I. The Human Capital Economy

Economies of states and nations evolve through stages. In the primary stage economies are based on exploitation of natural resources, such as mining, forestry, commercial fisheries and basic agriculture. At the secondary stage economic activity is based on capital investments such as manufacturing and capitalized agriculture. At the tertiary stage economic activity is based on human capital—the productivity of educated minds and healthy bodies of workers. While economies include all three stages, in economic evolution each stage dominates for a while, then is replaced by the next stage of development. The industrial democracies of the world are now competing in this third stage, which is based on the productivity of the trained and skilled human mind.

A. Production of Goods and Services

Since World War II the economy of the United States has been transformed from goods production to service providing. This shift is measured in two broad ways: shares of employment and shares of Gross Domestic Product.

Employment. The share of all U.S. employment in goods producing industries has declined by 21.0 percentage points between 1939 and 2006 (from 37.6% to 16.6%). The share of jobs in service providing industries has increased by 21.0 percentage points (from 62.4% in 1939 to 83.4% by 2006)[4]. This shift has moved persistently since World War II and shows no signs of abating.

The job share losses in goods producing industries have occurred mainly in agriculture, manufacturing and natural resources/mining. This is work traditionally done by men. The job share gains have occurred in service providing industries such as education and health, professional and business services, leisure and hospitality, financial activities and other services. This work used to be dominated by men, but now is increasingly performed by women.

We only have California data available since 1990, but these national trends are evident here too. Between 1990 and 2007 the share of California's employment:

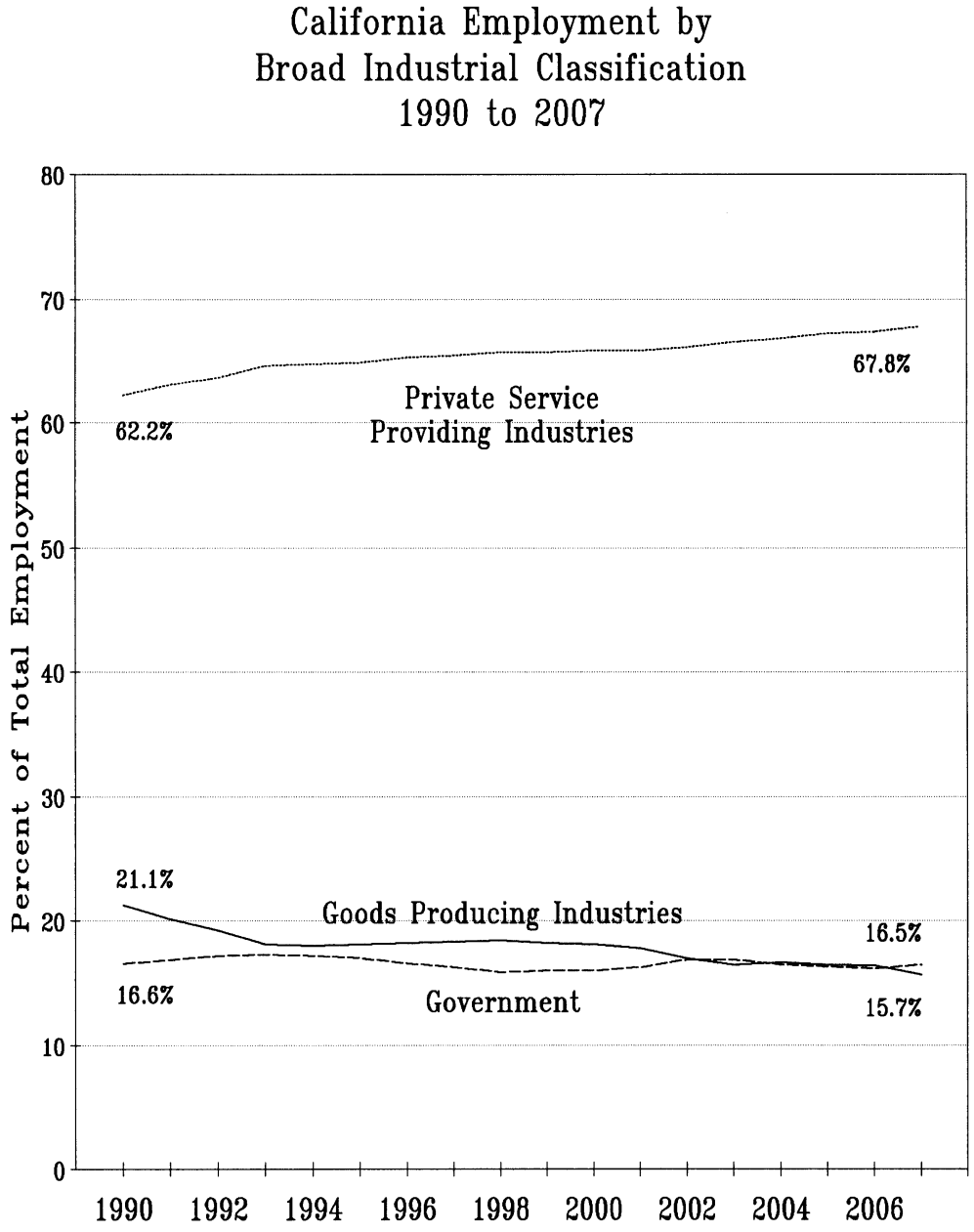
- Increased by 5.6% in private sector service providing industries, from 62.2% to 67.8% of the state total,
- Decreased by 5.4% in goods producing industries, from 21.1% to 15.7%, and
- Decreased by 0.1% in government (public sector service providing industry), from 16.6% to 16.5%.[4]

Gross Domestic Product. Between 1950 and 2007 the durable and non-durable goods share of U.S. Gross Domestic Product (GDP) declined by 15.6 percentage points (from 43.9% to 28.3%). During the same period the services component of GDP rose by 20.6 percentage points (from 21.5% to 42.1%)[5].

