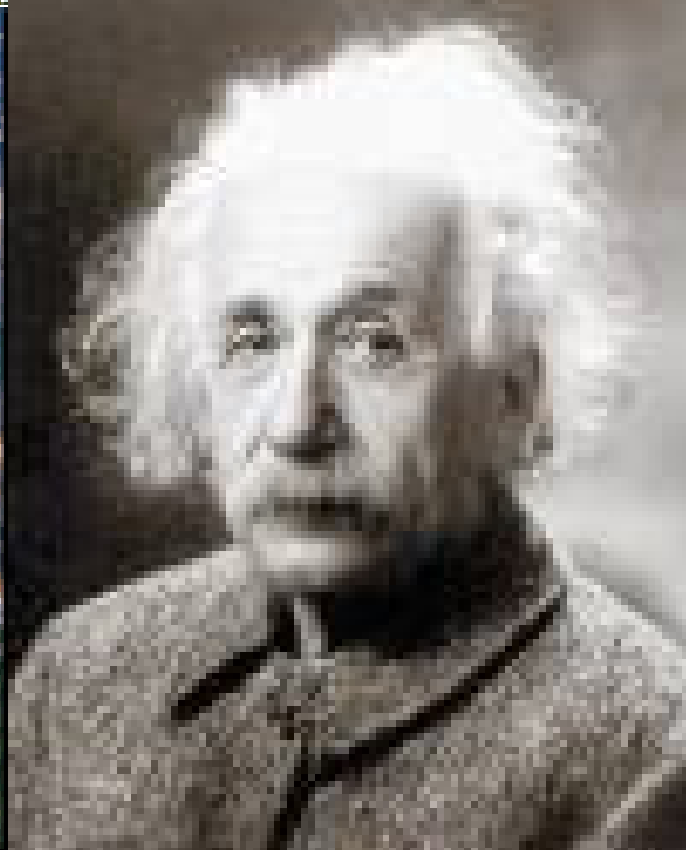


Competitiveness & the Dynamics of Economic Change.

Will California be a Leader in the Newly Sprouted Knowledge Economy?

Bruce Yandle
yandle@clemson.edu



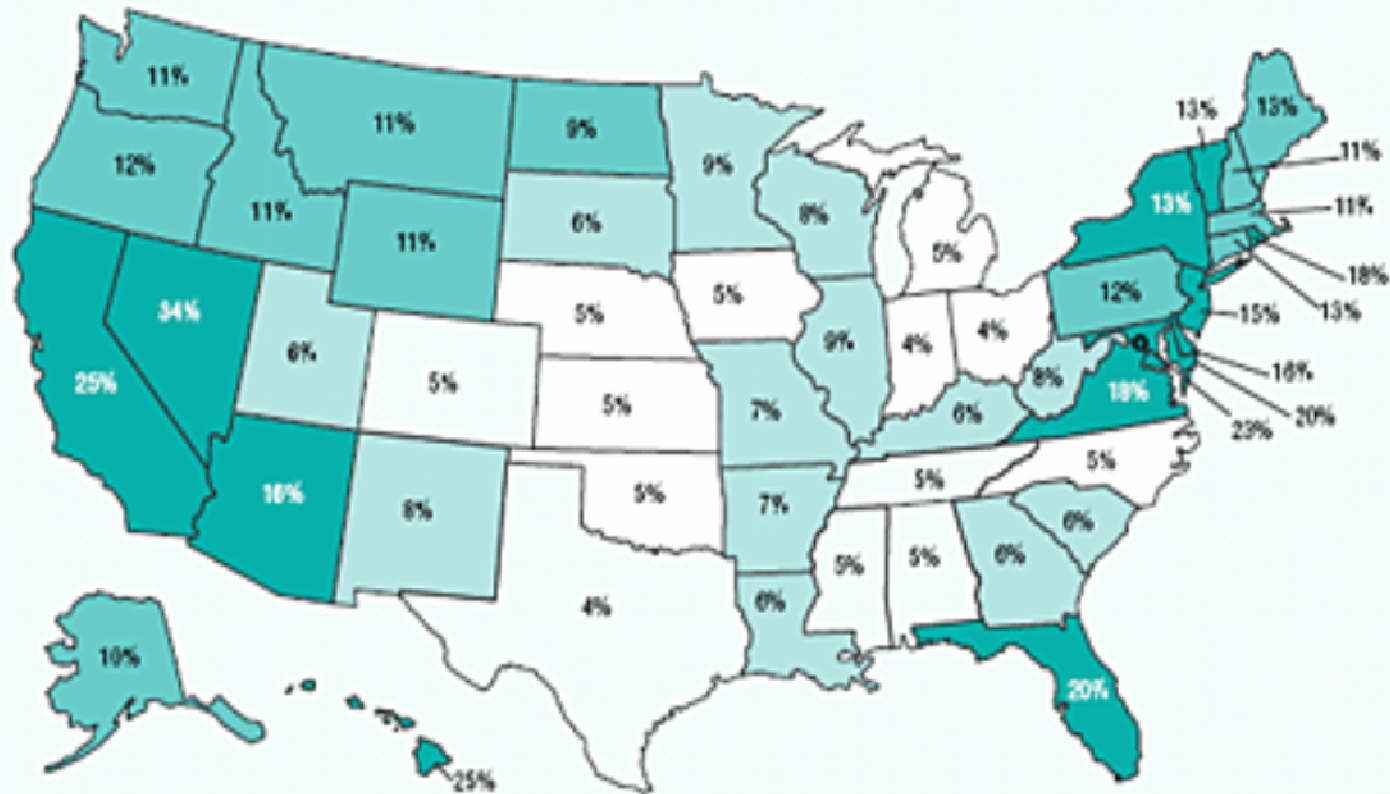


How Great Thou Art



Wait a minute: What about
the Sub-Prime mess?

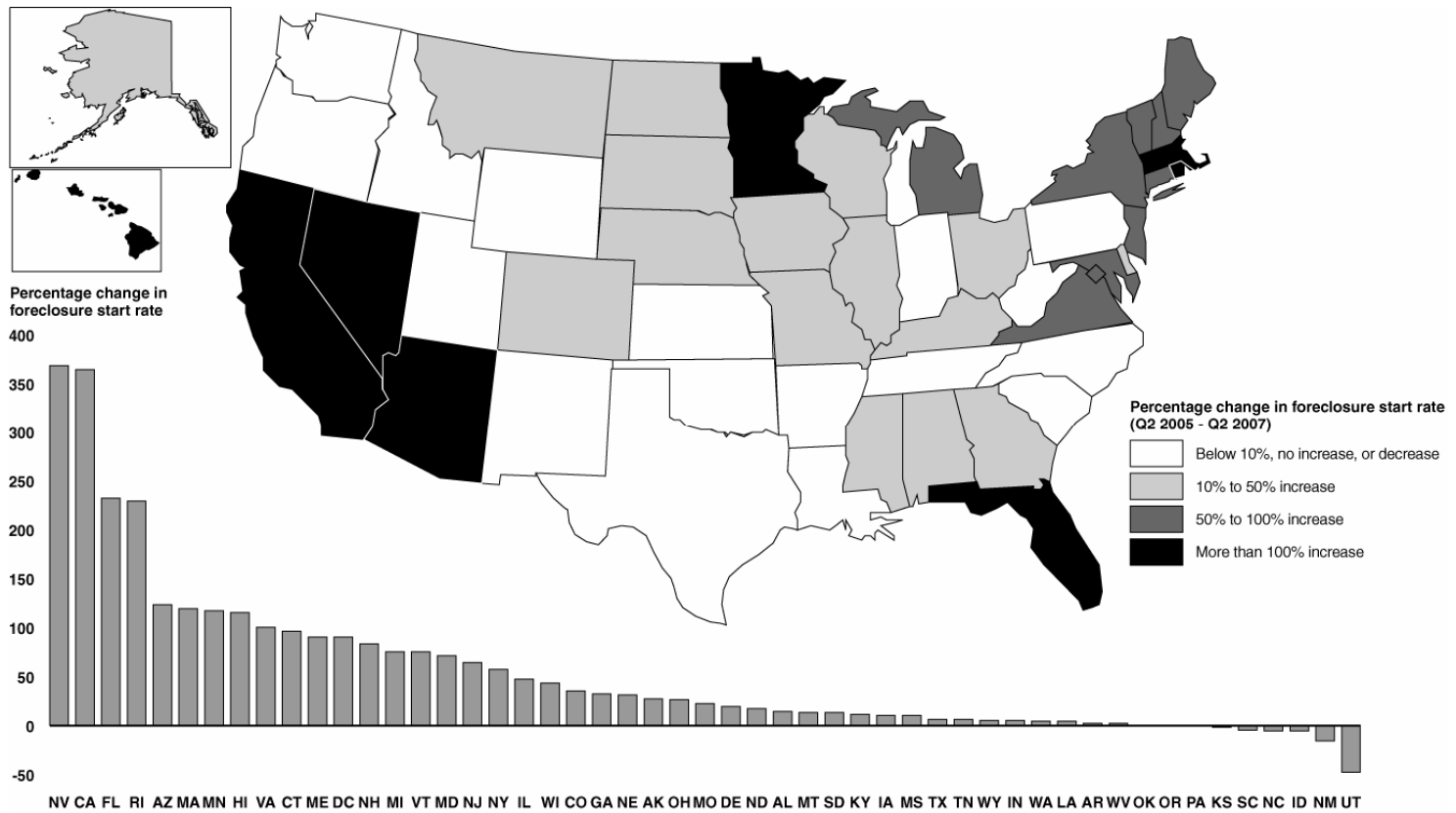
House Price Appreciation, 2004



NOTE: Darker color indicates greater percent appreciation.

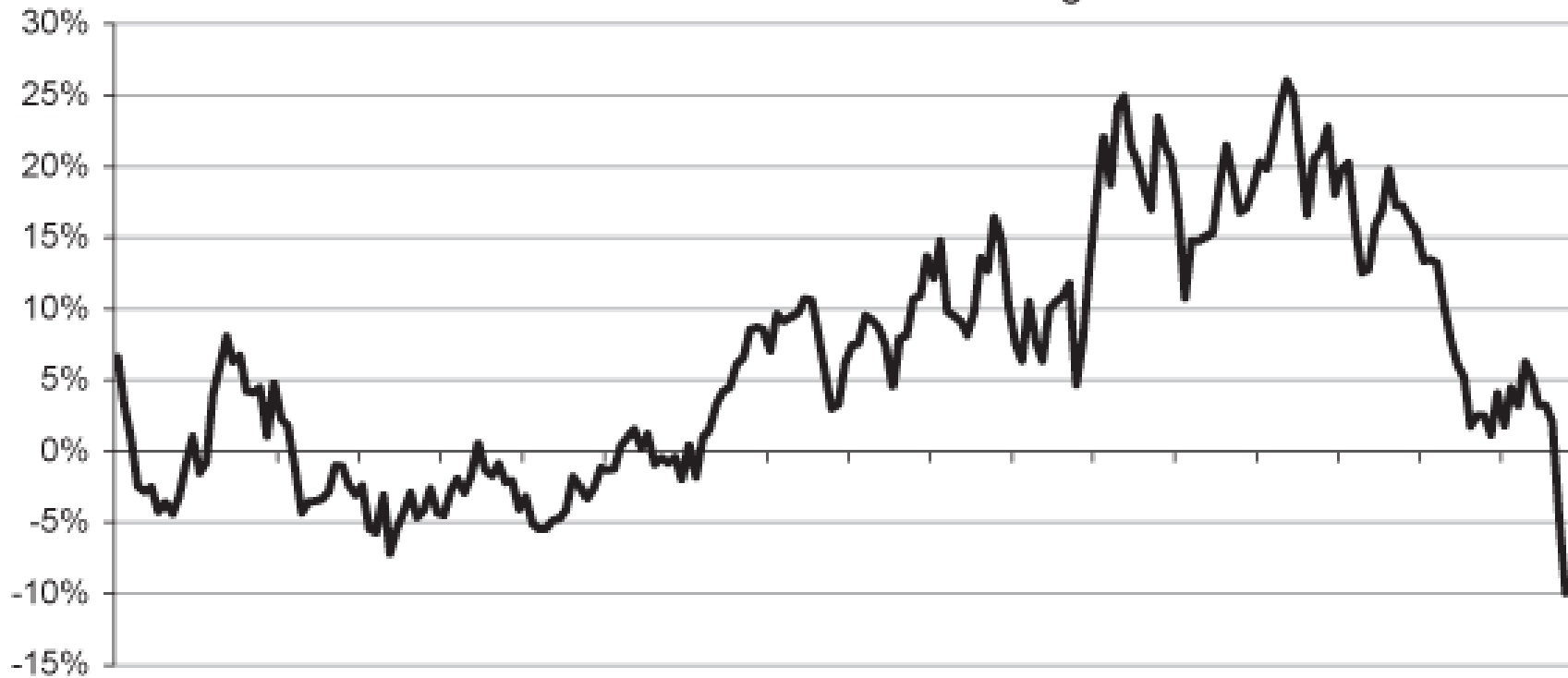
SOURCE: Office of Federal Housing Enterprise Oversight, *House Price Index*.

Default and Foreclosure Trends



Sources: GAO analysis of MBA data; Art Explosion (map).

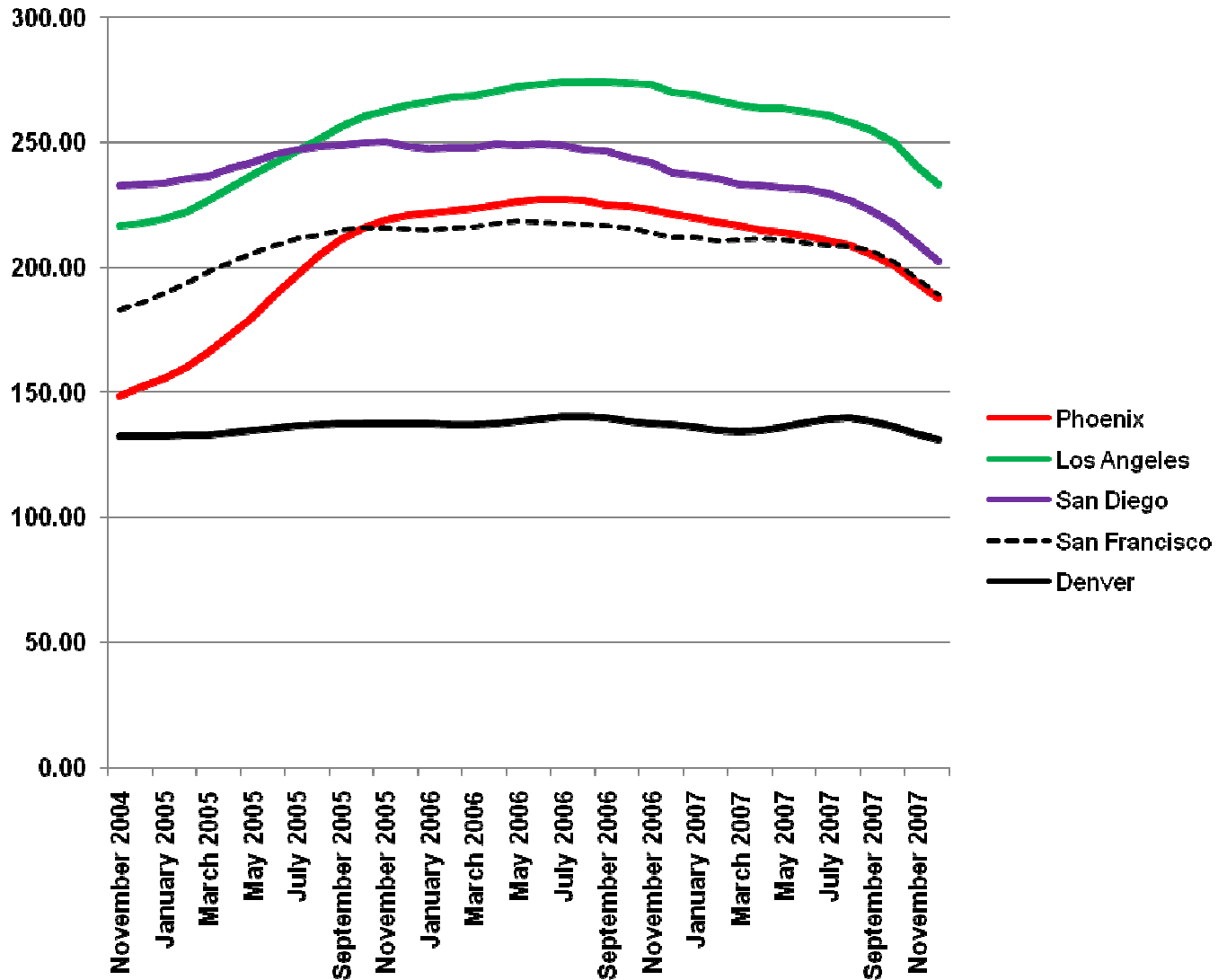
California Median Price of Existing Single-Family Homes Year-Over-Year Percent Change



Source: California Association of Realtors

Jan-90 Jan-91 Jan-92 Jan-93 Jan-94 Jan-95 Jan-96 Jan-97 Jan-98 Jan-99 Jan-00 Jan-01 Jan-02 Jan-03 Jan-04 Jan-05 Jan-06 Jan-07

S&P Shiller Housing Price Index



Thinking about the Challenge

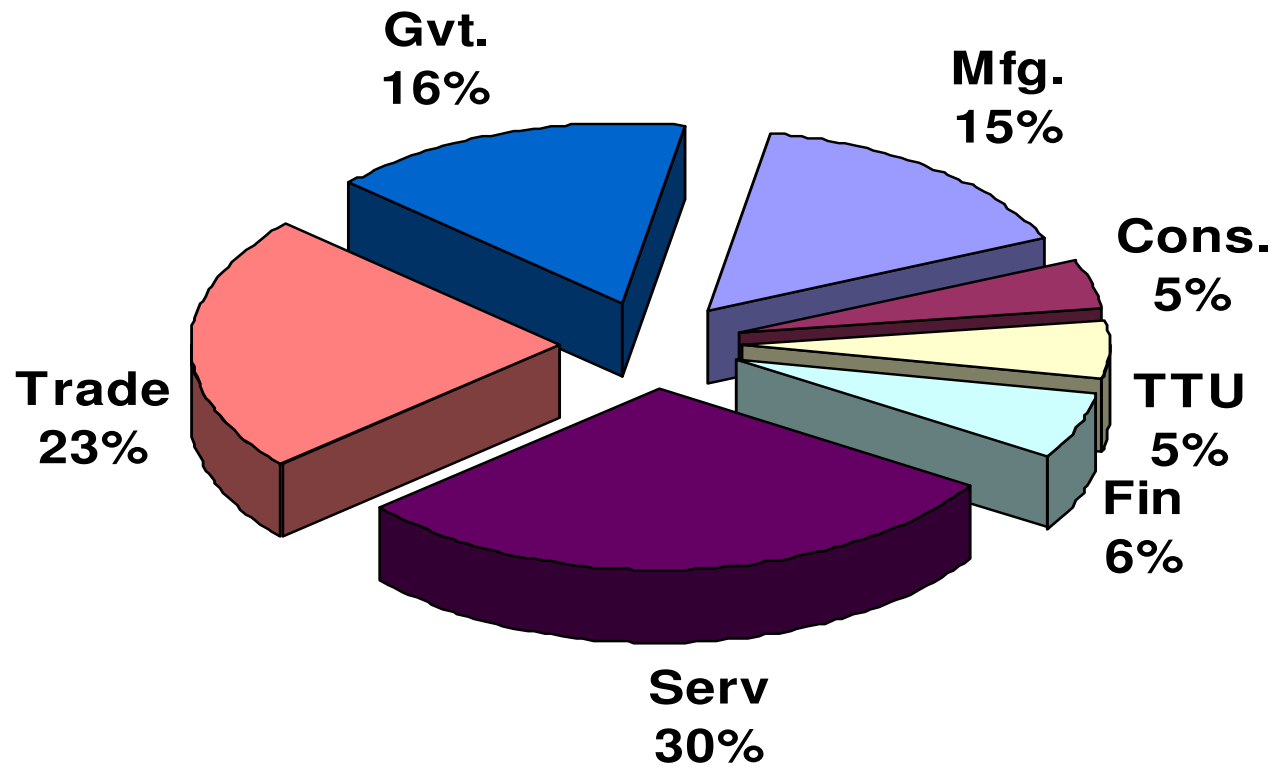
Baseline Considerations

- How does California stack up as a wealth-producing economy? Relative to what?
- What are the strengths and weaknesses?
- What about economic freedom?

