTIFIABLE SOCIAL RETURN ON INVESTMENT (ROI) TO FLORIDA TAXPAYERS FROM INVESTMENTS IN HIGHER EDUCATION



Income for Florida’s workers along with State and local tax revenues and total economic output is generated through the processes of economic activity and growth. Sales taxes are collected as consumers spend their income, and firms pay a variety of production taxes, payroll-related taxes and corporate income taxes. Tangible and intangible property taxes are also paid by both consumers and producers. The modeling approach we have used in this study explicitly considers the relationship between the combination of income received by Florida’s workers and government revenues and economic activity. Therefore, this data provides a framework for estimating the returns to Florida from

incremental investments in higher education in the State.

In this study, we have analyzed the economic impacts associated with a \$1 billion annual increase in support for higher education. These impacts take two forms, first the positive impacts associated with the increases in spending by the State’s institutions of higher education. Secondly, we set forth the impacts associated with the “potential income created” associated with the higher levels of human capital creation (the increase in the number of degrees awarded annually). These impacts were set forth in the previous sections.

This analysis demonstrates that for every dollar spent by the State to support higher education, an aggregate total of \$2.2 billion in economic output is created. This reveals that the State’s support for higher education is more than fully recovered by Florida’s citizens and government. For each dollar spent by the State, Florida’s population would receive a return of 220 percent on its investment.

It should be noted that this study does not attempt to quantify the additional labor income and fiscal impacts that occur from increased business activity and productivity as the additional capital created by the educational activities is applied to productive endeavors throughout the State. Therefore, the gains in economic output are likely to exceed the \$2.20 per dollar of educational spending identified above.

The economic impacts that have been estimated may be evaluated in terms of a "rate of return" on the State support of higher education. The rate of return calculation employs standard financial methods and indicates that the State expenditures for higher education generate a rate of return of 220 percent.

The Social Return on Investment (ROI) of Higher Education Expenditures	
Social Impact (Economic Output):	\$2.2 billion per year
State Investment in Higher Education	\$1.0 billion per year
ROI: $\\$2.2/\\$1.0 = 220$ percent	
For every dollar of increased higher education funding by the State, Florida residents receive a 220 percent return on their investment	

The Social ROI is estimated in terms of total economic impact on Florida's economy. These quantifiable economic benefits are only one component of the societal benefits from educational investments in our higher education system. Among educational benefits presented in this study are the increased ability to attract to Florida high-value added industries that require a steady and growing supply of talent, a reduction of social pathologies on society and an improvement in the quality of Florida communities in addition to many other externality benefits.

APPENDIX I
METHODOLOGY

IMPLAN MODEL

The multiplier impacts calculated by the IMPLAN model are based on input-output methodology, which explicitly considers the inter-industry linkages that exist within an economy. Each industry needs labor and inputs from other industries in order to produce economic output. Whenever an industry experiences an increase in the demand for its output, many other industries within that economy indirectly experience an increase in demand as well because of these inter-industry linkages. This increase in demand that results from the need for material inputs is called the *indirect effects*. In addition, an increase in production within a region also leads to an increase in household income through the hiring of workers, which in turn generates further demands for goods and services within the region. Firms also need to expand their base of physical capital to meet higher levels of demand, and this too stimulates regional economic growth. The latter effects are referred to as *induced effects*. The inter-industry linkages and the induced effects on consumer and capital spending lead to successive rounds of production, and this process results in an increase in output that exceeds the initial change in demand, or a *multiplier effect*. Similarly, the increase in household income will exceed the initial payroll increase encountered in the industry that experienced the original increase in demand. The total change in employment in the regional economy is a multiple of the direct change in employment.

The following represents the system of equations that comprise the regional economy in an extended input-output model like IMPLAN:

$$\begin{aligned}x_1 &= a_{11}x_1 + a_{12}x_2 + a_{13}x_3 + \cdots + a_{1k}x_k + a_{1h}x_h + a_{1i}x_i + f_1 \\x_2 &= a_{21}x_1 + a_{22}x_2 + a_{23}x_3 + \cdots + a_{2k}x_k + a_{2h}x_h + a_{2i}x_i + f_2 \\x_3 &= a_{31}x_1 + a_{32}x_2 + a_{33}x_3 + \cdots + a_{3k}x_k + a_{3h}x_h + a_{3i}x_i + f_3 \\&\vdots \\x_k &= a_{k1}x_1 + a_{k2}x_2 + a_{k3}x_3 + \cdots + a_{kk}x_k + a_{kh}x_h + a_{ki}x_i + f_k \\x_h &= a_{h1}x_1 + a_{h2}x_2 + a_{h3}x_h + \cdots + a_{hk}x_k + a_{hh}x_h + a_{hi}x_i + f_h \\x_i &= a_{i1}x_1 + a_{i2}x_2 + a_{i3}x_h + \cdots + a_{ik}x_k + a_{ih}x_h + a_{ii}x_i + f_i\end{aligned}$$