This transition from goods production to service provision has been devastating to those who [are] unprepared for it, particularly for males without college educations. At the same time this transition has opened new worlds of employment opportunities for those who have earned college degrees, particularly for females. This is the economic process of creative destruction.

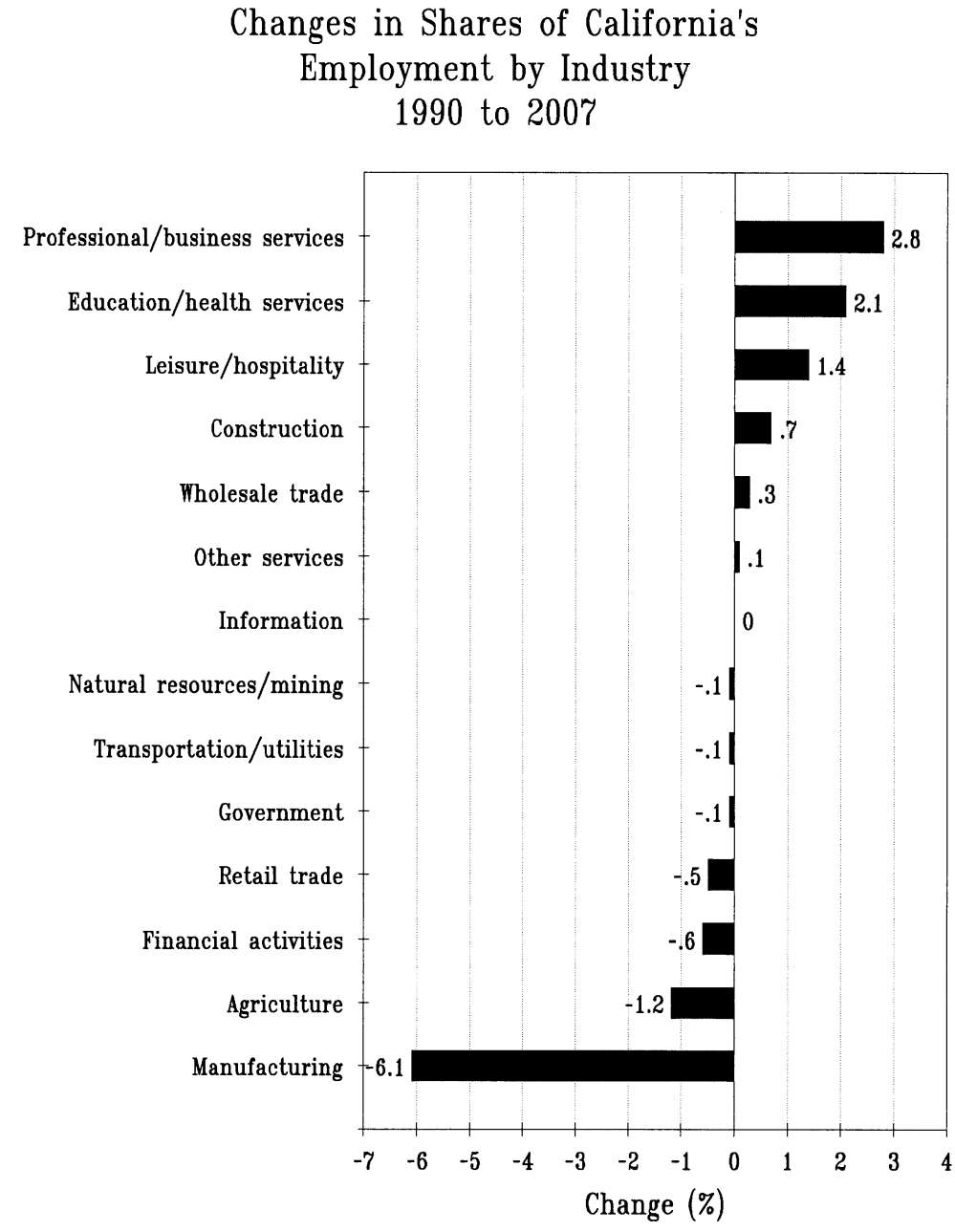
The California gross state product data span 1963 through 2006, and tell a similar story. The share of the state's GSP generated by broad industrial classifications:

- Increased by 16.9% in private sector service providing industries, from 54.4% to 72.3%,
- Decreased by 14.1% in goods producing industries, from 30.8% to 16.7%, and
- Decreased by 2.8% in government, from 13.8% to 11.0%.[5]