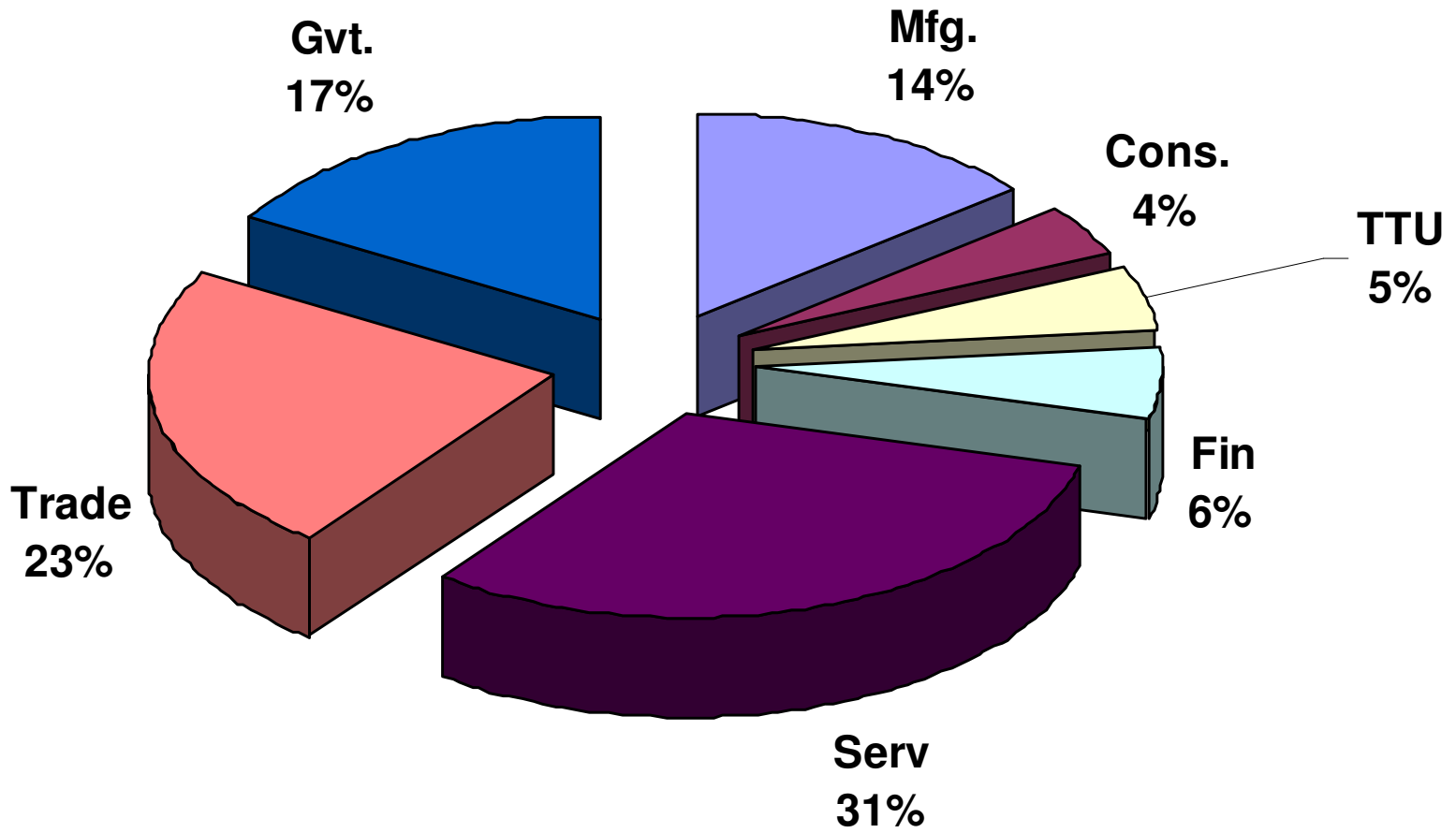
Knowledge Economy

- What is a Knowledge Economy?
- The California Challenge
- Lessons to consider

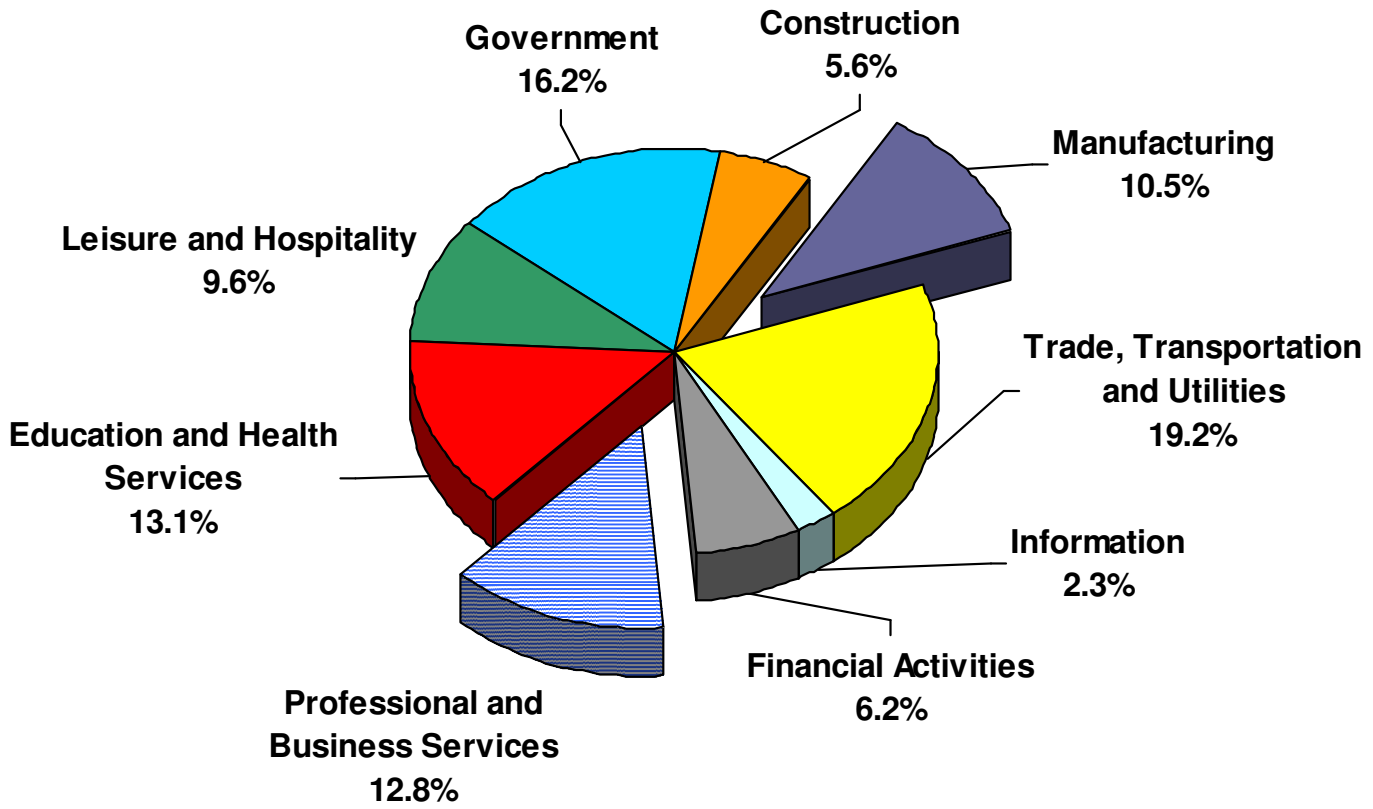
U.S. Employment Sectors: 1997



California Sectors: 1997

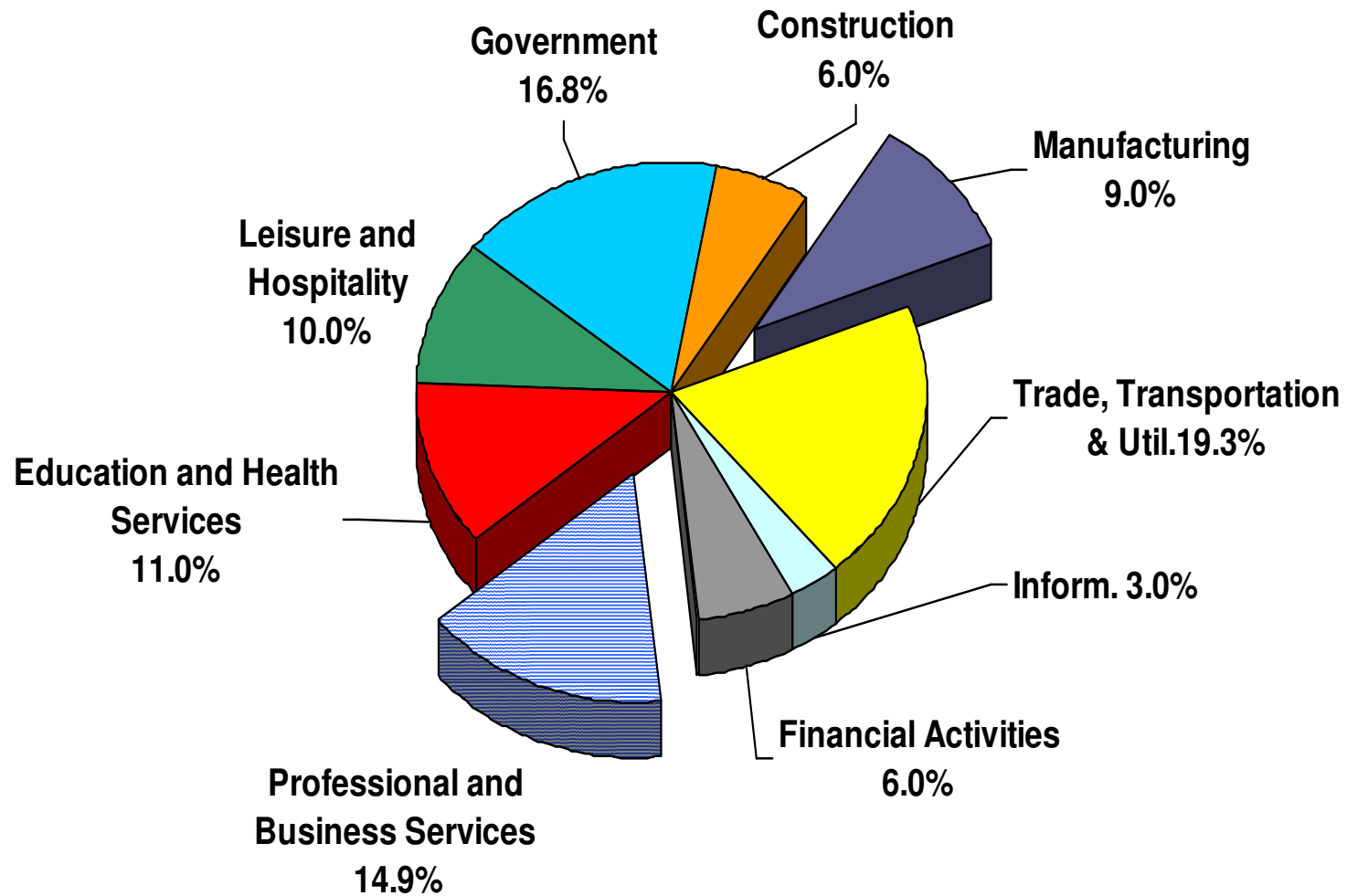


Percent Distribution of US Nonfarm Employment by Industry 2007



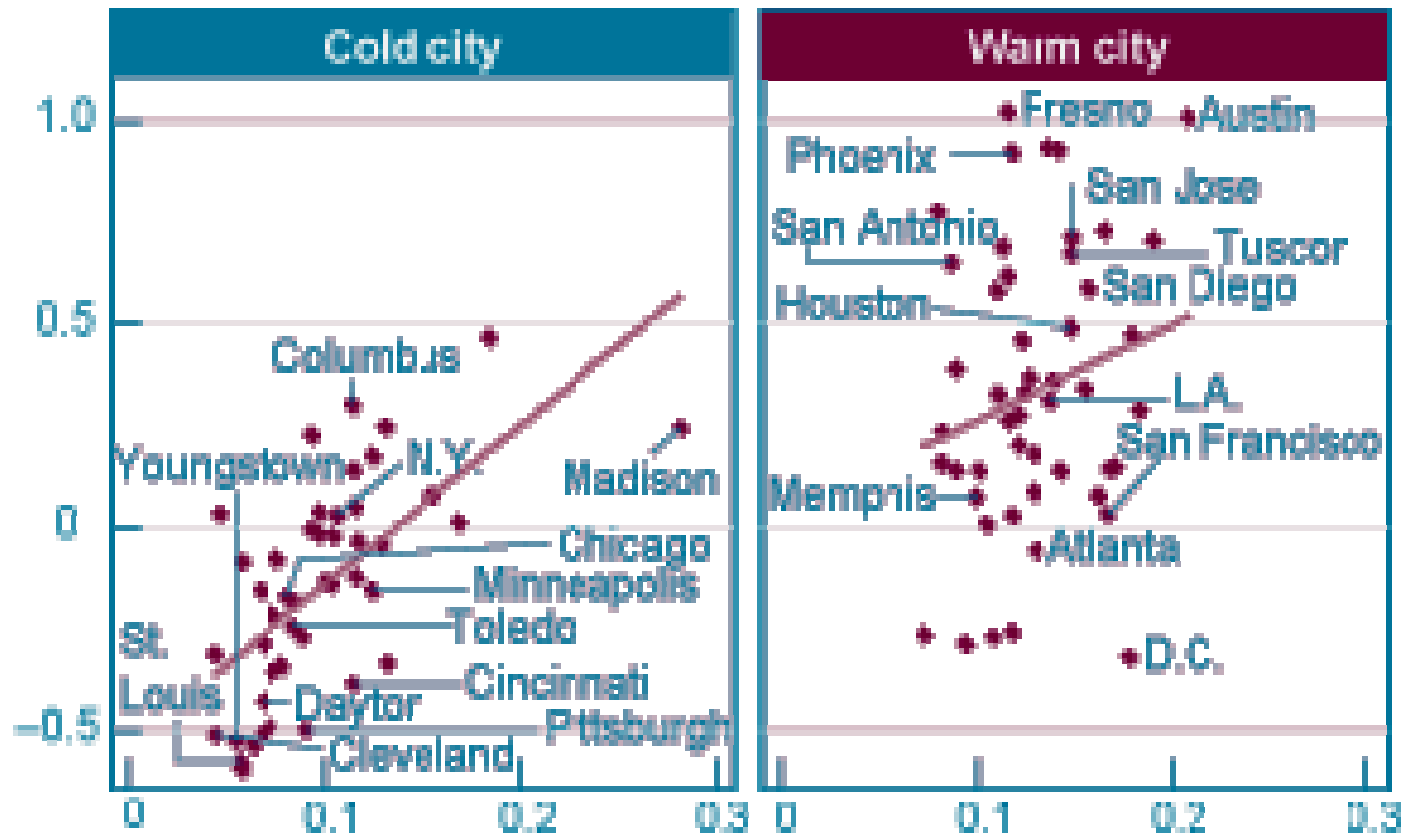
Source: Bureau of Labor Statistics

Percent Distribution of California Nonfarm Employment by Industry 2007



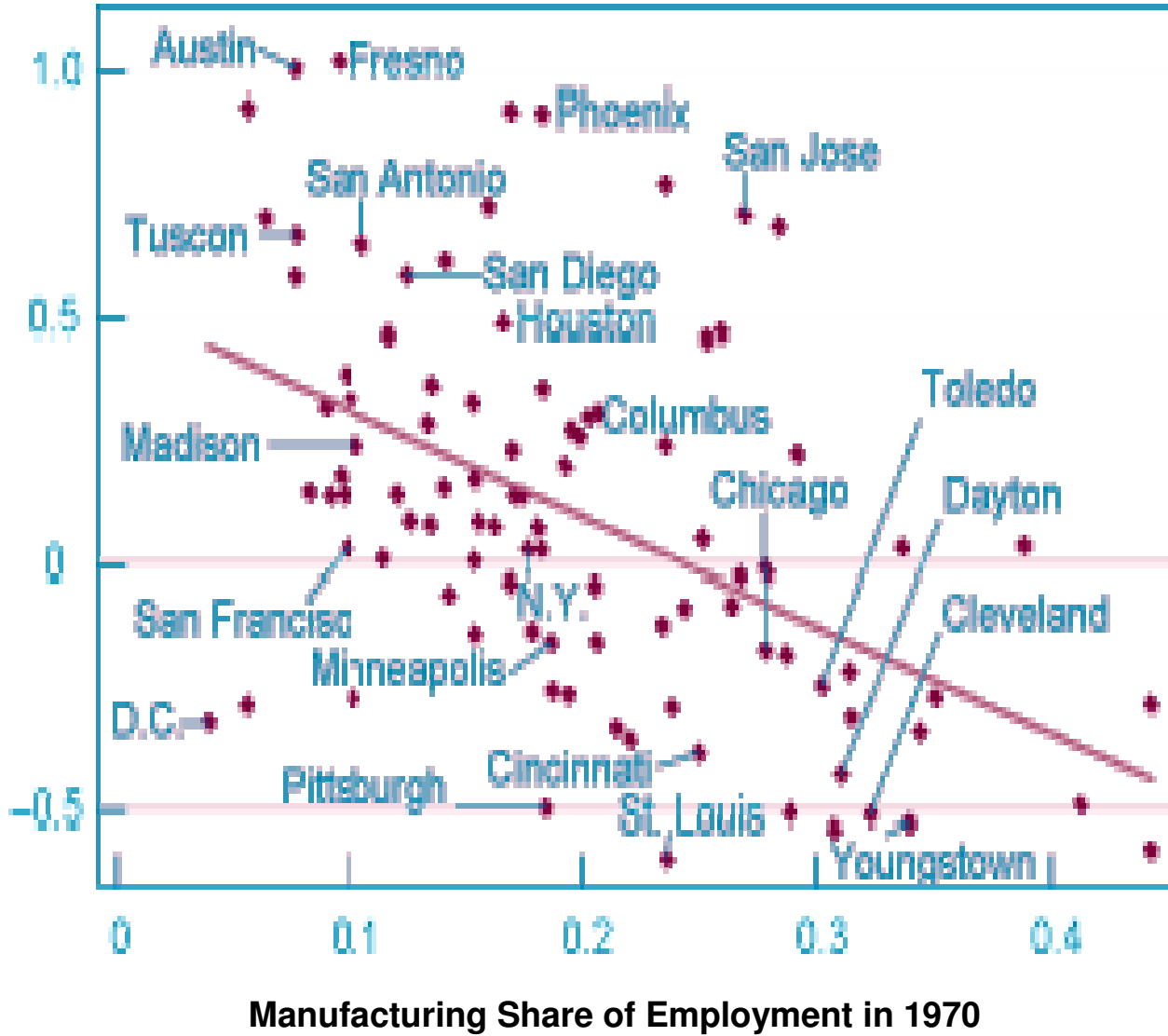
Source: Bureau of Labor Statistics

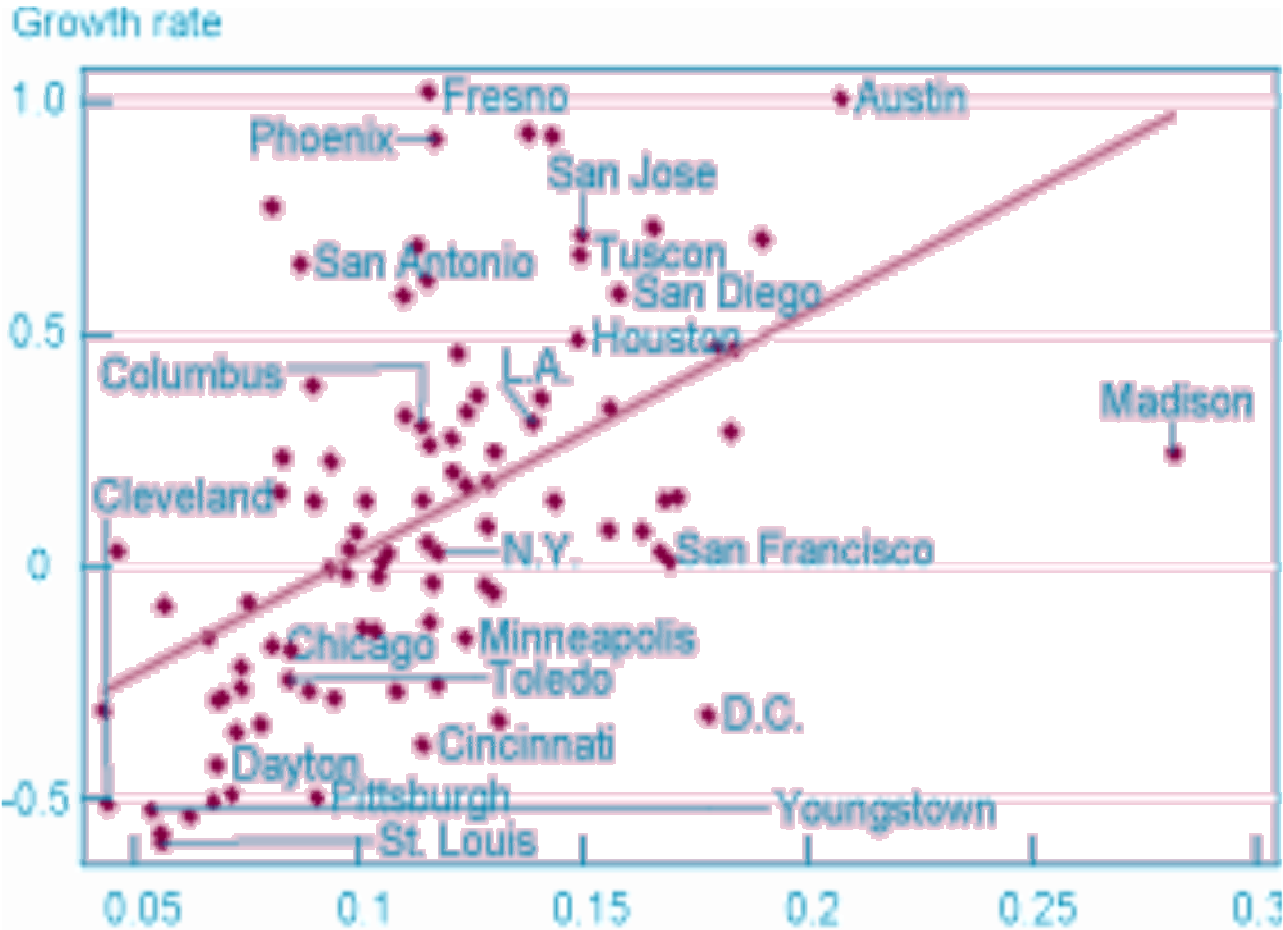
Growth rate



Share of Adult Population with College Degree in 1970