The variables x_1 to x_k represent total production of output in each industry. The coefficients a_{ij} represent the purchases from industry “i” that are needed to produce a dollar of output in industry “j”. These are known as the *direct requirement* coefficients. The variable x_{ih} refers to household income and the coefficients a_{ih} refer to the average amount of household income spent on purchases from industry “i”, or the *average propensities to consume*. The coefficients a_{hi} are similar to the inter-industry purchases (a_{ij} ’s), but they represent the household income that is generated from each dollar of output produced in industry “i”. Similarly the variable x_j represents regional spending on capital goods, and the coefficients a_{ij} represents the spending on capital goods for each dollar of output produced in industry “j”. The coefficients a_{ji} represent the amount purchased from industry “j” for each dollar spent on capital goods within the region. The variables f_j represent the exogenous final demand faced by each industry, respectively.

This system of equation reduces, using matrix notation, to the following solution for industry output and household income:

$$X = (I - A)^{-1} F$$

X is the vector of industry outputs plus household income and F is a vector of exogenous final demands. The “output multipliers” (i.e., the change in industry output and household income that results from a change in final demand for the output of a particular industry) are given in the columns of the $(I-A)^{-1}$ matrix. The IMPLAN software calculates these multipliers for counties, states and other sub-state regions. These multipliers can be used to provide a sense of the economic importance of an industry or an economic activity in a given region. The multipliers impacts for gross state product, labor and capital income and the government revenue impacts are derived from the basic output multipliers given by $(I-A)^{-1}$.

The IMPLAN model uses historical relationships between public-sector revenues and regional economic output in order to estimate the public-sector revenue impact resulting from the establishment of a new, or expansion of an existing economic activity.

APPENDIX II
THE WASHINGTON ECONOMICS GROUP, INC.
PROJECT TEAM AND QUALIFICATIONS



J. ANTONIO "TONY" VILLAMIL

Dean, School of Business of St. Thomas University of Florida
and Principal Advisor of
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Tony Villamil has over thirty years of successful experience as a business economist, university educator and high-level policymaker at both federal and state governments. He has served as a Presidential appointed U.S. Undersecretary of Commerce for Economic Affairs, and is the founder of a successful economic consulting practice, The Washington Economics Group, Inc. (WEG). Since August 2008, Tony is the Dean of the School of Business of St. Thomas University of Miami, while continuing to serve as senior advisor to the clients of WEG.

Tony is a member of the President's Advisory Committee on Trade Policy and Negotiations in Washington, D.C. He is the immediate past Chairman of the Governor's Council of Economic Advisors of Florida, and during 1999-2000, he directed the Tourism, Trade and Economic Development activities of the State in the Office of Governor Jeb Bush. Presently, he is on the Board of Directors of the Spanish Broadcasting System (NASDAQ), Mercantil Commercebank, N.A. and Enterprise Florida – the State's principal economic development organization.

Among other leadership positions, he served in 2008 as the economist of the Constitutionally mandated Tax and Budget Reform Commission of Florida (TBRC), and is currently Chairman of the Economic Roundtable of the Beacon Council – Miami-Dade County's official economic development organization. He is also a Senior Research Fellow of Florida TaxWatch, an established fiscal and policy research organization of the State. After winning the gubernatorial election in November 2006, then Governor-elect Charlie Crist appointed him as his Economic Advisor during the transition period.

Tony earned bachelor and advanced degrees in Economics from Louisiana State University (LSU), where he also completed coursework for the Ph.D. degree. In 1991, Florida International University (FIU) awarded him a doctoral degree in Economics (hc), for "distinguished contributions to the Nation in the field of economics." He speaks frequently to business, government and university audiences on economic topics, and was until the summer of 2008 a member of the Graduate Business Faculty of Florida International University (FIU).