Source: Bureau of Labor Statistics

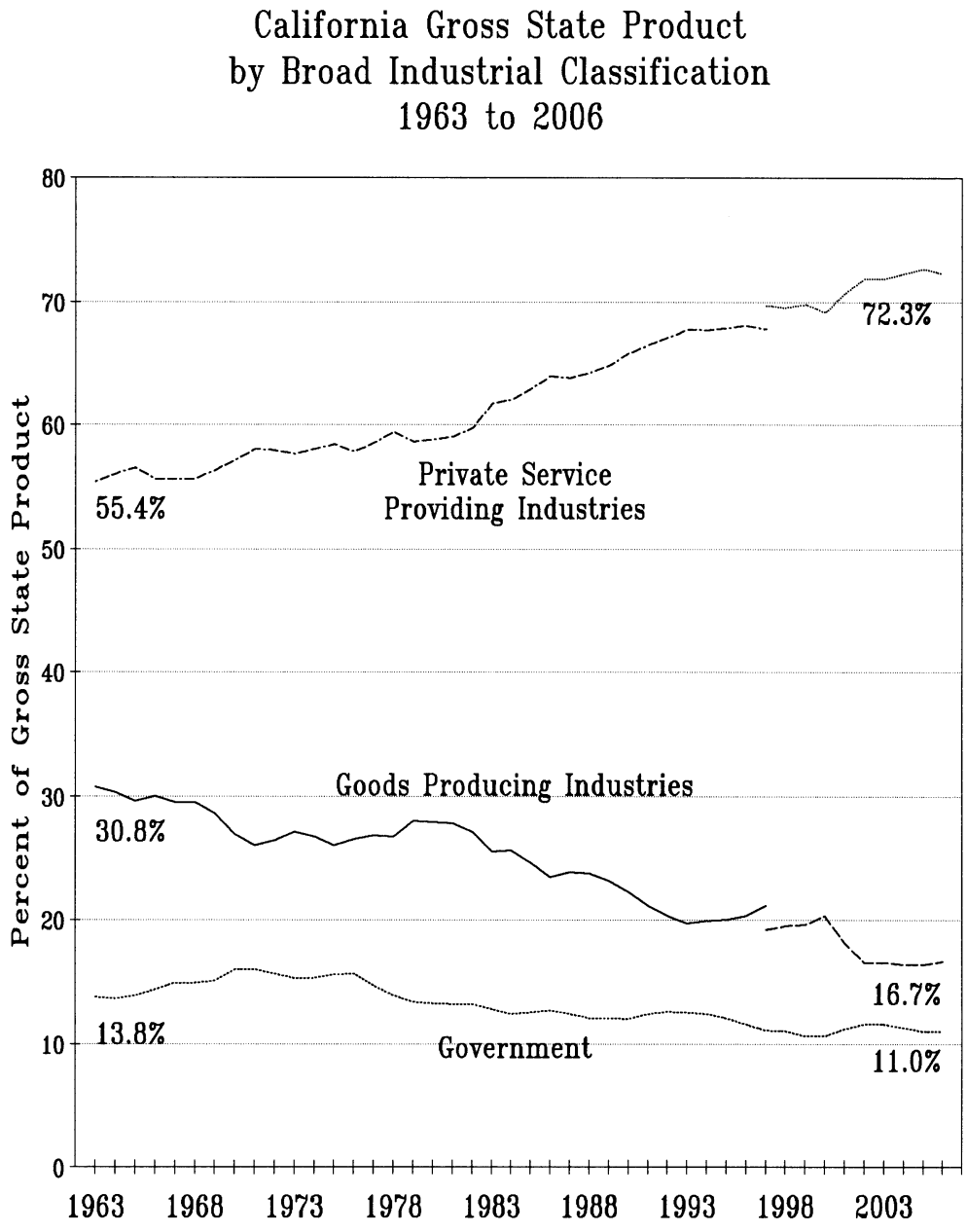
While California clearly has some industrial advantages over other states (information, professional and technical services, administrative and waste services, arts/ entertainment/recreation) the state's economy ebbs and flows with larger national and international economic processes. State public policy making is generally guided by these broader trends and cycles.