Growth rates

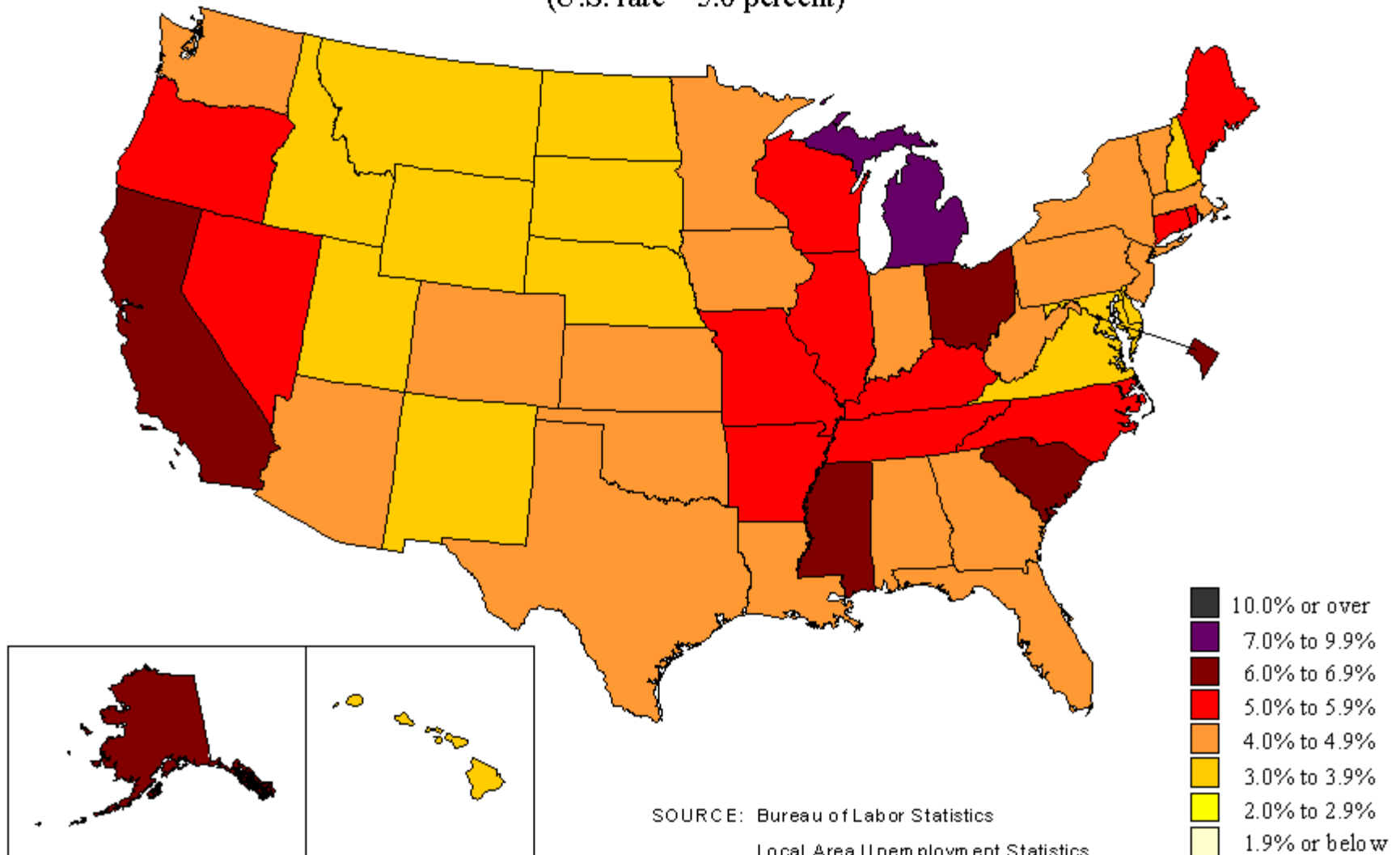




Share of Adult Population with College Degree in 1970

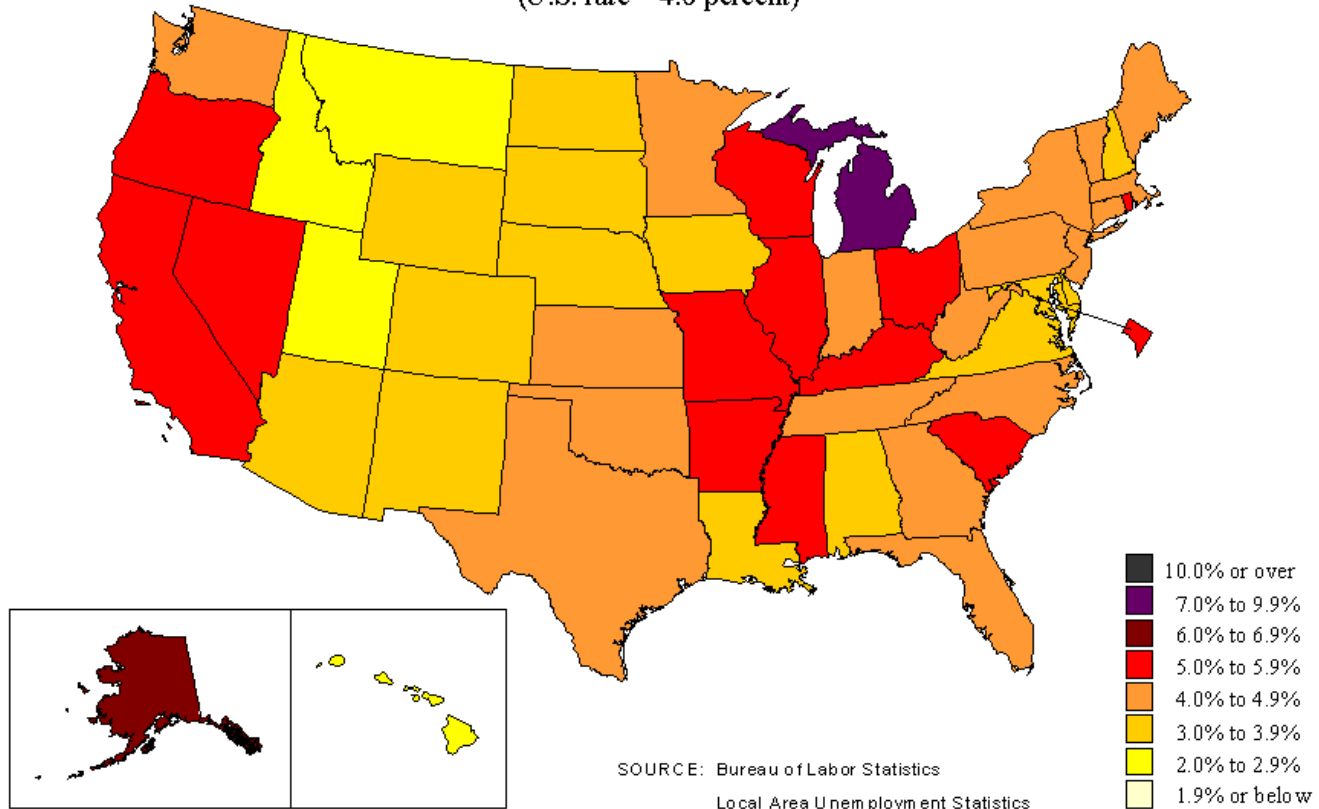
Unemployment rates by state, seasonally adjusted, December 2007

(U.S. rate = 5.0 percent)



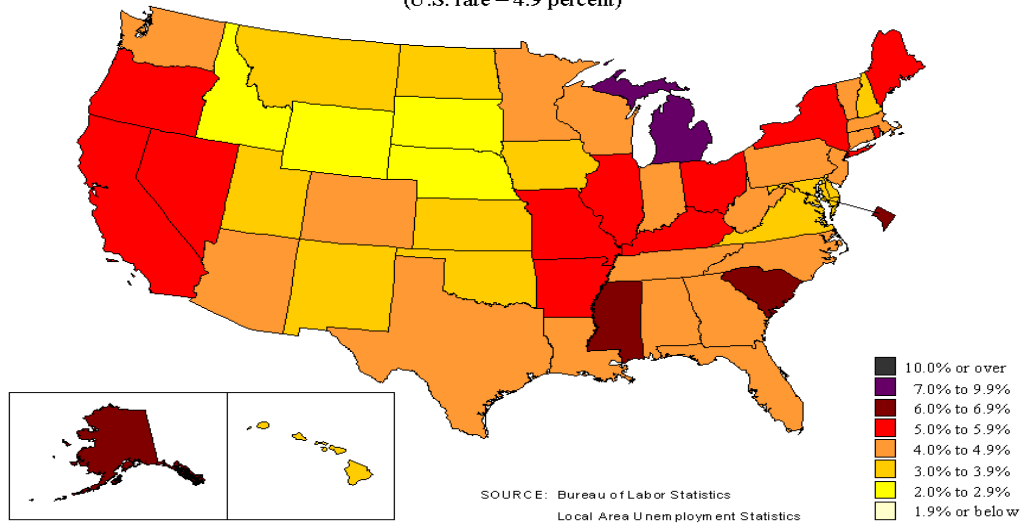
Unemployment rates by state, seasonally adjusted, August 2007

(U.S. rate = 4.6 percent)



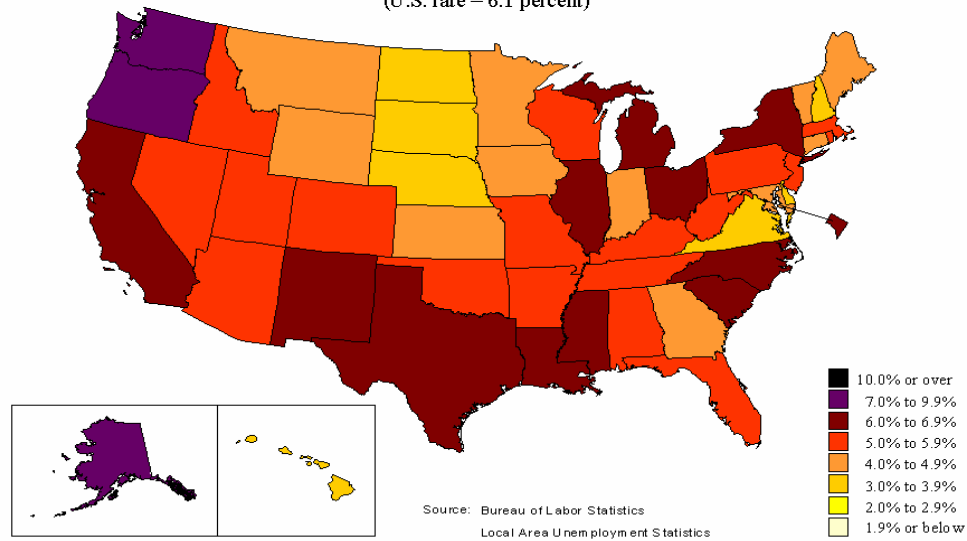
**Unemployment rates by state,
seasonally adjusted, January 2008**

(U.S. rate = 4.9 percent)



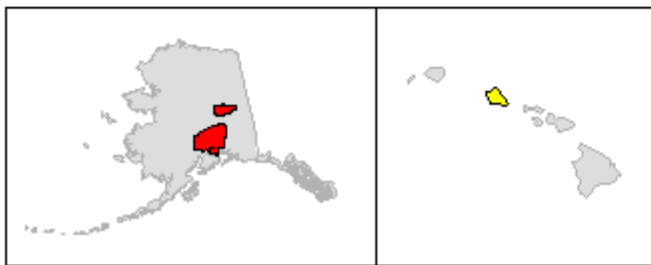
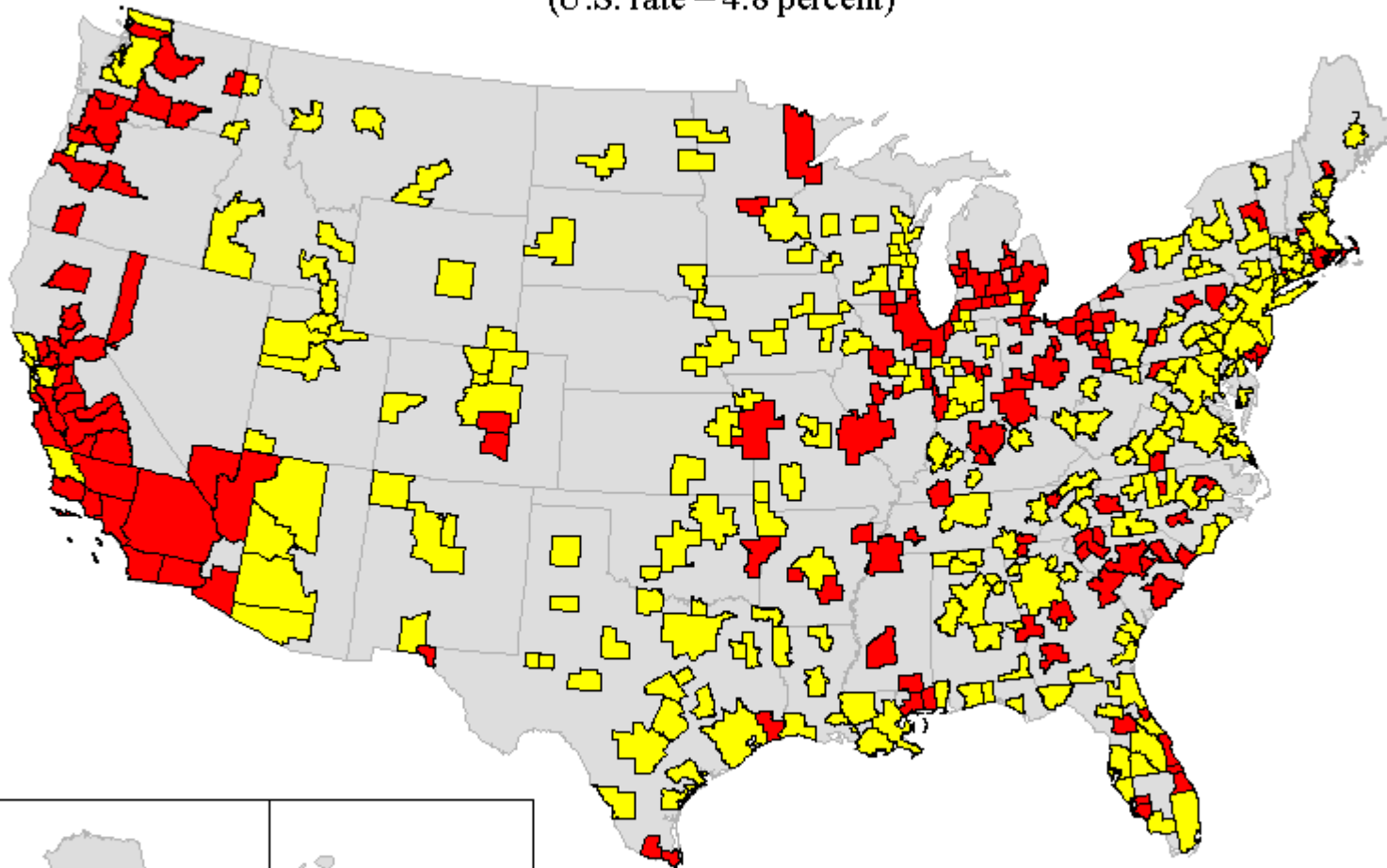
**Unemployment rates by state,
seasonally adjusted, May 2003**