CHARLES K. YAROS
Associate Consultant for Economics

Chuck Yaros is an Associate Consultant for Economics at The Washington Economics Group, Inc. (WEG). He serves as economic consultant in the areas of financial economics and economic impact studies. Prior to joining WEG he was a Vice President and Portfolio Strategist at Shay Financial Services in Miami where he specialized in developing, implementing and managing interest rate risk and capital optimization strategies for financial institutions.

Mr. Yaros has over 20 years of experience as a business and financial economist, having worked in a number of positions of progressive responsibility in the South Florida business community. Additionally, he has spoken and taught courses on financial risk management.

Chuck received his undergraduate degree in Economics with Honors from Trinity College and his Master's degree in Economics from Duke University, where he also completed course work for the Ph.D. degree.

Chuck and his family are residents of Coral Gables, Florida.



CLAUDIA H. WEHBE

Associate Consultant for Economics
The Washington Economics Group, Inc.

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Claudia Wehbe is an economist with strong applied econometrics and quantitative skills, and over ten years experience in corporate finance, business consulting and project management. She has performed highly competitive and diversified activities in private, public and academic institutions, both in Argentina and the US. In Argentina, she worked as an accountant, business consultant and financial analyst in her own consulting practice, showing a successful track record of business solutions. She also worked as an expert witness for Poder Judicial de la Provincia de Córdoba and was elected manager of Consejo Profesional de Ciencias Económicas de Córdoba, Delegación Río Cuarto. She was awarded a Fulbright scholarship to get her Master's degree in Economics in the US. She later got her PhD in Economics at Florida International University and acquired further experience in the US as a financial, budget and project analyst in high responsibility positions at CB Richard Ellis and The Related Group.

Dr. Wehbe also has extensive academic experience, which she acquired at the prestigious Universidad Nacional de Río Cuarto in Argentina, where she taught economics, business and finance graduate and undergraduate courses for over nine years. She was a member of Consejo Directivo at Facultad de Ciencias Económicas, participating in executive academic decisions at the Budget and Economic Commissions, as well as a researcher at Instituto de Desarrollo Económico. She got awards, published numerous papers in the fields of economics, management and business, and traveled extensively throughout Argentina presenting them. She has taught numerous economics courses at Florida International University, and is currently an Adjunct Faculty at the Economics Department.

Claudia is well trained in using state-of-the-art econometric estimation methods on panel data and presenting reports to diverse audiences and at different levels of complexity. She specializes in economic analysis, economic development, political economy, and financial and monetary issues. She is on the Board of Directors of CEGA Miami Chapter (Centro de Estudiantes y Graduados Argentinos en los Estados Unidos), acting as its Treasurer. She is fully bilingual (Spanish-English) and she is a resident of Miami Dade County.



MARY SNOW
Manager of Client Services

Mary Snow is the Manager of Client Services at The Washington Economics Group, Inc. (WEG). She serves as WEG's client liaison, working with clients to facilitate their business interests and achieve their goals.

Prior to joining WEG, Mary was a governmental consultant for Robert M. Levy & Associates with offices in Miami and Tallahassee. She represented clients' interests at the local level and to the State Legislature.

Mary received her undergraduate degree in Political Science with a minor in Education from Florida State University. Mary is a resident of Coral Gables, Florida.



HAYDEE M. CARRION
Executive and Research Assistant

Haydee Carrion is Executive and Research Assistant of the firm, specializing in the preparation and design of reports and documents for clients. Significant experience in data computerization, research through the Internet and in Desktop Publishing.

Ms. Carrion has over twenty year of experience in administrative and office management activities, primarily in a research environment that requires independent judgment and the use of electronic research.

She received her A.A. and A.S., from Miami Dade College, in Business Administration and Office System Technologies, pursuing B.A. degree in Economics.

The Washington Economics Group, Inc. (WEG) has been successfully meeting client objectives since 1993 through economic consulting services for corporations, institutions and governments of the Americas. We have the expertise, high-level contacts, and business alliances to strengthen your competitive positioning in the growing marketplaces of Florida and Latin America.

Our roster of satisfied clients, over the past fourteen years, includes multinational corporations, financial institutions, public entities, and non-profit associations expanding their operations in the Americas.

EXCLUSIVE CONSULTING APPROACH:

Each client is unique to us. We spend considerable time and effort in understanding the operations, goals, and objectives of clients as they seek our consulting and strategic advice. We are not a mass-production consulting entity nor do we accept every project that comes to us. We engage a limited number of clients each year that require customized consulting services in our premier areas of specialization. These premier and exclusive services are headed by former U.S. Under Secretary of Commerce, Dr. J. Antonio Villamil, with over twenty-five years of experience as a business executive and as a senior public official of the U.S. and most recently of Florida.