Source: Bureau of Labor Statistics

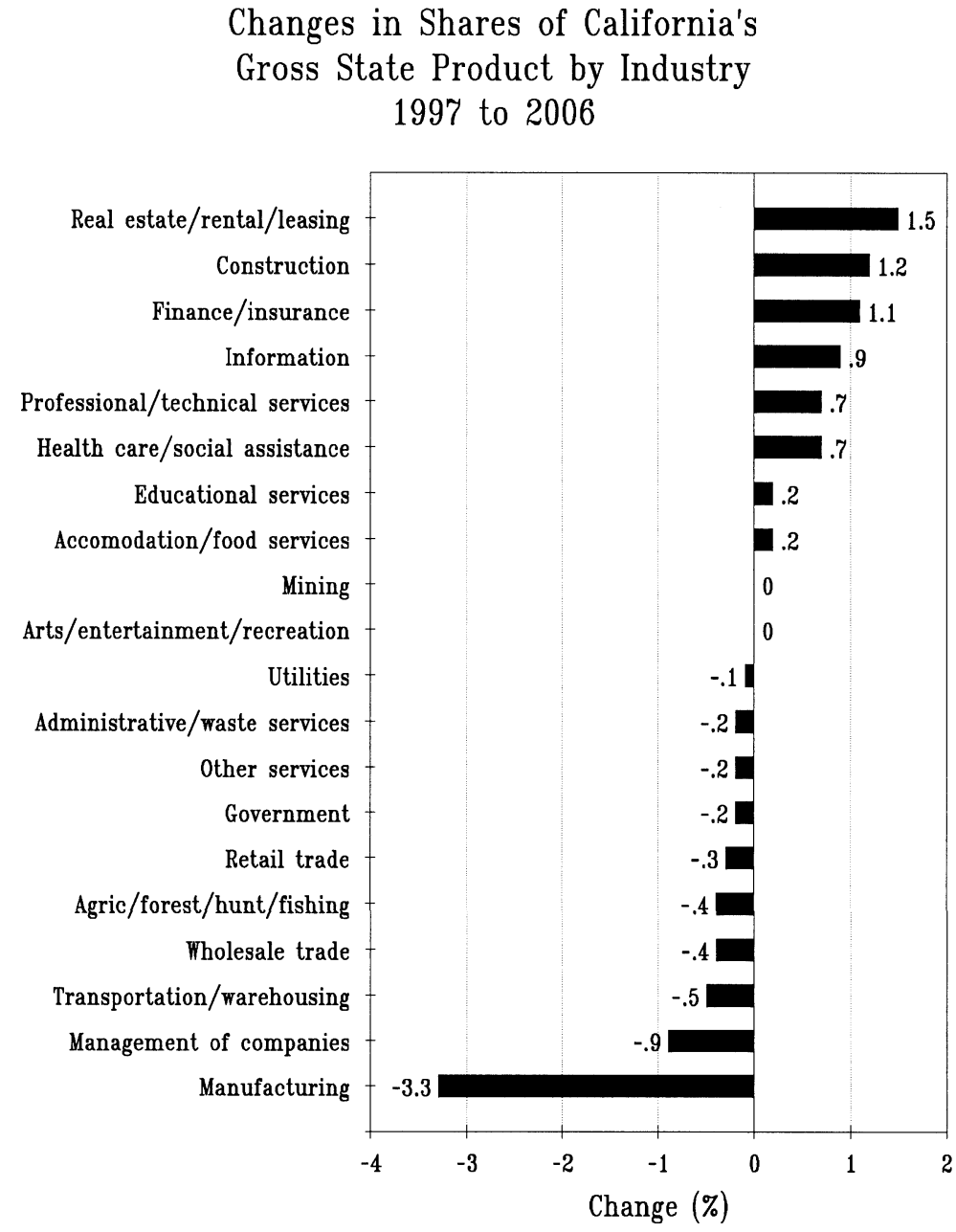
B. The Market Value of Labor

This shift in what the American economy produces has had profound effects on the skill levels required of workers. Goods producing jobs include agriculture, manufacturing, mining, and other activities that needed big, strong men willing to work under dirty, uncomfortable and often dangerous conditions. As these jobs have shrunk both absolutely and relatively, so too have employment opportunities for those with high school educations or less.



Source: Bureau of Economic Analysis

In the Human Capital Economy income and the living standards that income supports have been increasingly determined by the educational attainment of the workforce. No longer is income determined only by hard work and living by the rules of society. Now income is also determined by education. Those who are higher educated are prospering, while others who are not higher educated are in prolonged and very serious economic decline, especially males. Higher education attainment has been redistributing income and human welfare since 1973 and because higher education is so skewed toward students from affluent families it is contributing to growing income inequality.



Source: Bureau of Economic Analysis

This finding that education drives incomes holds for individuals (males, females, all races and ethnicities), families and households, cities, states and the country.

Individuals. There are somewhat different stories for men and women in the development of the Human Capital Economy since 1973:

- For men age 25 and over real median incomes for all males declined by 4.9% between 1973 and 2005 ($38,846 to $36,930). But by levels of educational attainment median incomes of male high school dropouts declined by 36.7% (from $34,176 to $21,620) and for high school graduates real median incomes declined by 27.5% (from $42,936 to $31,122). For males with bachelor's degrees real median incomes declined by 3.4% (from $55,252 to $53,395). For males with advanced degrees real median incomes increased by 16.7% (from $63,529 to $74,153).[6]
- For women age 25 and over real median incomes for all females increased by 65.9% (from $12,954 to $21,488). But for females who were high school dropouts real median incomes increased by 2.3% (from $11,241 to $11,501) and high school diploma recipient's real incomes increased by 9.6% (from $15,737 to $17,242). For females with bachelor's degrees real median incomes increased by 37.0% (from $24,631 to $33,739). For females with advanced degrees real median incomes increased by 38.5% (from $35,421 to $49,070).[6]

A conventional demand/supply interpretation of these data is that the labor market is over-supplied with inadequately educated workers, and it is undersupplied with workers at the highest levels of educational and training. The more immediate message is that the gains made by women have come through increased educational attainment. Men are stuck about where they were at the beginning of the Human Capital Economy due to lack of progress in higher educational attainment.

Families. Most children grow up in families. So we study family incomes (and hence living standards) by educational attainment by head of household--the person in whose name the housing unit is owned or leased.

- For all families real median family income increased by 21.5% between 1973 and 2006 (from $49,600 to $60,275).
- For families headed by persons who started but did not complete high school real median family incomes declined by 24.6% (from $42,580 to $32,090).
- For families headed by persons with a high school diploma only, real median family incomes declined by 8.6% (from $52,275 to $47,784).
- For families headed by persons with a bachelor's degree real median family income increased by 23.2% (from $73,109 to $90,056).
- For families headed by persons with advanced degrees, real median family incomes increased by 23.0% plus (from $81,330 to $100,000+).[6]

Cities. We study the relationships between income and educational attainment in cities and in states differently than we do for individuals and families because there is no single educational attainment level for a city or state, but rather a range. Our conclusion from these studies was that cities with a larger share of college educated adults tended to have higher income and wages.

- *Per capita income*. In 1999 the bivariate correlation between city per capita personal income and the share of those age 25 and over with at least 4 years of college was +.789.[7]
- *Average annual pay*. In 2000 the bivariate correlation between city average annual pay and the share of the population age 25 and over with at least 4 years of college was +.767.[7]

States. The powerful relationships between educational attainment and income that hold for individuals, families and households, and cities also hold for states. Moreover these relationships have been strengthening in the 1990s and 2000s.