(U.S. rate = 6.1 percent)





Unemployment rates by metropolitan area, not seasonally adjusted, December 2007

(U.S. rate = 4.8 percent)

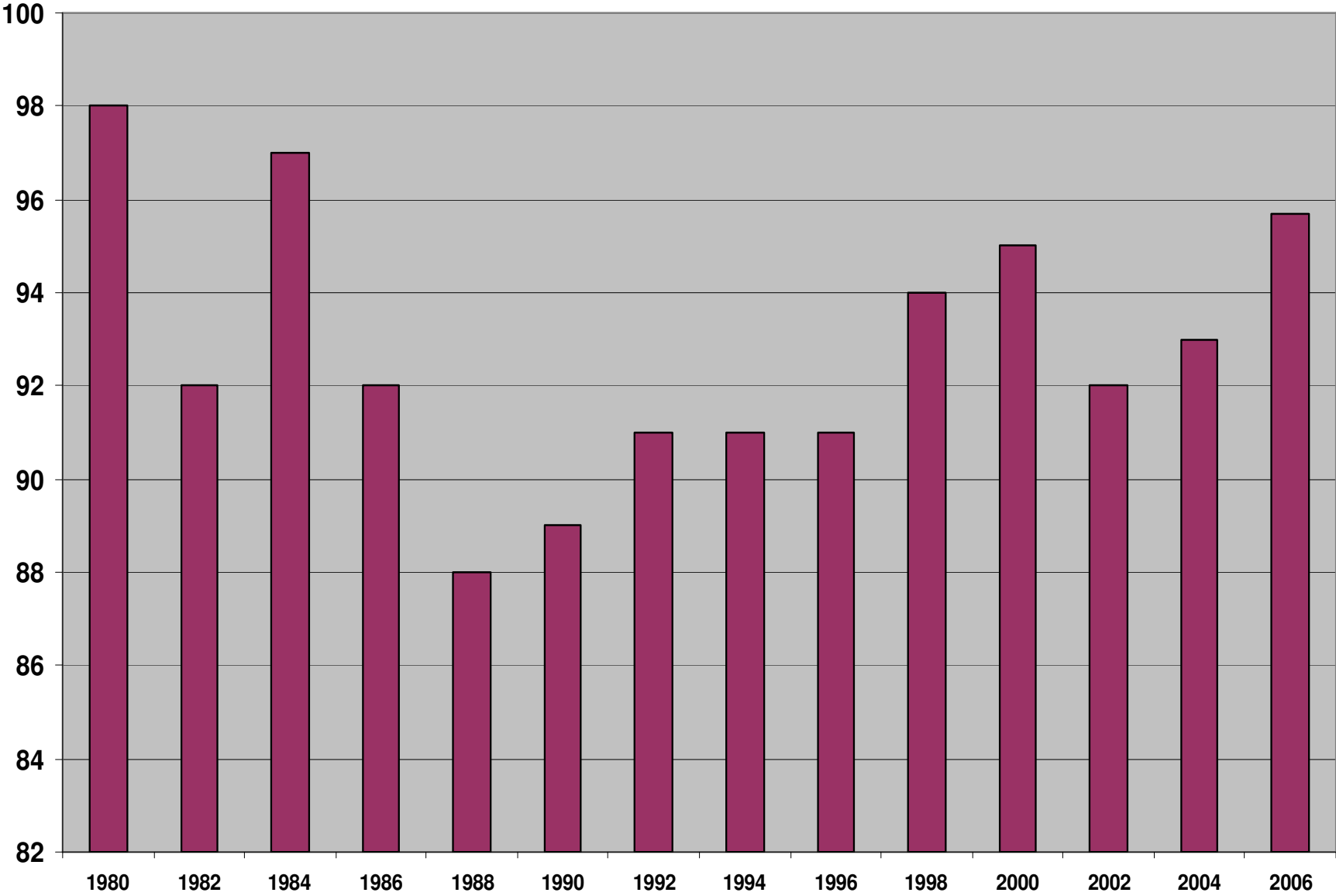


SOURCE: Bureau of Labor Statistics
Local Area Unemployment Statistics

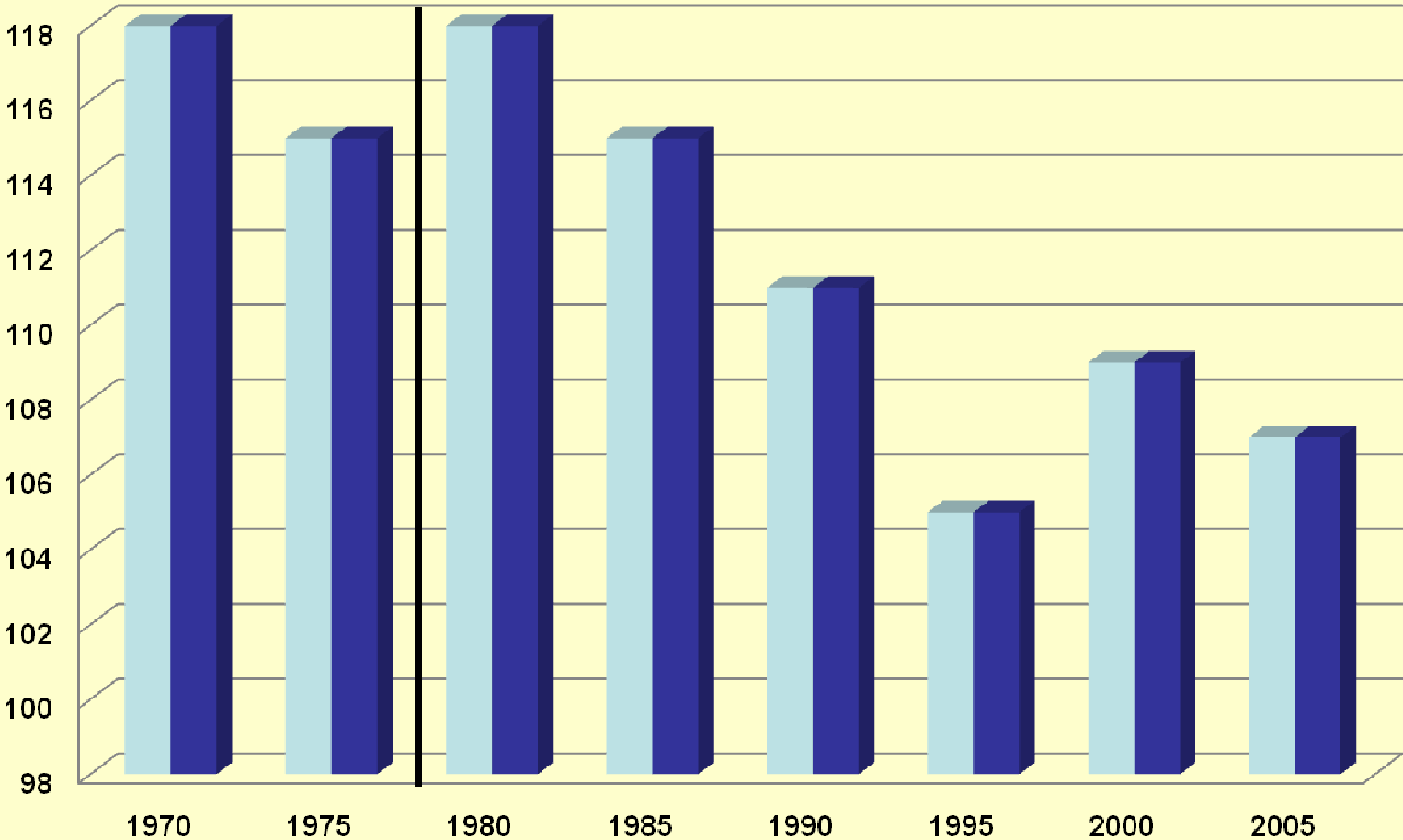
NOTE: Map includes data for 369 metropolitan
areas based on Office of Management
and Budget Bulletin No. 07-01.

 Above U.S. average
 U.S. average or below

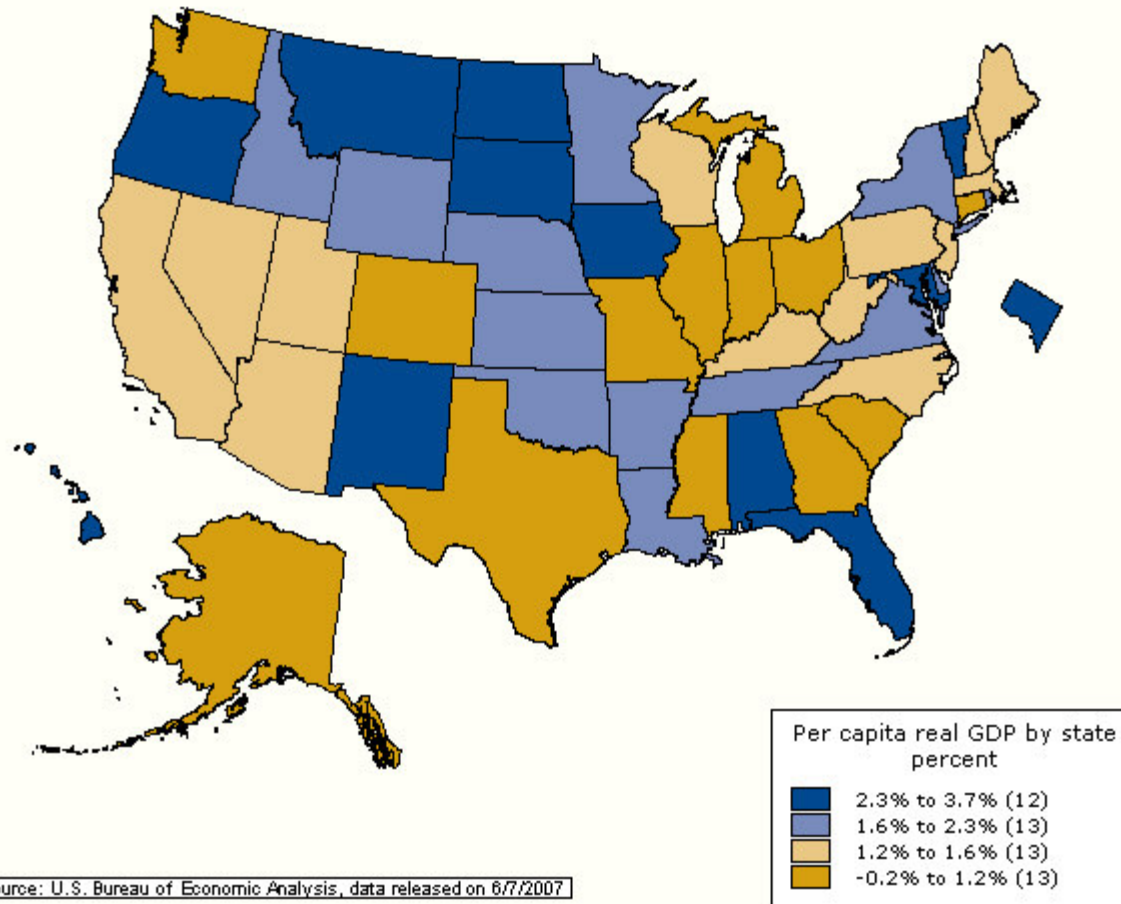
Texas Per Capita Income Per Cent of U.S.



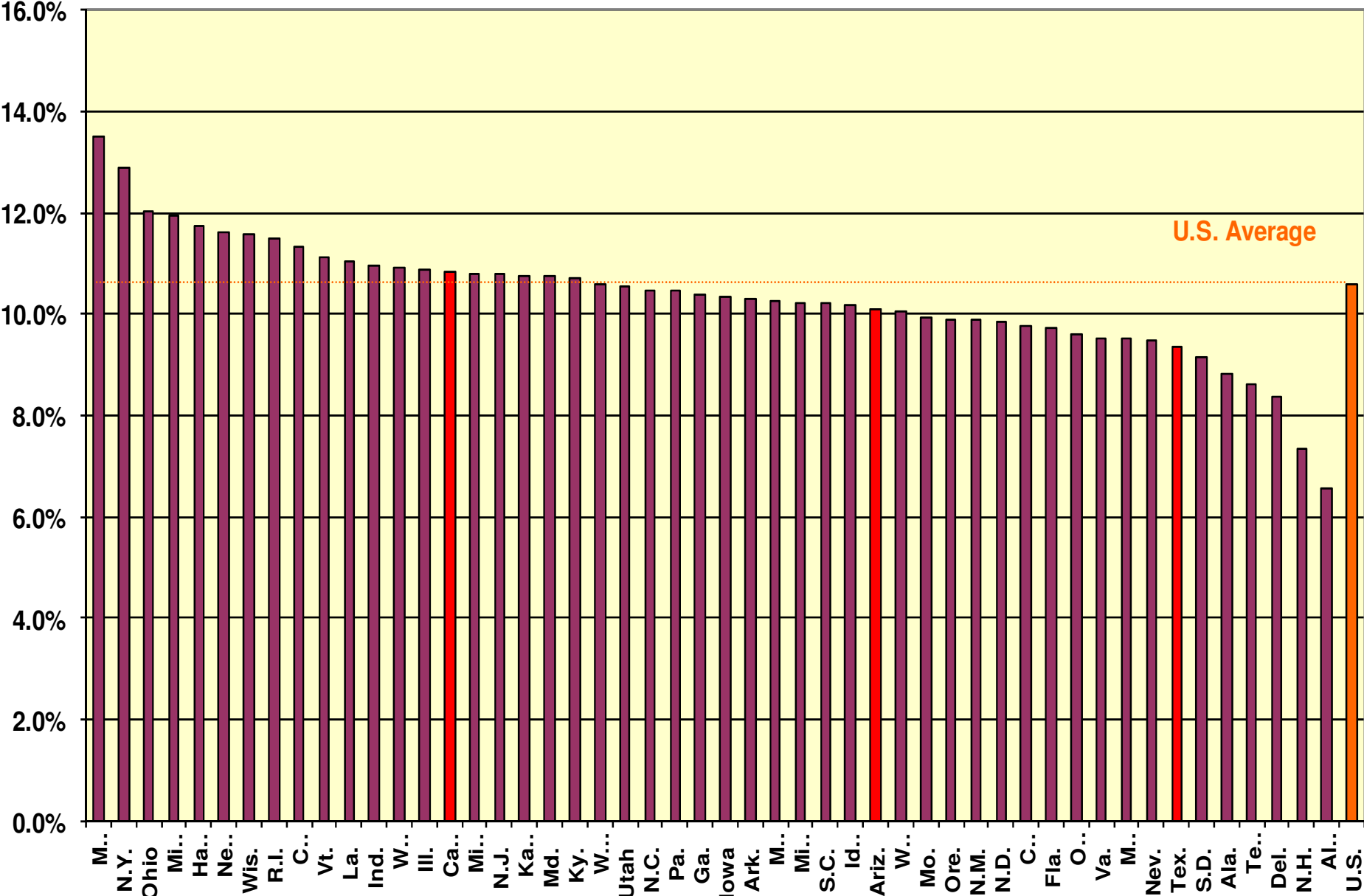
Ratio of California Per Capita Income to U.S. Per Capita Income