PREMIER CONSULTING SERVICES:

Comprehensive Corporate Expansion Services. Our seamless and customized service includes site selection analysis, development of incentive strategies and community and governmental relations.

Economic Impact Studies highlight the importance of a client's activities in the generation of income, output and employment in the market area serviced by the entity. These studies are also utilized to analyze the impact of public policies on key factors that may affect a client's activities such as tax changes, zoning, environmental permits and others.

Strategic Business Development Services. These services are customized to meet client objectives, with particular emphasis in the growing marketplaces of Florida, Mexico, Central and South America. Recent consulting assignments include customized marketing strategies, country risk assessments for investment decisions and corporate spokesperson activities and speeches on behalf of the client at public or private meetings.

For a full description of WEG capabilities and services, please visit our website at:
www.weg.com

**Representative Client List
1993-2007**

MULTINATIONAL CORPORATIONS

- Lockheed Martin
- FedEx Latin America
- IBM
- Motorola
- SBC Communications
- Ameritech International
- Lucent Technologies
- MediaOne/AT&T
- Joseph E. Seagram & Sons, Inc. (Vivendi)
- Microsoft Latin America
- Carrier
- Medtronic
- Phelps Dodge
- Esso Inter-America
- Visa International
- MasterCard International
- Telefonica Data Systems
- Bureau Veritas (BIVAC)
- Merck Latin America
- DMJM & Harris
- Wilbur Smith Associates
- PBSJ

FLORIDA-BASED CORPORATIONS

- Sprint of Florida
- Florida Marlins
- Flo-Sun Sugar Corp.
- Farm Stores
- The BMI Companies
- Spillis Candela & Partners
- The Biltmore Hotel/Seaway
- Trammel Crow Company
- Advantage Capital
- WCI Development Companies
- Iberia Tiles
- Florida Hospital
- Mercy Hospital
- The St. Joe Companies
- Florida Power & Light (FPL)
- International Speedway Corporation

LATIN AMERICA-BASED INSTITUTIONS

- Federation of Inter-American Financial Institutions (FIBAFIN)
- The Brunetta Group of Argentina
- Association of Peruvian Banks
- Peruvian Management Institute (IPAE)
- *Mercantil Servicios Financieros, Venezuela*
- Allied-Domecq, Mexico
- Fonalledas Enterprises

FINANCIAL INSTITUTIONS

- International Bank of Miami
- Pan American Life
- ABN-AMRO Bank
- Barclays Bank
- Lazard Freres & Co.
- Banque Nationale de Paris
- HSBC/Marine Midland
- Fiduciary Trust International
- Sun Trust Corporation
- First Union National Bank (Wachovia)
- Union Planters Bank of Florida (Regions)
- Bank Atlantic Corp.
- Hemisphere National Bank
- BankUnited, FSB
- Mercantil Commercebank N.A.
- PointeBank, N.A.
- The Equitable/AXA Advisors

**PUBLIC INSTITUTIONS, NON-PROFIT
ORGANIZATIONS & UNIVERSITIES**

- Baptist Health Systems
- Jackson Health Systems
- Miami-Dade Expressway Authority
- Miami-Dade College
- Miami Museum of Science
- Zoological Society of Florida
- Florida International University
- University of Miami
- Inter-American Development Bank (IDB)
- United Nations Economic Development Program (UNDP)
- *Universidad Politécnic de Puerto Rico*
- *Sistema Universitario Ana G. Méndez (SUAGM)*
- Keiser University
- Full Sail Real World Education
- Florida Ports Council
- Florida Sports Foundation
- Florida Citrus Mutual
- Florida Nursing Homes Alliance
- Florida Bankers Association
- Florida Outdoor Advertising Association
- City of Plantation
- City of West Palm Beach
- Econ. Dev. Commission of Lee County
- Econ. Dev. Commission of Miami-Dade (Beacon Council)
- Econ. Dev. Commission of Mid-Florida
- Jacksonville Chamber of Commerce
- SW Florida Regional Chamber of Commerce
- Enterprise Florida, Inc.
- The Beacon Council
- Visit Florida
- Louisiana Committee for Economic Development
- University of South Florida/*ENLACE*
- Space Florida
- State of Florida