- *Per capita income*. In 2006 the bivariate correlation between state per capita personal income and the share of the state's population age 25 and over with 4 years or more of college was +.820. This had increased from +.699 in 1989. Not only was state per capita personal income largely explained by the proportion of adults with 4 years or more of college but this relationship has steadily and substantially strengthened between 1989 and 2006.[7]
- *Median household income*. In 2005 the bivariate correlation between state median household income and the share of state populations age 25 and over with 4 years or more of college was +.712. This had increased from +.660 in 1991 (and +.566 in 1995). In this decade in particular median household income has been increasingly dependent on a college degree.[7]

Globalization. While the Human Capital Economy began in the United States around 1973, it became global around 2000 when the world became flat (according to Tom Friedman). Other countries have observed the relationship of higher education to economic growth in the U.S. and have been very aggressively expanding higher education in their countries while the U.S. has allowed educational progress to stagnate. Data from the Organization for Economic Development and Cooperation reported annually in Education at a Glance[2] have shown that:

- In 2003 the U.S. ranked 2nd (to Norway) among to 30 industrial democracies of the world in the proportion of their 25 to 34 year old populations with at least a bachelor's degree from higher education.
- In 2004 the U.S. dropped to 5th among these countries, and
- In the 2005 report the U.S. dropped to 7th among these countries.

If the trends in place for more than the last decade remain unaltered the U.S. will rank 22nd by 2019 among these 30 countries. Eventually most of the remaining OECD countries (except Greece) will surpass the U.S. too.

C. The Income Tax Revenue Value of Education

Governments tax the incomes, expenditures and wealth of people, and those who have more usually pay more in taxes. People with more education earn more income and typically pay more in taxes. Here we look at the federal income taxes paid by taxpayers with different levels of educational attainment between 1970 and 2005.

The educational attainment of federal income tax payers has increased sharply between 1970 and 2005. The share with any college education has increased from 25.4% in 1970 to 55.8% by 2005. During the same period the share of taxpayers with 4 years or more of college increased from 13.6% in 1970 to 29.0% by 2005.

The share of all income earned by these groups has increased even faster. Between 1970 and 2005 the share of all income earned by taxpayers with any college education increased from 35.6% to 70.4%. The share of all income earned by taxpayers with 4 years or more of college increased from 21.8% in 1970 to 44.6% by 2005.

And the share of all federal income taxes paid increased the fastest. Between 1970 and 2004 the share of all federal income taxes paid by taxpayers with any college education increased from 41.6% to 76.6%. The share of all federal income taxes paid by taxpayers with 4 years or more of college increased from 26.7% in 1970 to 52.5% by 2004.

These data may be expressed another way to tell this powerful story. By 2004:

- Taxpayers with 1 to 3 years of high school were 8.7% of all taxpayers. They earned 4.4% of the income, and they paid 2.6% of federal income taxes.
- Taxpayers with a high school diploma only were 30.3% of all taxpayers, they earned 23.3% of all income and they paid 19.5% of federal income taxes.
- Taxpayers with 1 to 3 years of college were 26.4% of all taxpayers, earned 25.7% of all income and paid 24.1% of all federal income taxes.
- Taxpayers with 4 years of college were 18.4% of all taxpayers, earned 25.4% of all income and paid 27.4% of all federal income taxes.
- Taxpayers with 5 years or more of college were 10.3% of all taxpayers, earned 18.6% of all income and paid 25.2% of all federal income taxes.[7]

The complementary story to these data is the cost to society of the least educated. For men these are usually police/judicial/prisons costs. For women these are most often welfare costs. Instead of contributing to social welfare, the least educated consume disproportionate shares of society's scarce tax resources.

D. Correlates of Educational Attainment

Individuals. Higher education provides a wide array of important benefits to those who receive it.

- People with more education are more likely to be in the labor force, to have jobs, and less likely to be unemployed than people with less education.
- People with more education have higher incomes than do people with less education. People with less education are more likely to live in poverty than are people with more education.
- People with more education are more likely to have health insurance, pension plans, their own retirement accounts, own their own homes, have interest earning assets, own their own businesses, and own rental property than are people with less education.
- People with more education are less likely to smoke tobacco, more likely to work in locations that prohibit smoking, and less likely to use illicit drugs than people with less education.
- When they are older people with more education are more likely to be screened for colorectal cancer and prostate cancer, get pap smears and mammograms, use dietary supplements, see dentists and doctors more frequently, and see a doctor in his office.
- People with less education are more likely to use clinics or health centers, and hospital emergency rooms or outpatient services.
- People with more education are less likely to experience feelings of sadness, hopelessness, worthlessness, and to feel everything is an effort than are people with less education. People with more education report being happier than do people with less education.
- People with more education are less likely to experience disease and conditions of coronary, hypertension, stroke, diabetes, ulcers, kidney disease, liver disease, arthritis diagnosis, chronic joint symptoms, migraines and severe headaches, pains, in the neck, lower back and jaw or face than people with less education.
- Mothers with more education are more likely to breast-feed their babies and have lower infant mortality rates than mothers with less education.

- People with more education have greater muscular strength and endurance than do people with less education. They get more vigorous leisure time activity than do people with less education.
- People with more education are better able to walk a quarter of a mile, climb up to 10 steps without resting, stand for 2 hours, sit for 2 hours, stoop, bend or kneel, reach over head, grasp or handle small objects, lift or carry 10 pounds, and push or pull large objects than people with less education.
- People with more education are more likely to have a healthy body mass index and are less likely to be obese than people with less education.
- People ages 25 to 64 years with more education die at lower rates than do people with less education. This finding holds for both males and females.
- Death rates from cancer are lower among better educated adults, and higher among less well educated adults.

And there are hundreds more of these private correlates of educational attainment.[8] The only private welfare measures where better educated adults are at a disadvantage compared to those who are less well educated are self-reported stress levels, frequency of sexual intercourse and tax burden.