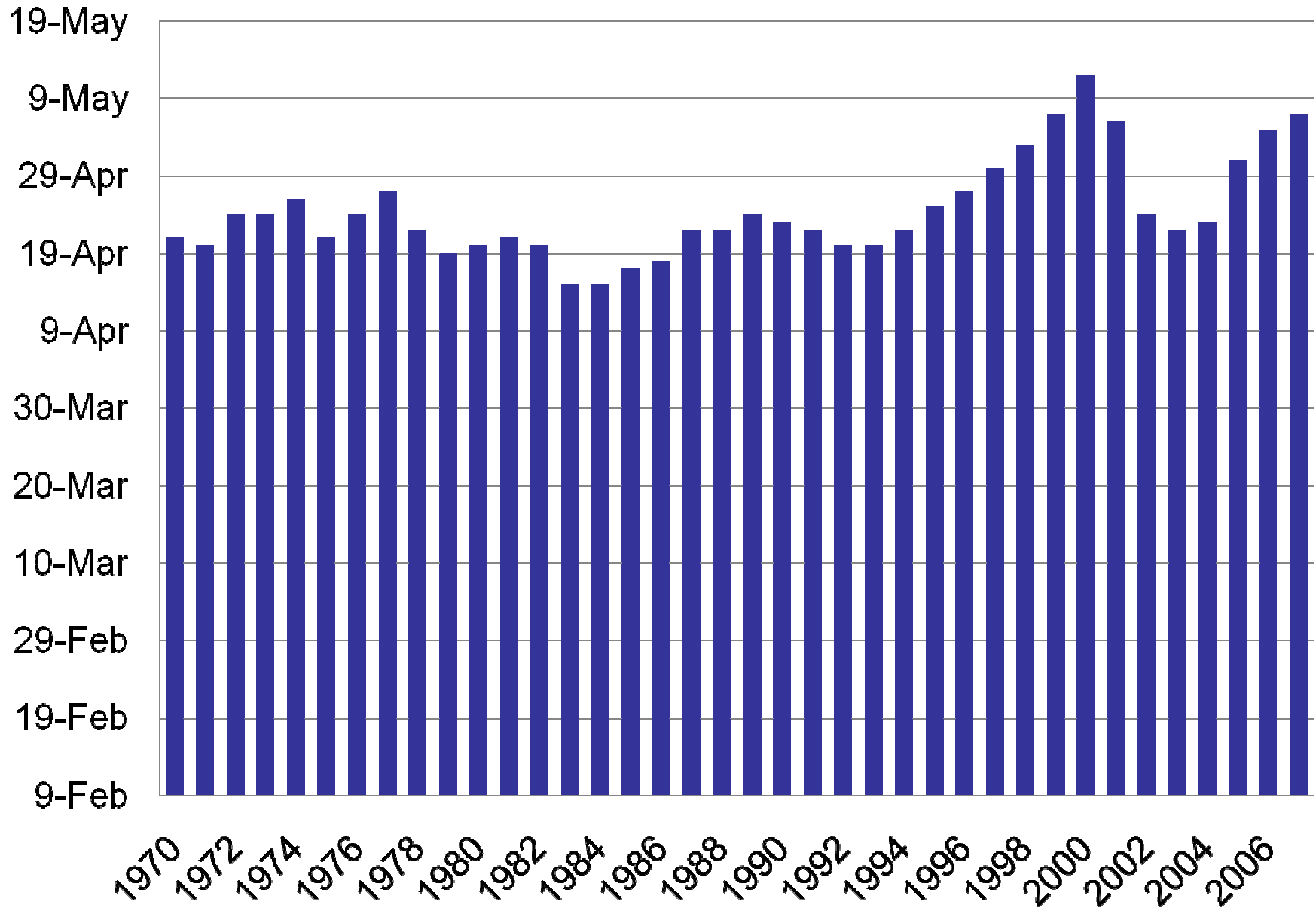
Average Annual Per Capita Real GDP Growth: 2000-2006



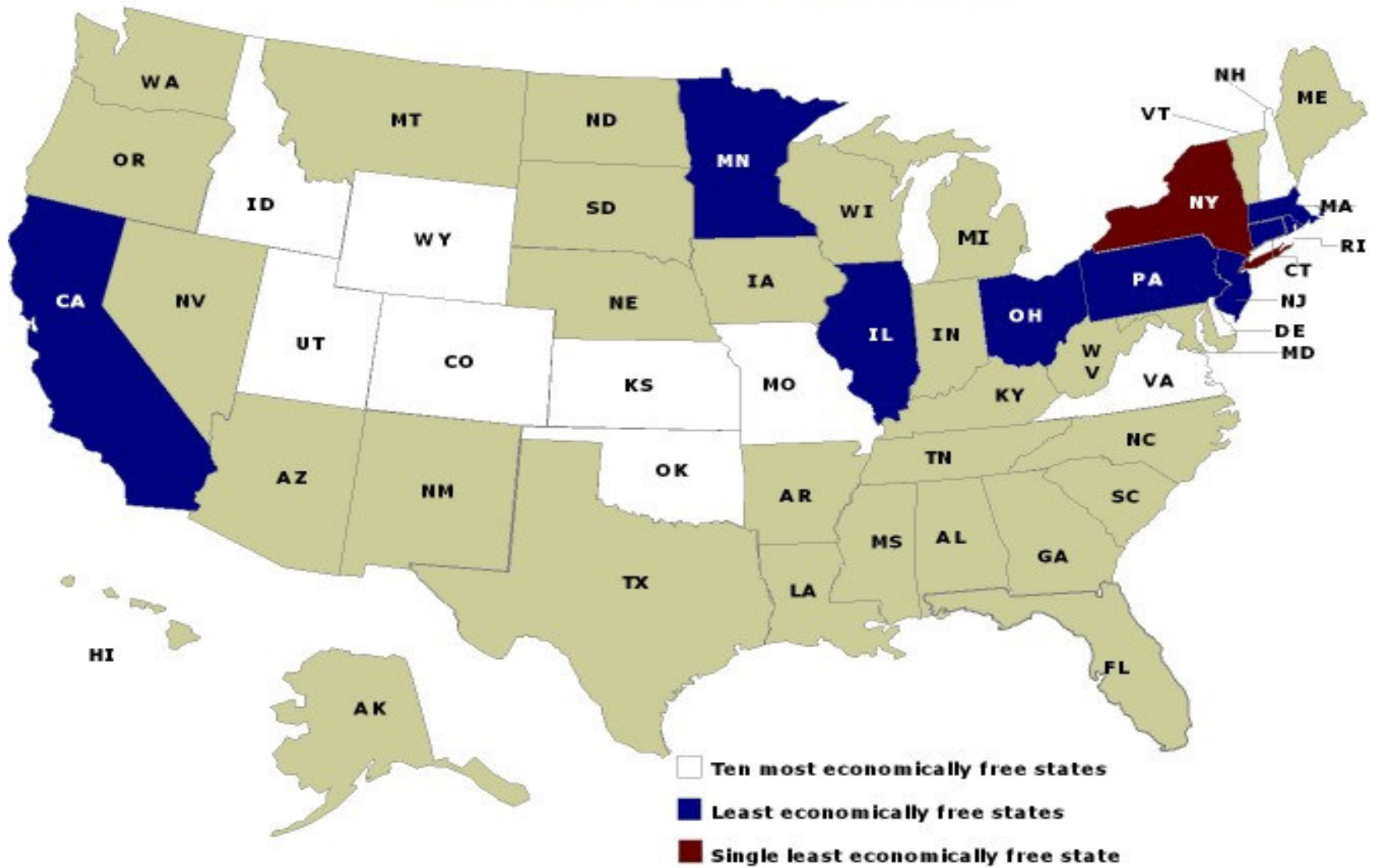
State & Local Tax Burden FY2004



California Tax Freedom Day: 1970-2007



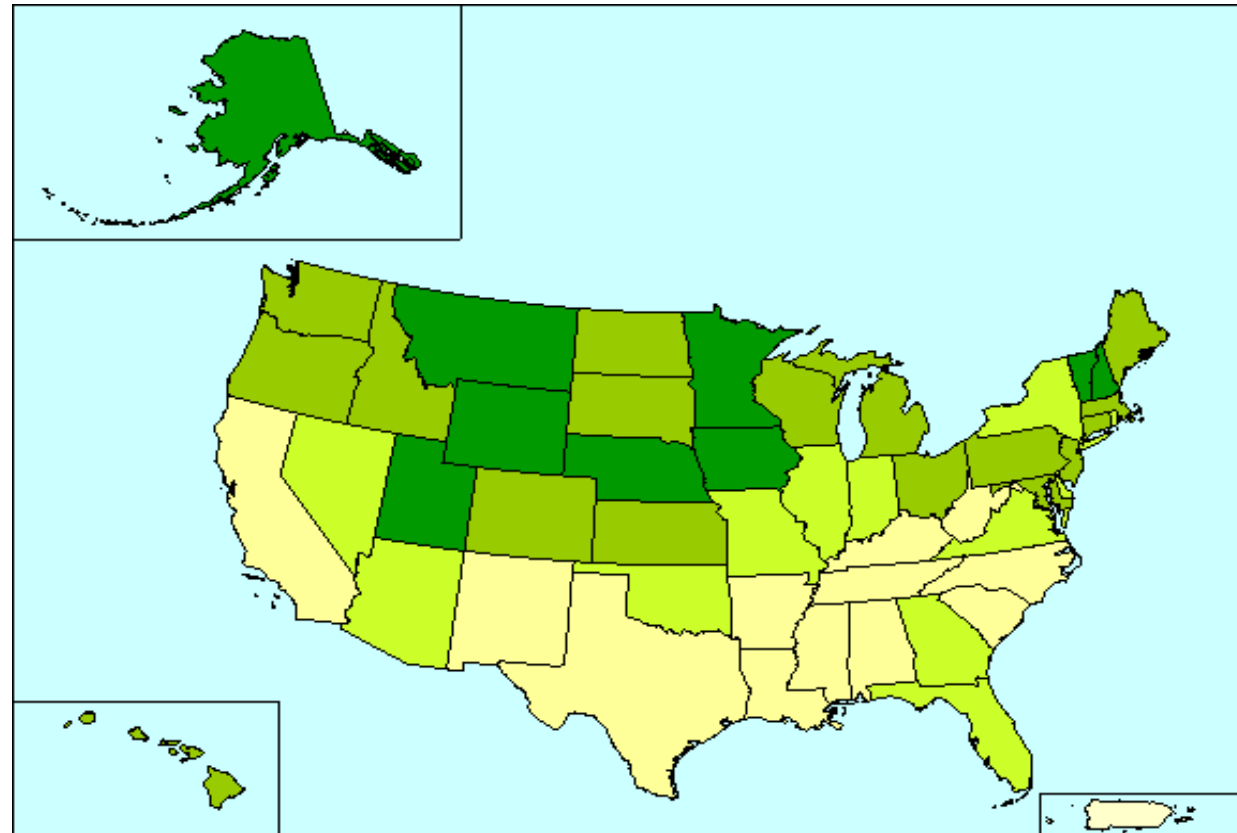
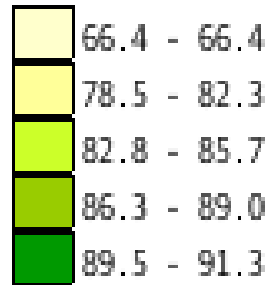
STATE ECONOMIC FREEDOM INDEX: 2004



Map courtesy of the Public Policy Institute, www.ppiny.org

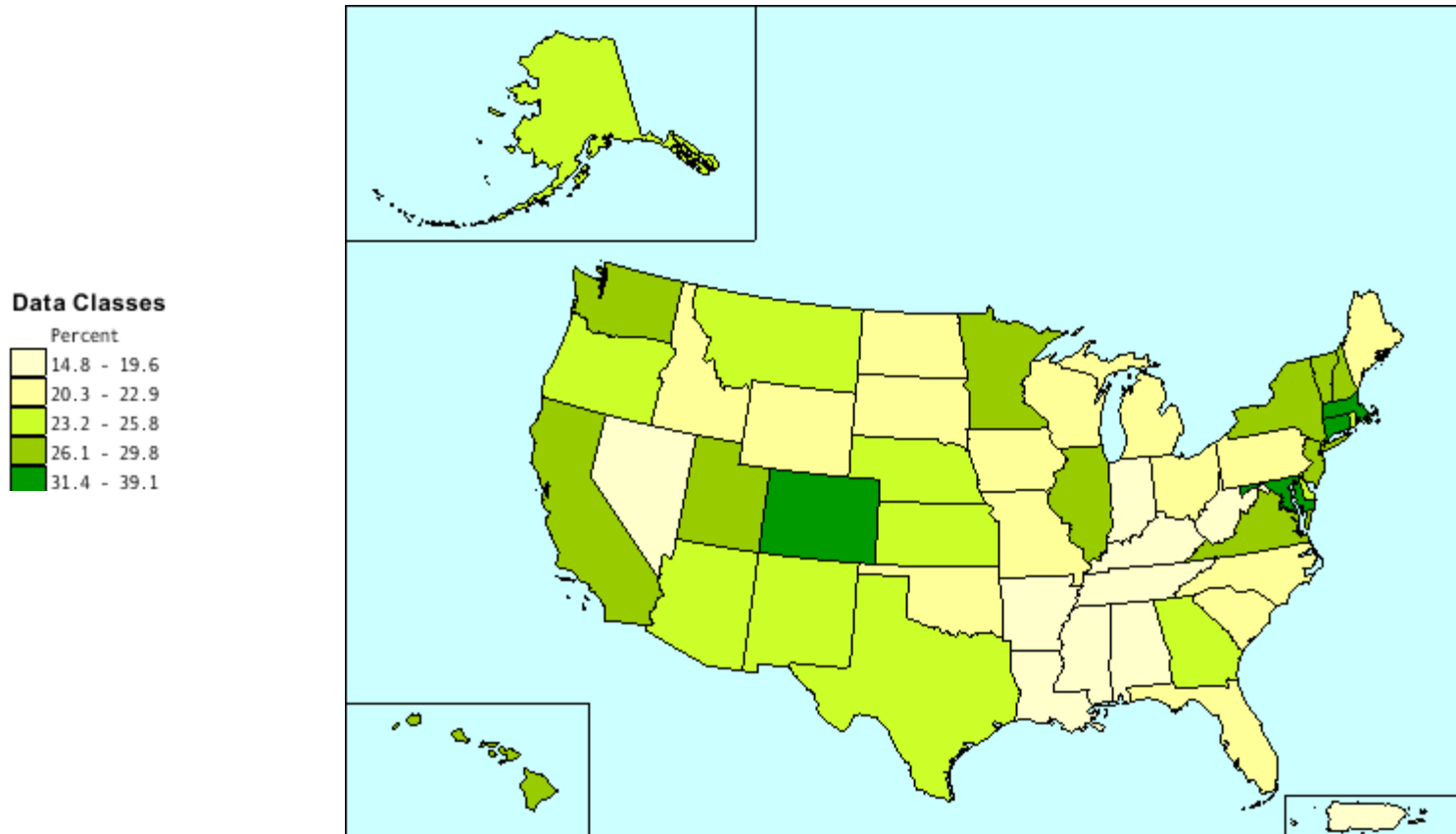
Data Classes

Percent

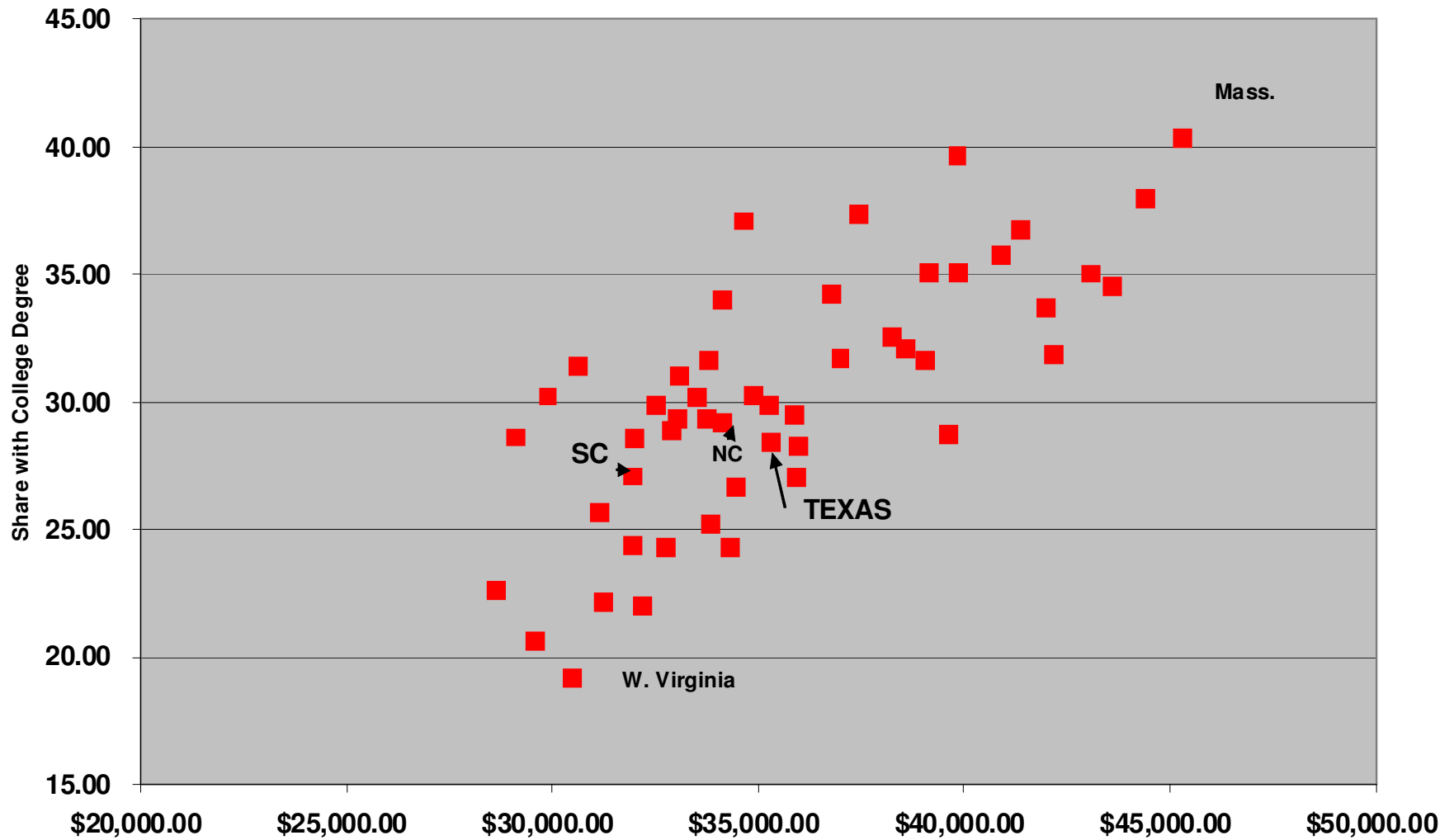


2005 Over 25 Population with High School Education

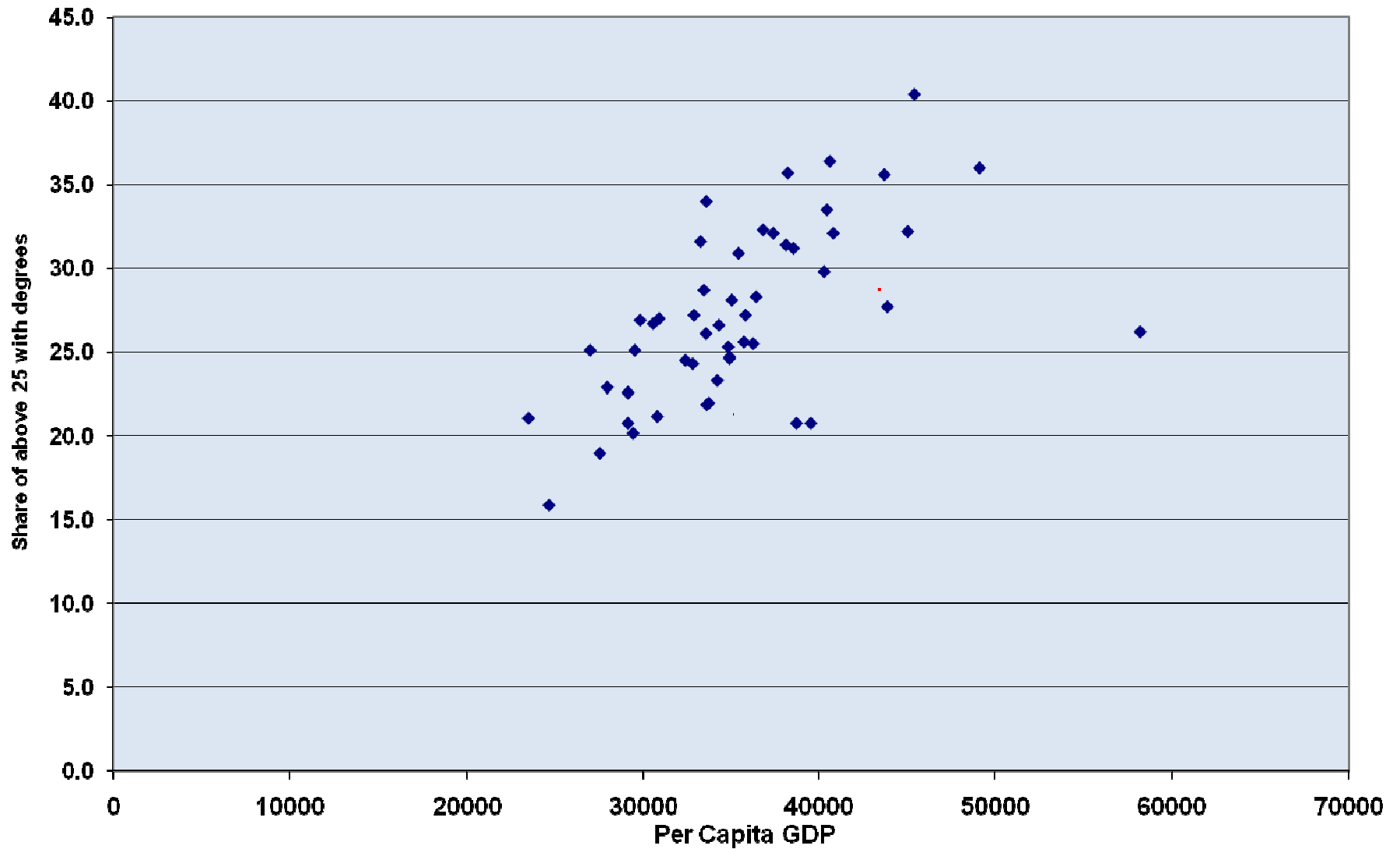
Percent of Population 25 or older with Bachelor's Degree or Higher, 2005



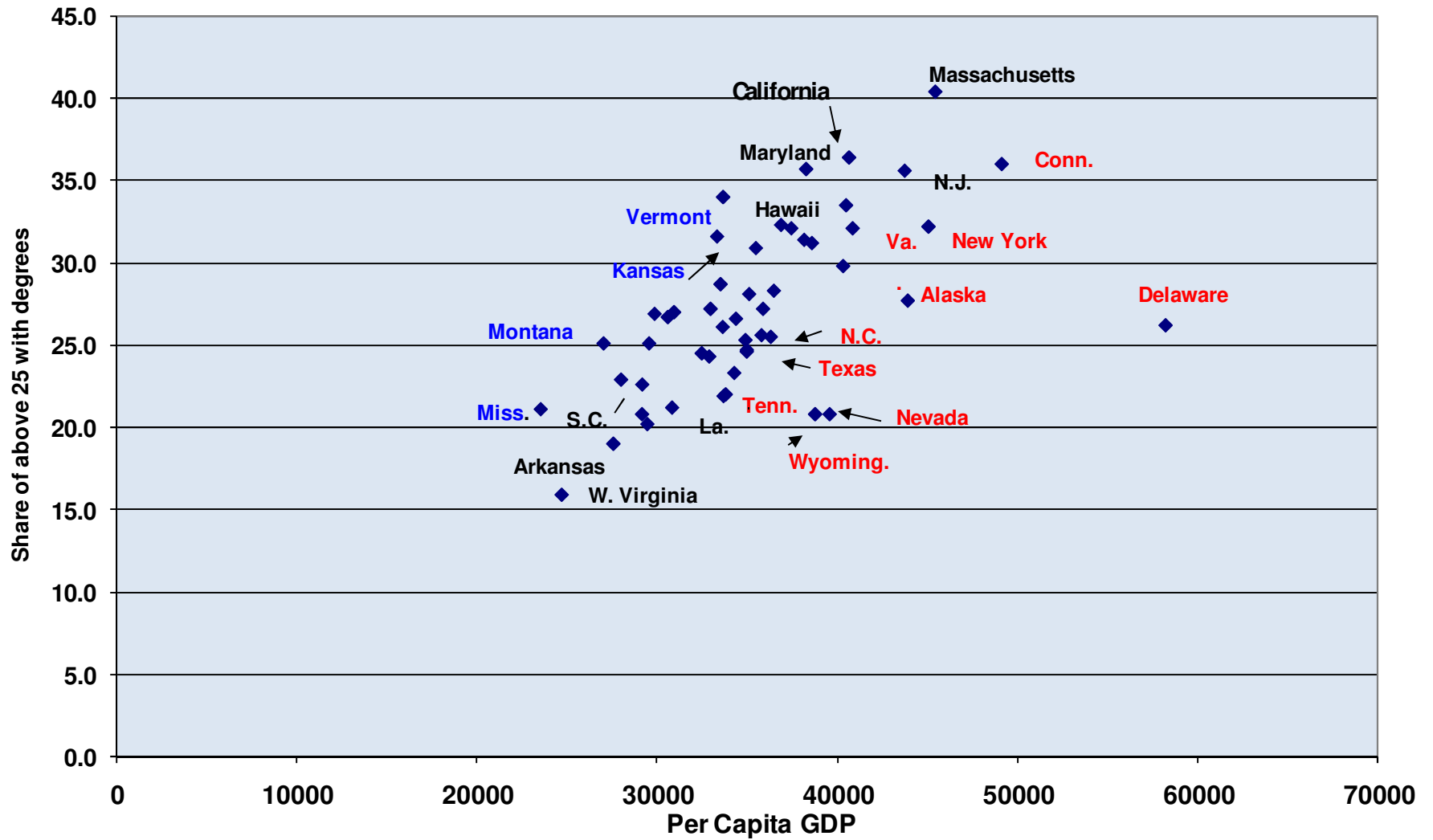
Share of Over-25 with College Degrees and Per Capita Income 2000



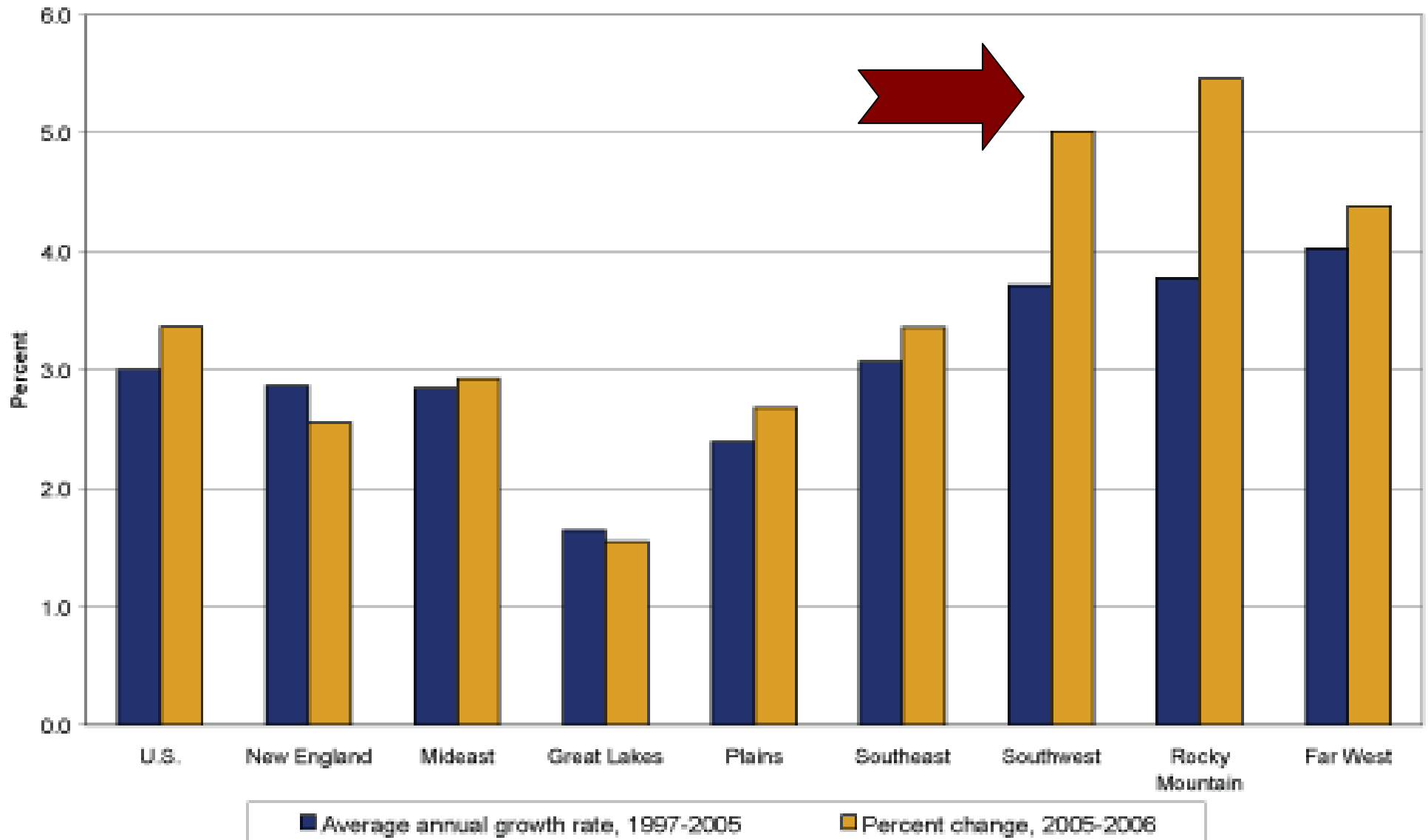
Bachelor's Degrees & Per Capita GDP, 2006



Bachelor's Degrees & Per Capita GDP, 2006



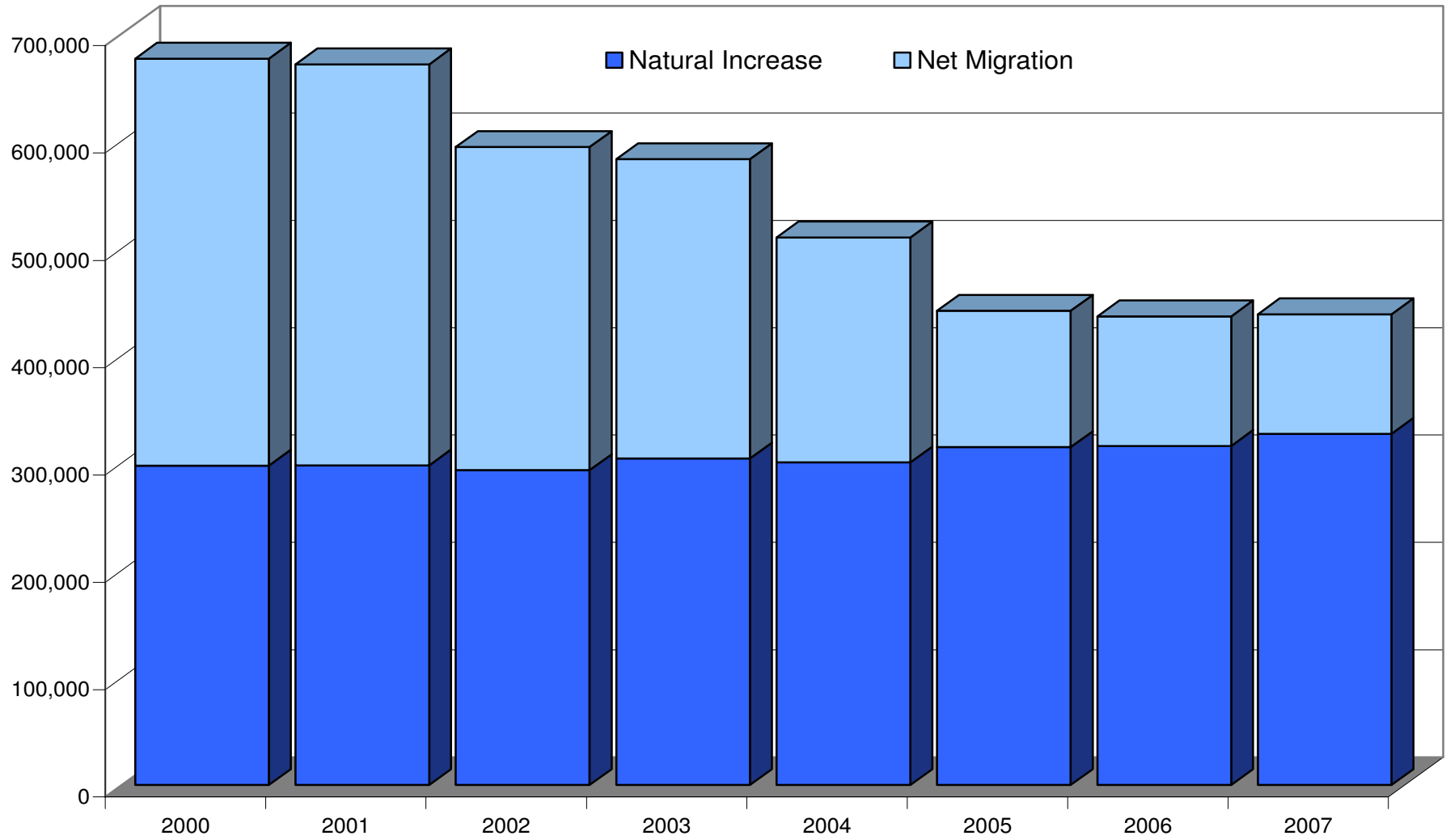
Growth Rates, Regional Real GDP, 1997-2006



* Advance estimates

Source: U.S. Bureau of Economic
Analysis

California Population Growth due to Natural Increase and Net Migration: 2000-2007



ALEC-Laffer State Performance Index: 1996-2006

Rank	State	Absolute Migration	Per Capita Personal Income	Employment
1	Texas	3	12	7
2	Florida	1	23	4
3	Arizona	2	24	2
4	Virginia	12	7	12
5	Montana	21	3	10
6	Wyoming	27	1	6
7	Colorado	9	17	9
8	N. Mexico	28	10	8
9	Oklahoma	3	2	23
10	Idaho	13	33	3
28	Oregon	11	46	21
29	California	49	15	14
30	Kentucky	14	34	32
41	Nebraska	37	39	26
42	Mississippi	38	27	46
43	Louisiana	41	11	49
44	Pennsylvania	32	26	40
45	Iowa	38	36	37
46	Indiana	32	40	45
47	New York	50	29	38
48	Illinois	48	44	47
49	Ohio	45	47	48
50	Michigan	43	49	50

Average Annual Per Capita Real GDP Growth: 2000-2006

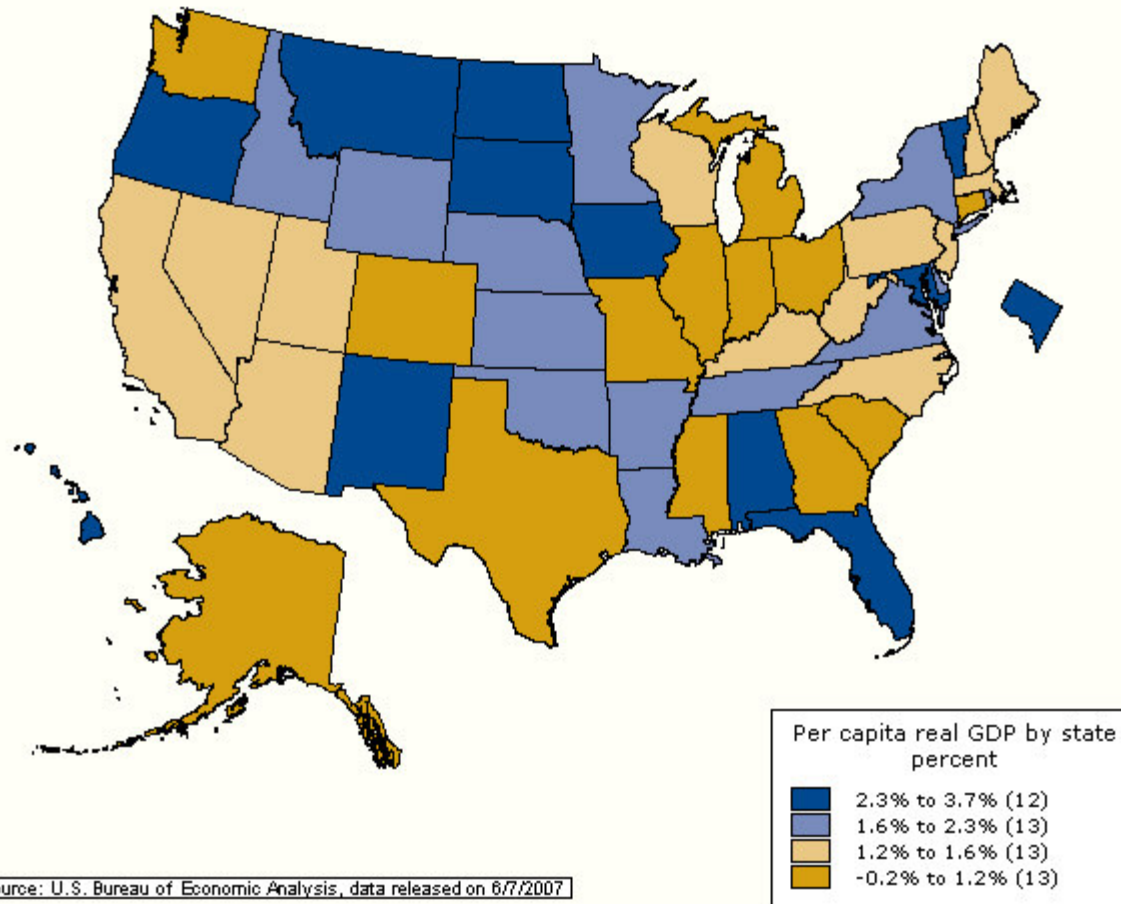
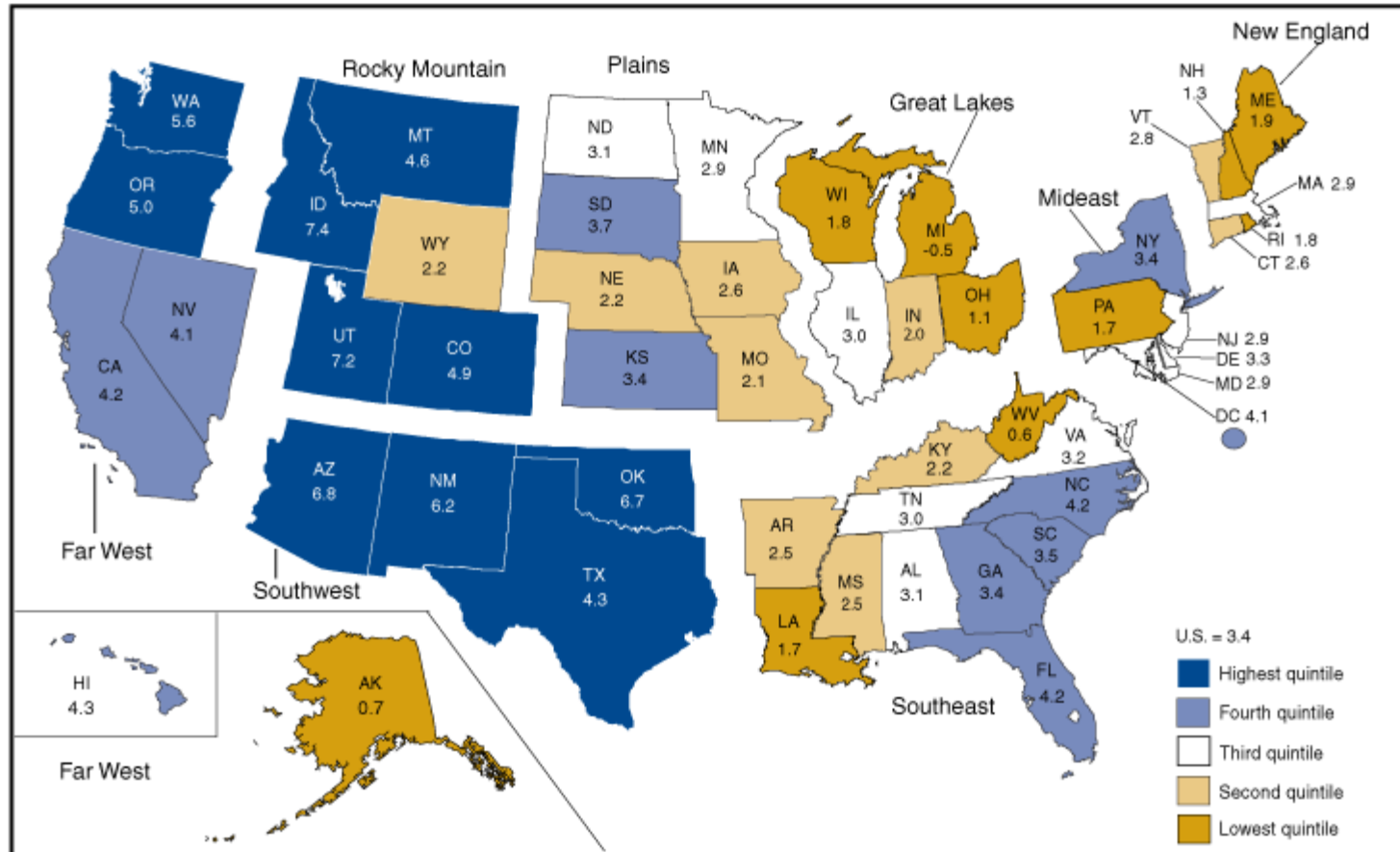