States. The benefits of higher education that accrue to people with higher educations also accrue to the states in which they are located. The share of adults with a bachelor's degree in a state is positively correlated with:

- Median household income (+.826)
- Per capita personal income (+.758)
- Employed/population ratio (+.484)[9]

The share of adults with a bachelor's degree in a state is negatively correlated with:

- Poverty rate (-.612)
- Unemployment rate (-.202)[9]

In each of the above metrics the correlations (either positive or negative) with the share of adults with a bachelor's degree strengthened between 1991 and the most recent year of available data (2004, 2005 or 2006).

Some of these state metrics are more highly correlated with the proportion of adults with at least a high school diploma:

- Employed/population ratio: (+.735)
- Median household income (+.516)
- Per capita personal income (+.336)[9]

Those state metrics that are negatively correlated with the proportion of adults with at least a high school diploma are:

- Poverty rate (-.741)
- Unemployment rate (-.308)[9]

These data indicate that the high school diploma is most important to the reduction of low-end state economic welfare measures such as the employed/population ratio, poverty and unemployment. The college degree is most important to high-end state economic welfare measures such as median household income and per capita personal income.

There are many other state metrics of state well being beyond these key economic measures that are correlated with educational attainment. A few of these additional correlations with the share of adults with at least a bachelor's degree include:

- State average credit score: +.390
- Home ownership: +.328
- Traffic fatality rate: -.641
- Public school teacher's salaries: +.541
- Doctors per 100,000 population: +.643
- Federal aid to state/local governments: +.282
- Energy consumption: -.397
- Infant mortality rate: -.4449

E. Family Income Inequality

Gini Coefficients. In recent decades family income has grown steadily more unequally distributed in the United States. This is a result of the growing income gap between the educated and uneducated in the workforce.

Income inequality is measured in various ways, one of which is called the Gini Coefficient. This is a ratio ranging from zero to one, where a Gini Coefficient of zero means that every person in a population has exactly the same income, and a Gini of one means that one person has all of the income and no one else has any income. In the United States the Gini Coefficient for family incomes is calculated from the decennial census by the Census Bureau.[10] For the U.S. Gini Coefficients have been:

1969: .361
1979: not reported
1989: .414
1999: .434

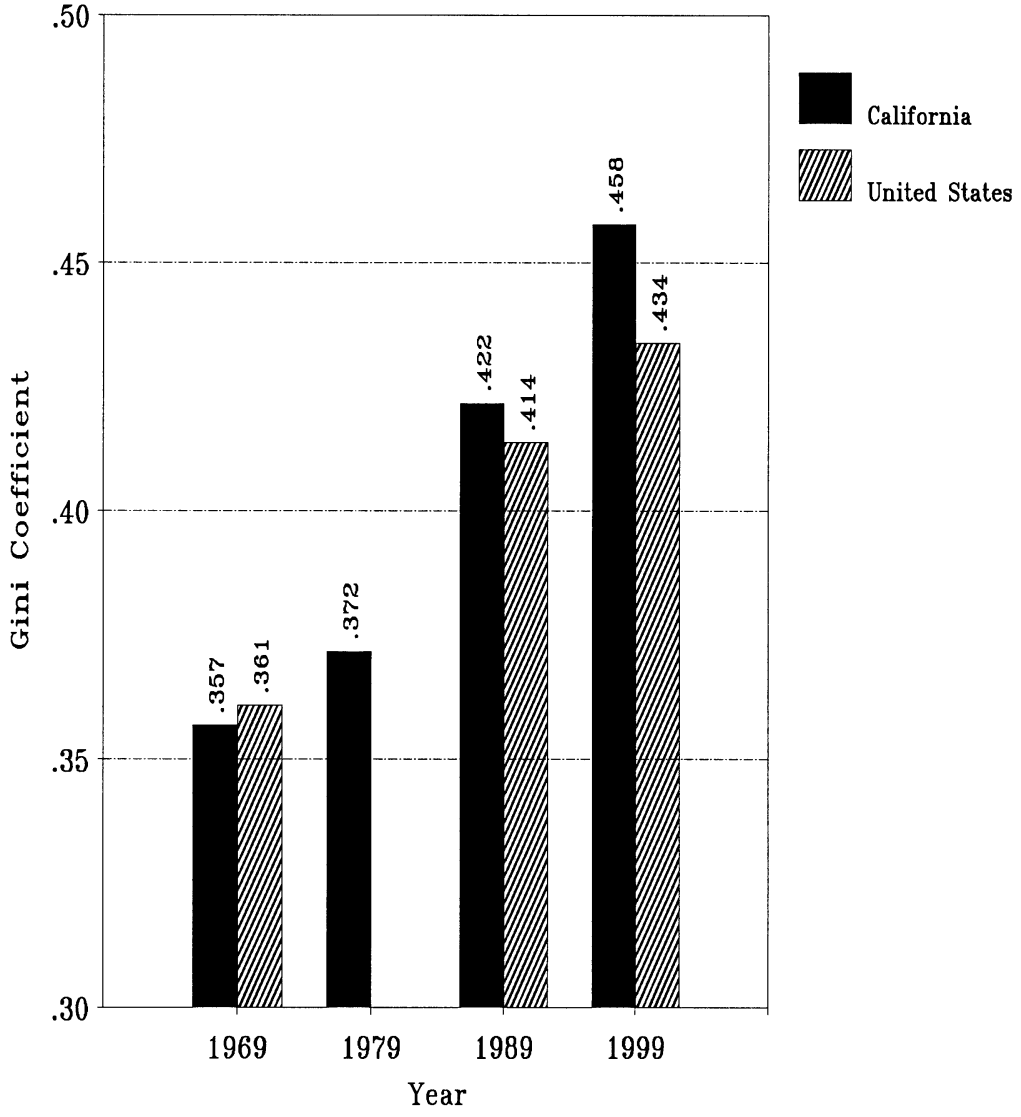
This means that family income has grown more unequally distributed in the United States between 1969 and 1999.