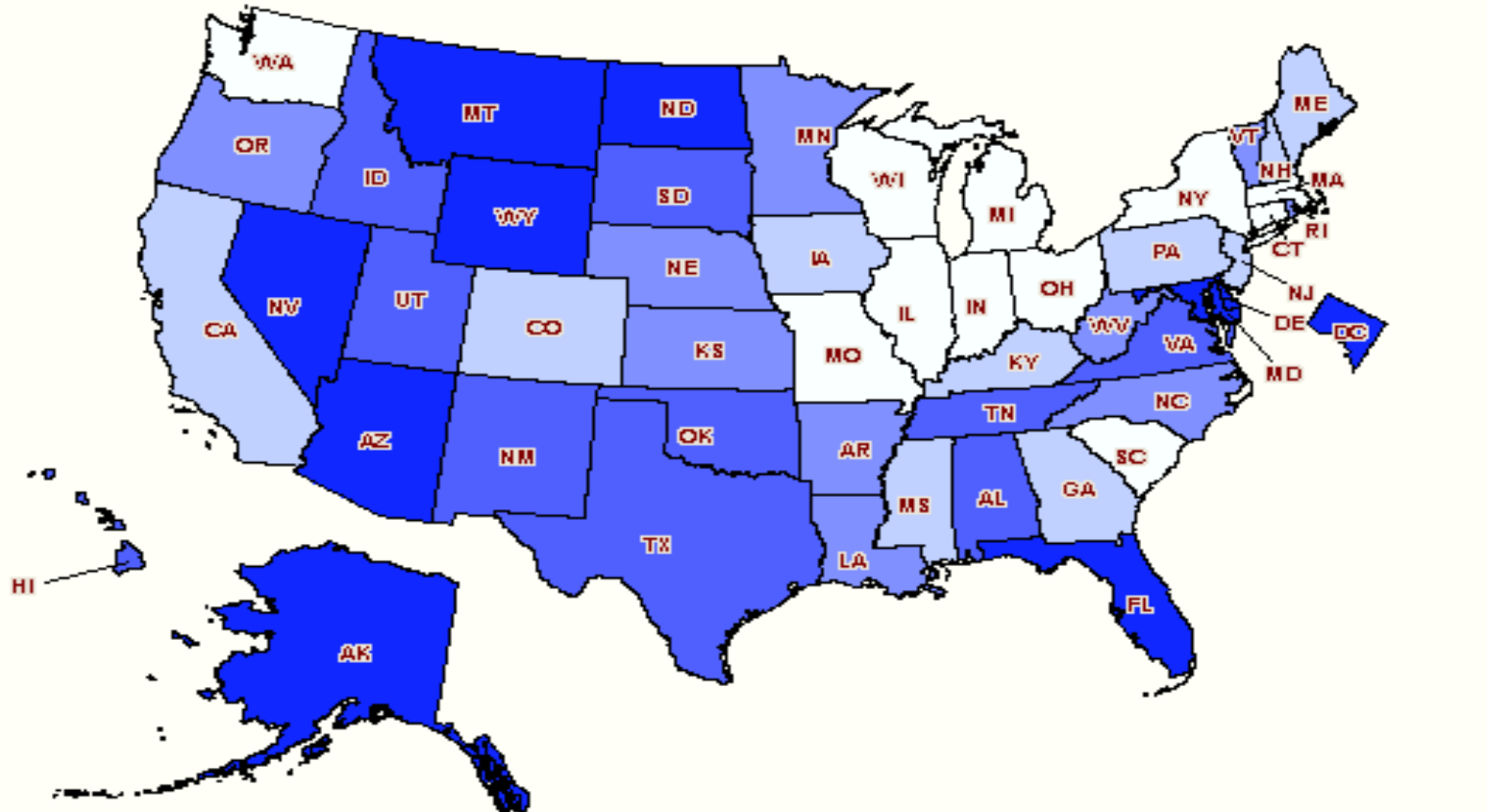
Chart 1. Percent Change in Real GDP by State, 2005-2006



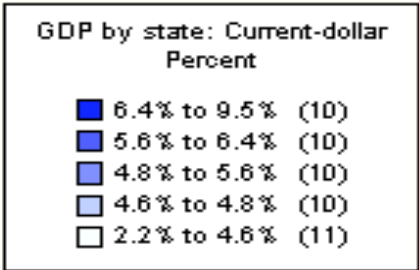
U.S. Bureau of Economic Analysis

AVERAGE STATE GDP GROWTH: 2000-2005

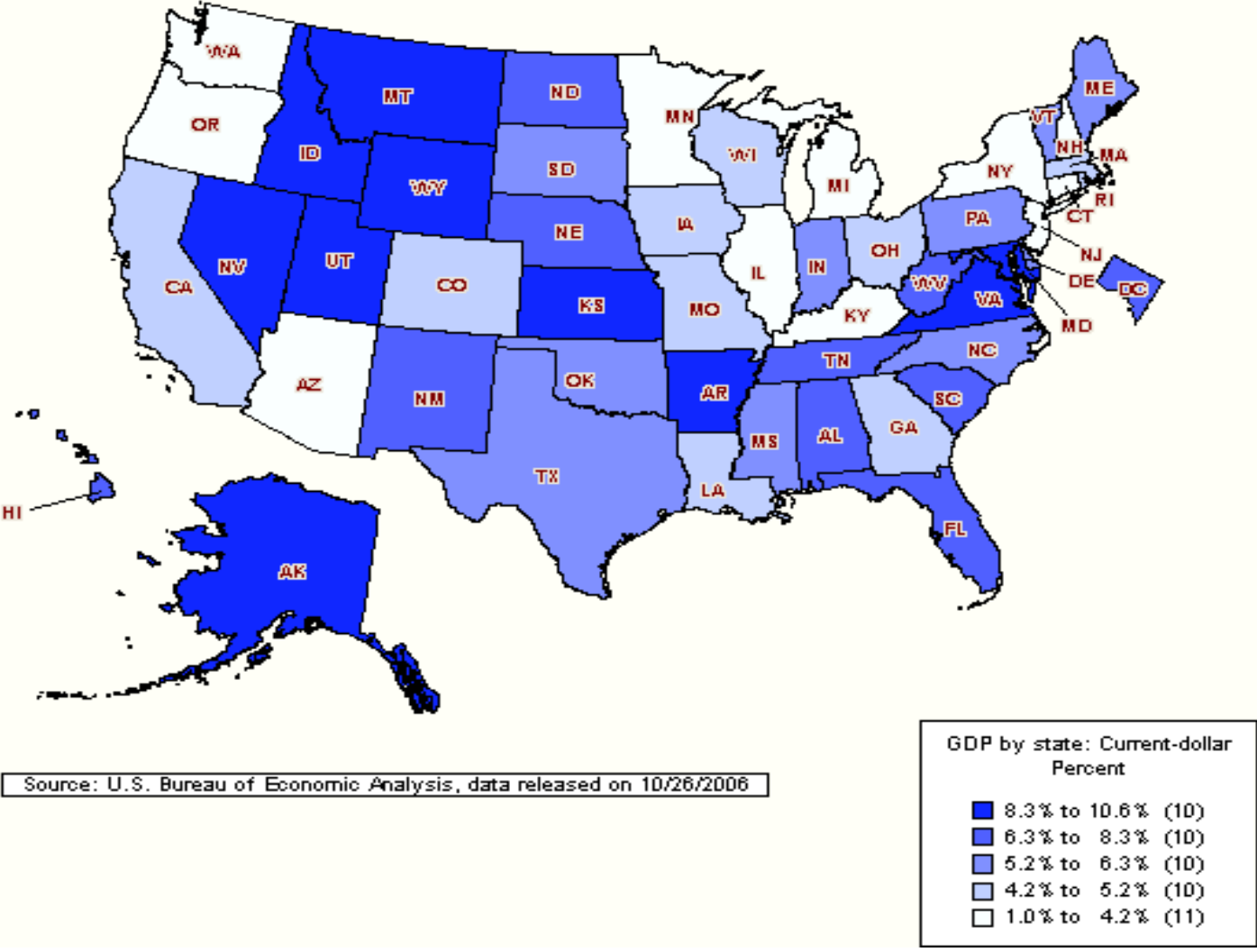
Nominal Chained Dollars



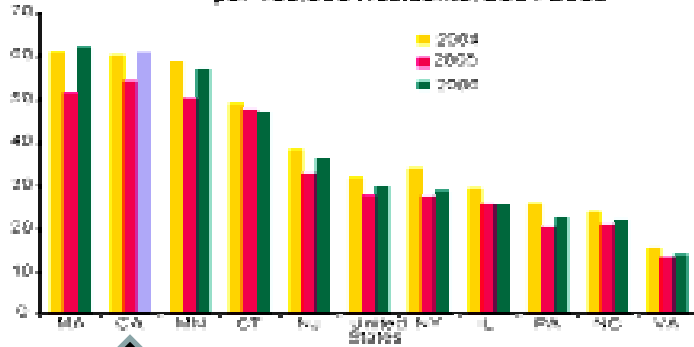
Source: U.S. Bureau of Economic Analysis, data released on 10/26/2006



GDP GROWTH FROM PROFESSIONAL & TECHNICAL SERVICES: 2000-2005



Number of Patents Issued in Leading Technology States, per 100,000 Residents, 2004-2006



Source: Massachusetts Technology Collaborative and the US Patent and Trademark Office

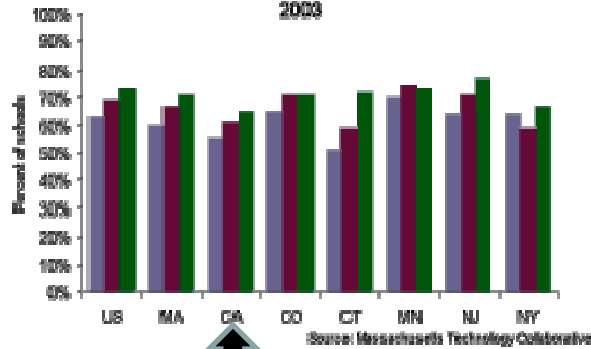


Percent with a BA or Higher, Boston & Competitor Metros, 2005



Source: US Census Bureau

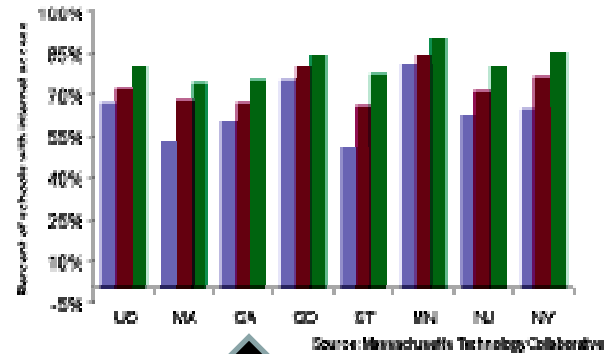
Percent of schools where at least half the teachers use the Internet for instruction, Massachusetts and LTS: 2000-2003



Source: Massachusetts Technology Collaborative



Schools with broadband as percent of those connected to the Internet, Massachusetts and LTS: 2000-2003



Source: Massachusetts Technology Collaborative



How Texas Cities Compare with 115 Others

The Top Eight

Share of Adult Population with College Degrees, 2000.

Leading Southern Metropolitan Areas

1. Charlottesville	40.1%
2. Raleigh-Durham-Chapel Hill	38.9
3. Gainesville, FL	38.7
4. Bryan-College Station	37.0
5. Austin	36.7
6. Tallahassee	36.7
7. Athens, GA	34.1
8. Atlanta	32.0

Source: U.S. Census, 2000

Percentage of Metropolitan Labor Force in Professional Occupations, 2000*

Leading Southern Metropolitan Areas

1. Huntsville	10.1%
2. Raleigh-Durham-Chapel Hill	8.5
3. Melbourne-Titusville-Palm Bay	8.1
4. Austin	7.7
5. Dallas-Fort Worth-Arlington	6.3
6. Houston	5.9
7. Tallahassee	5.1
8. Atlanta	4.7

* Professional occupations include Computer and Mathematical Operations (15-000); Life, Physical and Social Science. Occupations (19-0000); and Architecture and Engineering Occupations (17-0000)

Share of Establishments in Professional, Scientific, and Technical Services Industries (NAICS 54), 1997

Leading Southern Metropolitan Areas

1. Miami – Fort Lauderdale, FL	27.7%
2. Richmond – Petersburg, VA	14.1
3. Tallahassee, FL	12.7
4. Austin-San Marcos	12.7
5. Atlanta	12.2
6. West Palm Beach – Boca Raton, FL	12.1
7. Huntington-Ashland, WVA-KY-OH	11.4
8. Raleigh-Durham-Chapel Hill, NC	11.4

* Source: 1997 Economic Census

** NAICS 54 activities include legal advice and representation; accounting, bookkeeping, and payroll services; architectural, engineering, and specialized design services; computer services; consulting services; research services; advertising services; photographic services; translation and interpretation services; veterinary services; and other professional, scientific, and technical services.

Patents Per 1000 People by Southern Metropolitan Area, 1995-1999

Leading Southern Metropolitan Areas

1. Austin-San Marcos	4.28
2. Baton Rouge	3.71
3. Raleigh-Durham-Chapel Hill	2.66
4. Gainesville, FL	1.96
5. West Palm Beach-Boca Raton	1.75
6. Houston	1.52
7. Dallas-Fort Worth-Arlington	1.49
8. Melbourne-Titusville-Palm Bay	1.45

Total R&D Expenditures at Universities and Colleges, 1998-2000

<u>Area</u>	<u>Total R&D 1998-2000</u>	<u>R&D Expenditures Per Capita</u>
<i>Leading Southern Metropolitan Areas</i>		
1. Bryan-College Station, TX	1,193,191,000	\$7.81
2. Athens, GA	713,914,000	4.63
3. Gainesville, FL	893,001,000	4.09
4. Baton Rouge, LA	703,565,000	3.62
5. Hattiesburg, MS	388,843,000	3.46
6. Charlottesville, VA	410,689,000	2.56
7. Auburn-Opelika, AL	260,924,000	2.26
8. Raleigh-Durham-Chapel Hill, NC	2,550,055,000	2.12

Source: National Science Foundation

Change in Utility Patent Activity 1992-2004, Southern States

State	1992-93-94 Average	2002-03-04 Average	Percentage Change
North Carolina	925	1830	+97.8%
Georgia	727	1319	+81.5%
Texas	3542	5995	+69.3%
U.S.			+60.4%
Kentucky	274	432	+57.5%
Alabama	262	390	+48.9%
Tennessee	560	770	+37.5%
Florida	1842	2471	+34.2%
South Carolina	426	564	+32.4%
Mississippi	114	151	+32.4%
Virginia	874	1117	+27.8%
Arkansans	127	156	22.8%
Louisiana	441	393	-11.0%
Oklahoma	572	476	-16.7%

Source: U.S. Patent and Trademark Office, April 2005.

Entrepreneurial Growth Companies as a Share of Business in Labor Market Areas, 1991-1996.

Entrepreneurial Growth Companies

- Annual employment growth rate \geq 15%
- Employment growth \geq 100% for 1991-96

Southern Metropolitan Areas

<u>Labor Market Area</u>	<u>Companies</u>	<u>High Growth</u>	<u>Share</u>
Austin	20,915	1,514	7.2%
Atlanta	69,279	4,479	6.5
Nashville	24,458	1,465	6.0
Pensacola	10,863	643	5.9
Raleigh	25,768	1,507	5.8
Little Rock	13,036	757	5.8
Charlotte	28,383	1,544	5.4
United States Average			4.7

Source: National Commission on Entrepreneurship, 2001.

Economic Performance: Summary

- Weak recent record of economic growth and wealth creation.
- High and growing tax burden.
- Low economic freedom.
- Weak secondary education baseline. But strong higher education component.
- Large services economy.
- Exporting domestic population

The New Economy

California ranks number 5 in 2007, following Massachusetts, New Jersey, Washington, and Maryland. Was number 2 in 1999 and 2002.