In California family income also grew increasingly unequally distributed between 1969 and 1999. In fact California's Gini Coefficient was less than that of the U.S. in 1969, but by 1999 it was higher. In 1999 California's family income inequality was third only to that of Washington, DC, and New York. (In 1969 California had ranked 24th in family income inequality.) The Gini Coefficients for California family income calculated by the Census Bureau have been:

1969: .357
1979: .372
1989: .422
1999: .458

Family income inequality increased faster in California (+.101) than it did in the U.S. (+.073) between 1969 and 1999.

Family Income Inequality in California and the United States 1969, 1979, 1989 and 1999



Source: Census Bureau

Consequences. There are social characteristics and pathologies across the states associated with high and growing family income inequality like that of California. The following state metrics are positively correlated with state Gini Coefficients for family income in 1999:

- Births to unmarried women (+.72)
- Low birth weight babies (+.69)
- Poverty rate (+.61)
- Average annual pay (+.54)
- Unemployment rate (+.47)
- Metropolitan population share (+.47)
- Infant mortality (+.47)
- Property crime rate (+.45)
- Children without health insurance (+.40)
- Persons without health insurance (+.38)
- Adult college graduates (+.29)
- Per capita personal income (+.27)
- Births to teenage mothers (+.16)

The following state metrics were negatively correlated with state Gini Coefficients in 1999:

- Public high school graduation rate (-.64)
- White population share (-.63)
- Home ownership (-.60)
- Adult high school graduates (-.58)
- Employed/population ratio (-.57)
- Low income student college participation rate (-.28)
- Median household income (-.24)
- Voting rates for citizens (-.14)
- Users of illicit drugs (-.03)

F. California's Demography

California's dynamic demography is well known and has been widely reported. This changing demographic structure has profound implications for higher education and the state's economy. The following table is taken from the recent report projecting high school graduates by state prepared by the Western Interstate Commission for Higher Education.

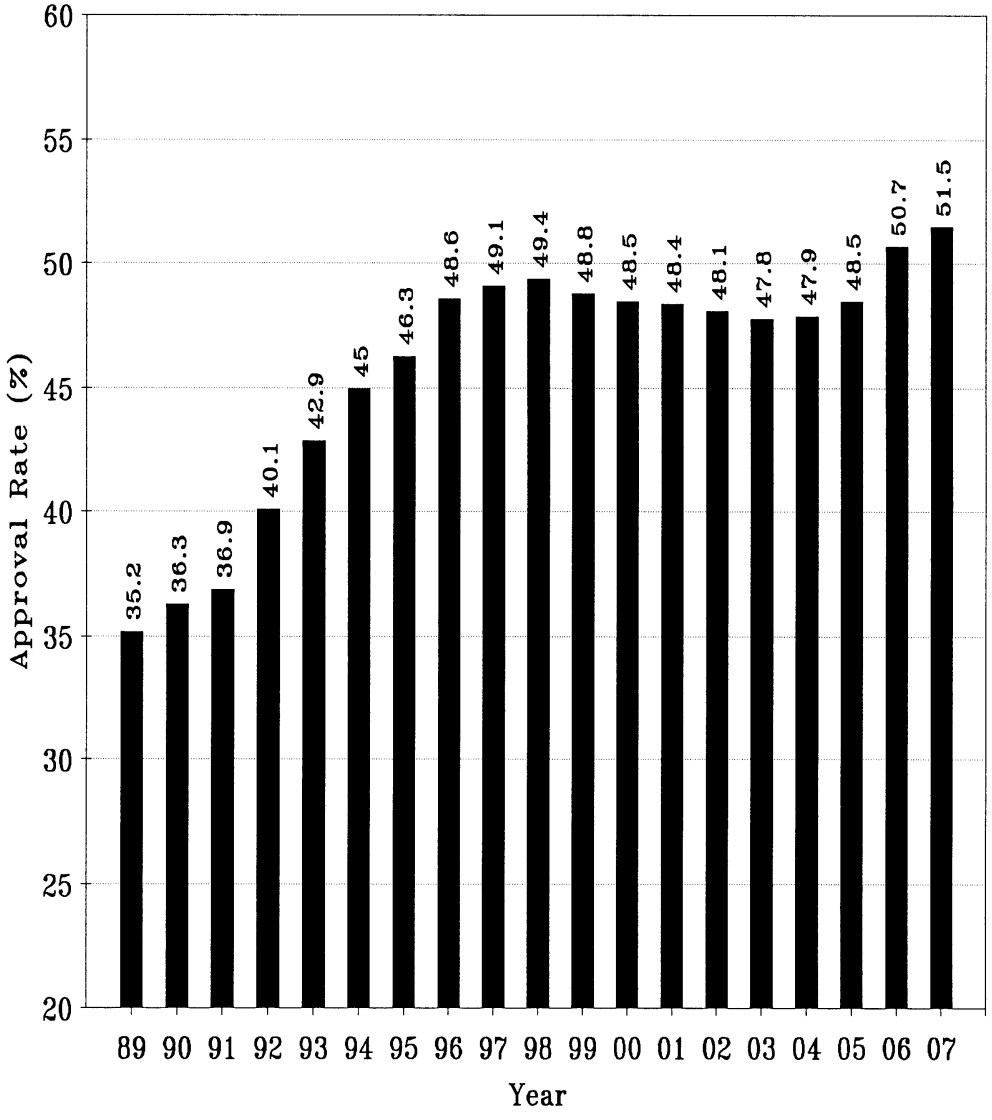
The white plus Asian (higher income) share of the total number of high school graduates compared to the black plus Hispanic plus Indian (lower income) shares that were 65/35 in 1992 became 55/45 by 2005. By 2022 this ratio will be 43/57.

This growth in the low income share of future college students in California is also foretold by the share of K-12 student enrollments approved for subsidized school lunches under the National School Lunch Program. Eligibility for subsidized school lunches is limited to children from families with incomes below 185% of poverty. For California this share has grown from 35.2% in 1989 to 51.5% by 2007. California is now a majority low family income school children state, one of only 13 states with a majority of K-12 student enrollment approved for subsidized school lunches. The success in higher education of this rapidly growing low income share of California's future workforce will largely determine California's future position, competitiveness and prosperity in the global Human Capital Economy.[11]

Public and Nonpublic High School Graduates in California: 1991-92 through 2004-05 (Actual), 2005-06 through 2021-22 (Projected)

	Public Graduates by Race/Ethnicity								
	TOTAL	American Indian/Alaska Native	Asian/ Pacific Islander	Black Non-Hispanic	Hispanic	White Non-Hispanic	Public Total	Non-Public Total	Public & Non-Public Total
1991-92	244,594	2,112	34,921	17,656	66,199	123,706	244,594	23,366	267,960
1992-93	249,320	2,138	36,644	18,219	71,466	120,853	249,320	23,481	272,801
1993-94	253,083	2,119	38,379	18,979	75,026	118,580	253,083	24,301	277,384
1994-95	255,200	2,262	37,029	18,864	76,557	120,488	255,200	25,152	280,352
1995-96	259,071	2,290	37,434	19,436	78,619	121,292	259,071	26,998	286,069
1996-97	269,071	2,364	39,454	20,742	82,015	124,496	269,071	27,210	296,281
1997-98	282,536	2,513	42,711	21,165	87,742	128,405	282,897	28,835	311,732
1998-99	298,428	2,665	44,031	22,065	95,438	134,229	299,221	28,688	327,909
1999-00	308,905	2,655	45,499	22,536	100,637	137,578	309,866	30,596	340,462
2000-01	315,189	2,734	46,958	22,474	103,795	139,228	315,189	30,285	345,474
2001-02	324,152	3,036	48,206	23,451	109,038	140,421	325,895	31,116	357,011
2002-03	338,091	3,120	48,728	24,855	116,724	144,664	341,097	31,946	373,043
2003-04	340,069	3,040	48,770	25,267	121,418	141,574	343,480	32,459	375,939
2004-05	350,452	2,950	50,224	26,800	129,671	140,807	355,217	32,474	387,691
2005-06	*364,415*	*3,115*	*53,162*	*27,600*	*138,766*	*141,771*	*370,697*	*33,807*	*404,504*
2006-07	*367,824*	*3,195*	*53,347*	*28,183*	*142,549*	*140,550*	*376,385*	*34,159*	*410,544*
2007-08	*377,272*	*3,269*	*53,996*	*28,785*	*150,546*	*140,677*	*388,697*	*34,918*	*423,615*
2008-09	*374,991*	*3,098*	*54,669*	*28,470*	*155,389*	*133,365*	*387,759*	*34,346*	*422,105*
2009-10	*372,654*	*2,946*	*55,543*	*27,043*	*159,780*	*127,342*	*385,728*	*33,910*	*419,638*
2010-11	*372,038*	*2,807*	*56,242*	*26,858*	*165,378*	*120,754*	*386,595*	*32,885*	*419,481*
2011-12	*371,137*	*2,868*	*56,789*	*26,695*	*168,271*	*116,513*	*386,844*	*32,339*	*419,183*
2012-13	*365,777*	*2,867*	*57,235*	*25,202*	*167,768*	*112,705*	*382,601*	*31,354*	*413,955*
2013-14	*358,601*	*2,796*	*57,469*	*23,915*	*167,273*	*107,148*	*376,210*	*30,035*	*406,245*
2014-15	*351,808*	*2,583*	*57,640*	*23,087*	*166,765*	*101,734*	*370,492*	*28,995*	*399,487*
2015-16	*346,703*	*2,570*	*56,493*	*22,616*	*166,249*	*98,774*	*367,479*	*28,181*	*395,660*
2016-17	*345,085*	*2,489*	*57,346*	*22,070*	*167,545*	*95,636*	*367,262*	*27,076*	*394,337*
2017-18	*356,870*	*2,287*	*63,514*	*21,701*	*172,260*	*97,108*	*374,228*	*28,844*	*403,072*
2018-19	*354,311*	*2,255*	*62,185*	*20,854*	*174,209*	*94,808*	*371,446*	*28,661*	*400,107*
2019-20	*356,491*	*2,256*	*64,542*	*20,165*	*175,965*	*93,564*	*373,120*	*28,640*	*401,760*
2020-21	*364,354*	*2,218*	*66,698*	*19,868*	*180,479*	*95,090*	*381,378*	*29,142*	*410,520*
2021-22	*362,658*	*2,290*	*66,549*	*19,454*	*184,108*	*90,258*	*378,635*	*28,880*	*407,514*

National School Lunch Approval Rate for California School Children 1989 to 2007



Source: Dept. of Agriculture