Number one in patents. Number 3 in IPOs. High in fast growth firms and IT related activities.

Weak in attracting knowledge workers.

Looking for the Knowledge Economy

How to get the
brains..., and get
them connected?



But wait a minute.

What is the Knowledge Economy?

- **A situation where value lies increasingly in new ideas, software, services and relationships.**
- **An economy characterized by the recognition of knowledge as the source of competitiveness, the increasing importance of science, research, technology and innovation in knowledge creation, and the use of computers and the internet to generate, share and apply knowledge.**

oOo

For countries in the vanguard of the world economy, the balance between knowledge and resources has shifted so far towards the former that knowledge has become perhaps the most important factor determining the standard of living—more than land, than tools, than labor. Today's most technologically advanced economies are truly knowledge-based.

The Knowledge Problem

The **KNOWLEDGE PROBLEM** joins **ORDER** as the fundamental economic problem faced by all human communities, from the earliest origins to global community life today.

The knowledge problem is not just about ignorance. It's about the challenge of finding and organizing existing knowledge.

Knowledge is dispersed. Yet human challenges are concentrated in time and place.

How do we get all those brains connected?

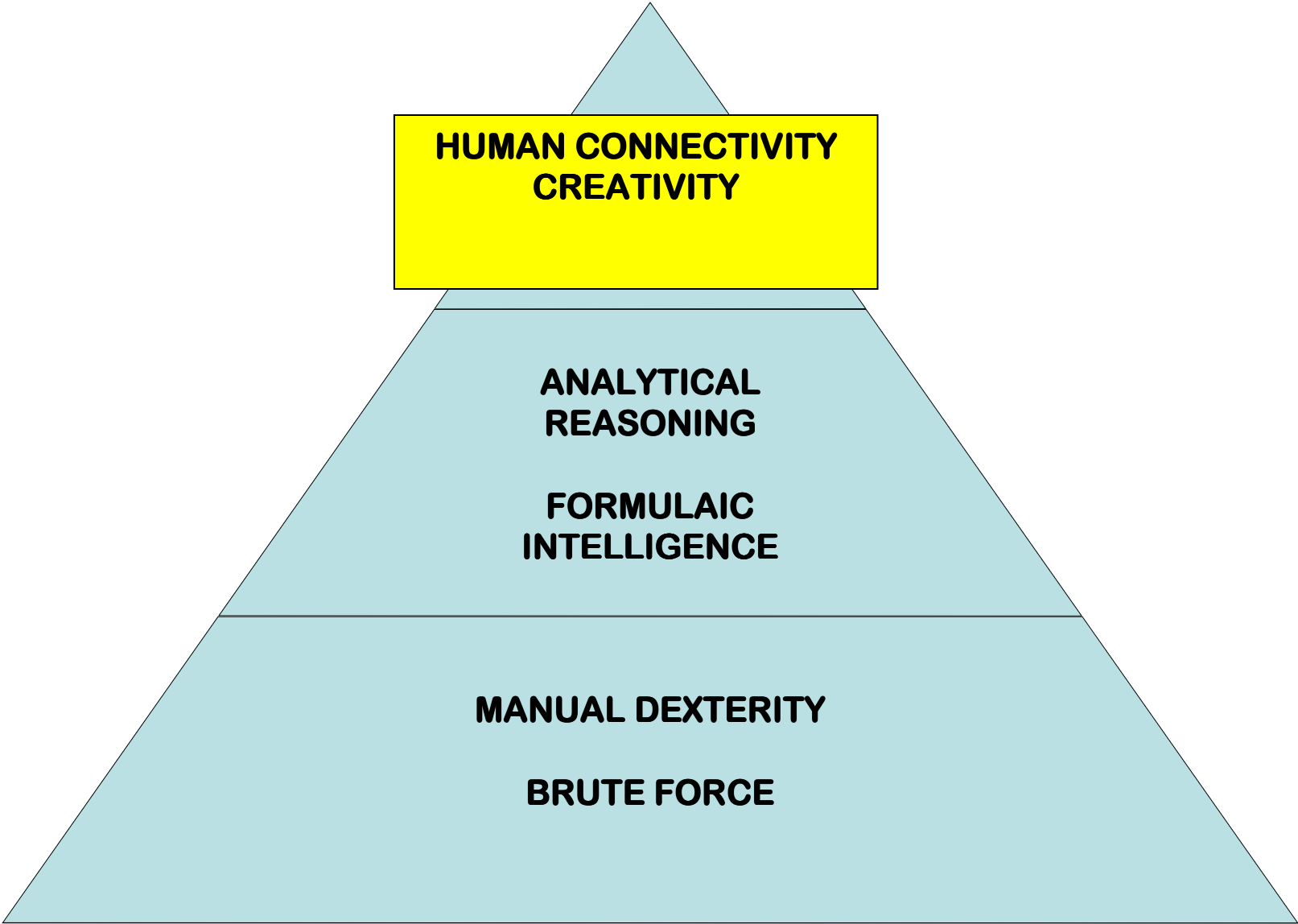
Every individual...generally, indeed, neither intends to promote the public interest, nor knows how much he is promoting it. ...[B]y directing that industry in such a manner as its produce may be of the greatest value, he intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention.

Adam Smith. *Inquiry into the Nature and Causes of the Wealth of Nations*.
1776. Book IV, Ch. 8.

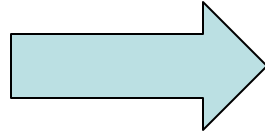
[G]uiding any invisible hand there must be an “invisible brain.” Its neurons are people. The more neurons there are in regular and easy contact, the better the brain works—the more finely it can divide economic labor, the more diverse the resulting products. And, not incidentally, the more rapidly technological innovations take shape and spread.

Robert Wright. *Nonzero: The Logic of Human Destiny*.
2000. Ch. 4, 48.

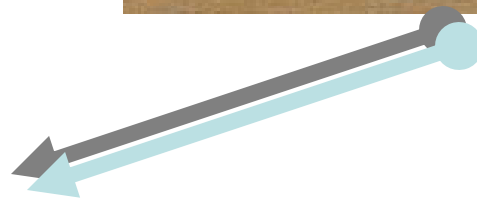
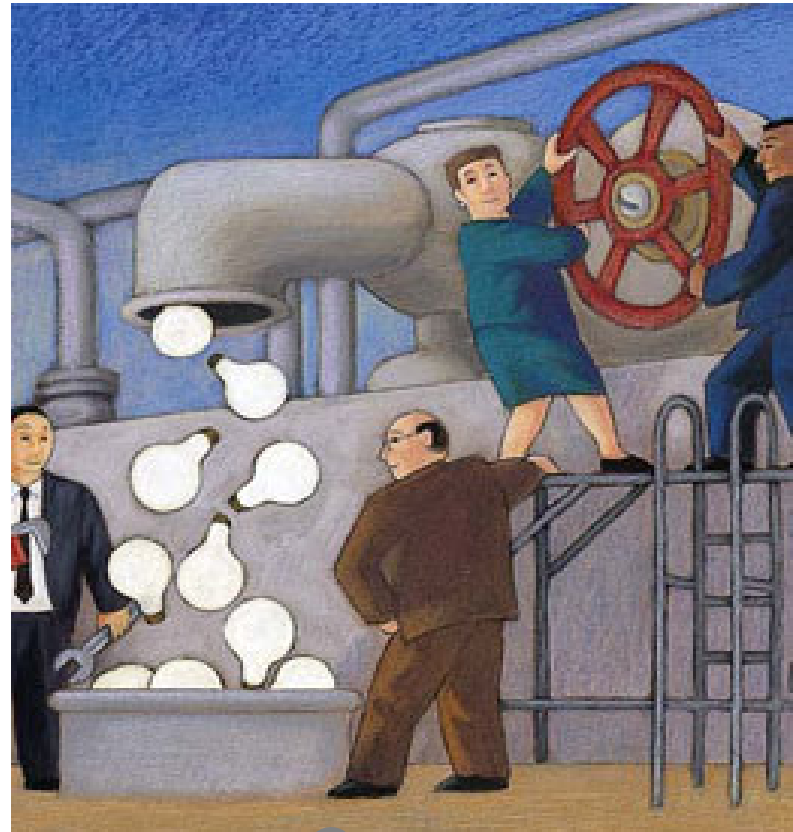
TOTEM OF HUMAN TALENTS



Source: Michael Cox. Federal Reserve
Bank of Dallas



How to get from random idea generation to an idea/innovation culture?



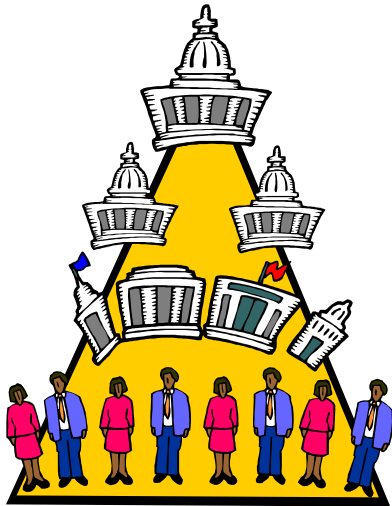
And then to wealth creation?

Firms and Institutions are also Disintegrating

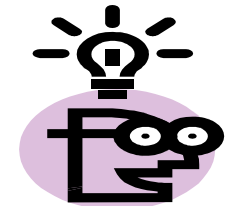
Hierarchies are collapsing.

Organizations are decentralizing.

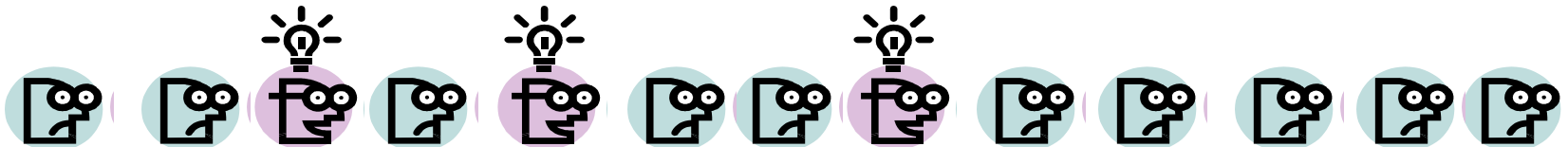
Individuals are breaking down walls.



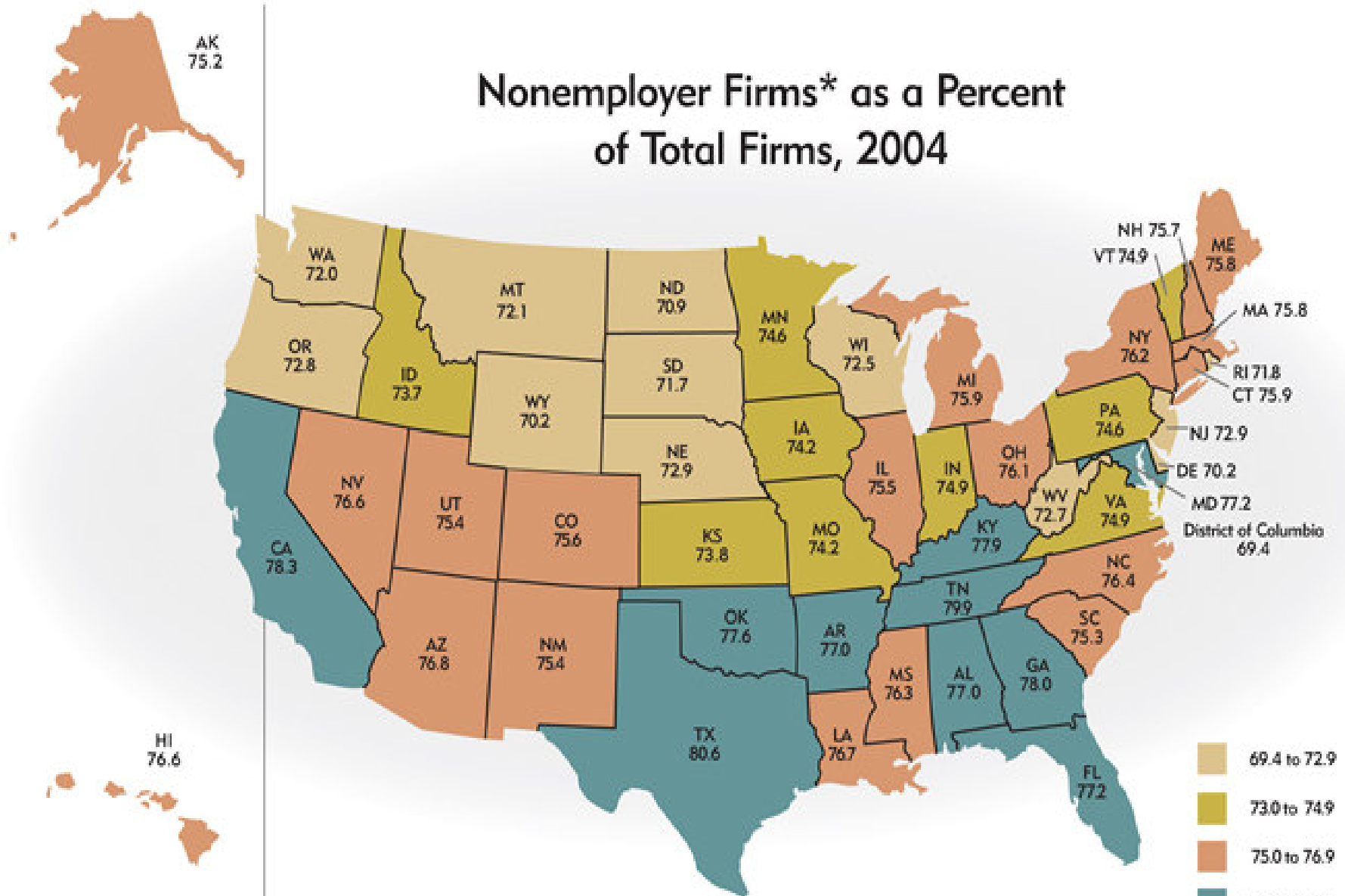
Collapsing hierarchies lead to small knowledge-based entrepreneur-led firms and activities.



And more frequent bright ideas



Nonemployer Firms* as a Percent of Total Firms, 2004



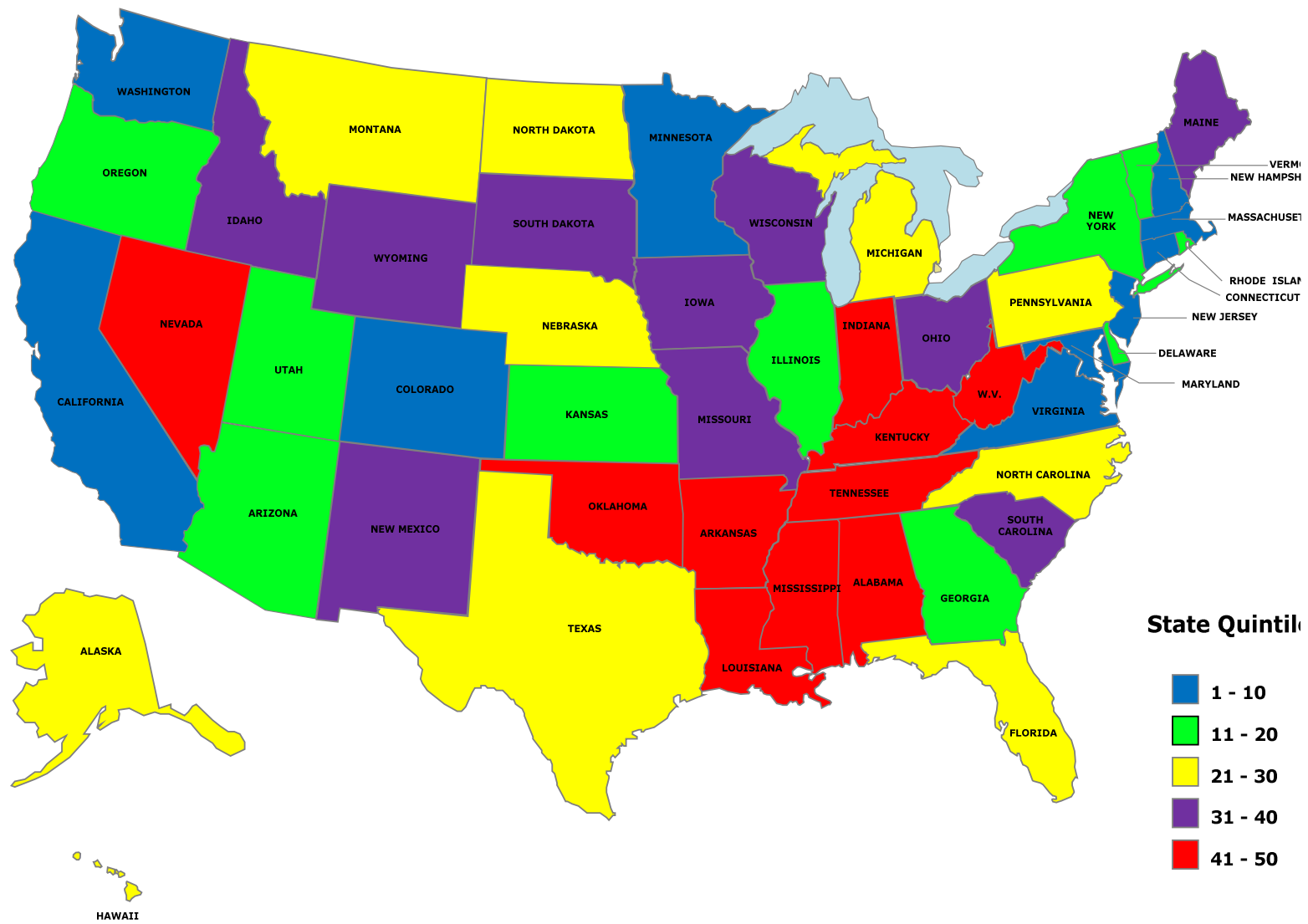
* A nonemployer firm has no paid employees, annual business receipts of \$1,000 or more and is subject to federal income taxes.

Source: Office of Advocacy, U.S. Small Business Administration

**Per Capita Income = F(Industrial R&D, Fast Growth Firms,
Work Force Ed, Median Age).**

Variable Descriptions

- Industrial R&D – Industry-performed research and development as a percentage of total worker earnings.
- Fast Growth Firms – The number of Deloitte Technology Fast 500 and Inc. 500 firms as a share of total firms in each state.
- Workforce Education – A weighted measure of the educational attainment (advanced degrees, bachelor's degrees, associates degrees, or some college coursework) of each state's workforce.



Knowledge Economy Index

Voting with their Feet

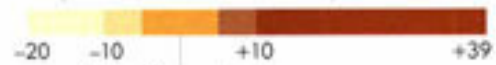


THE MIGRATION OF COLLEGE GRADUATES

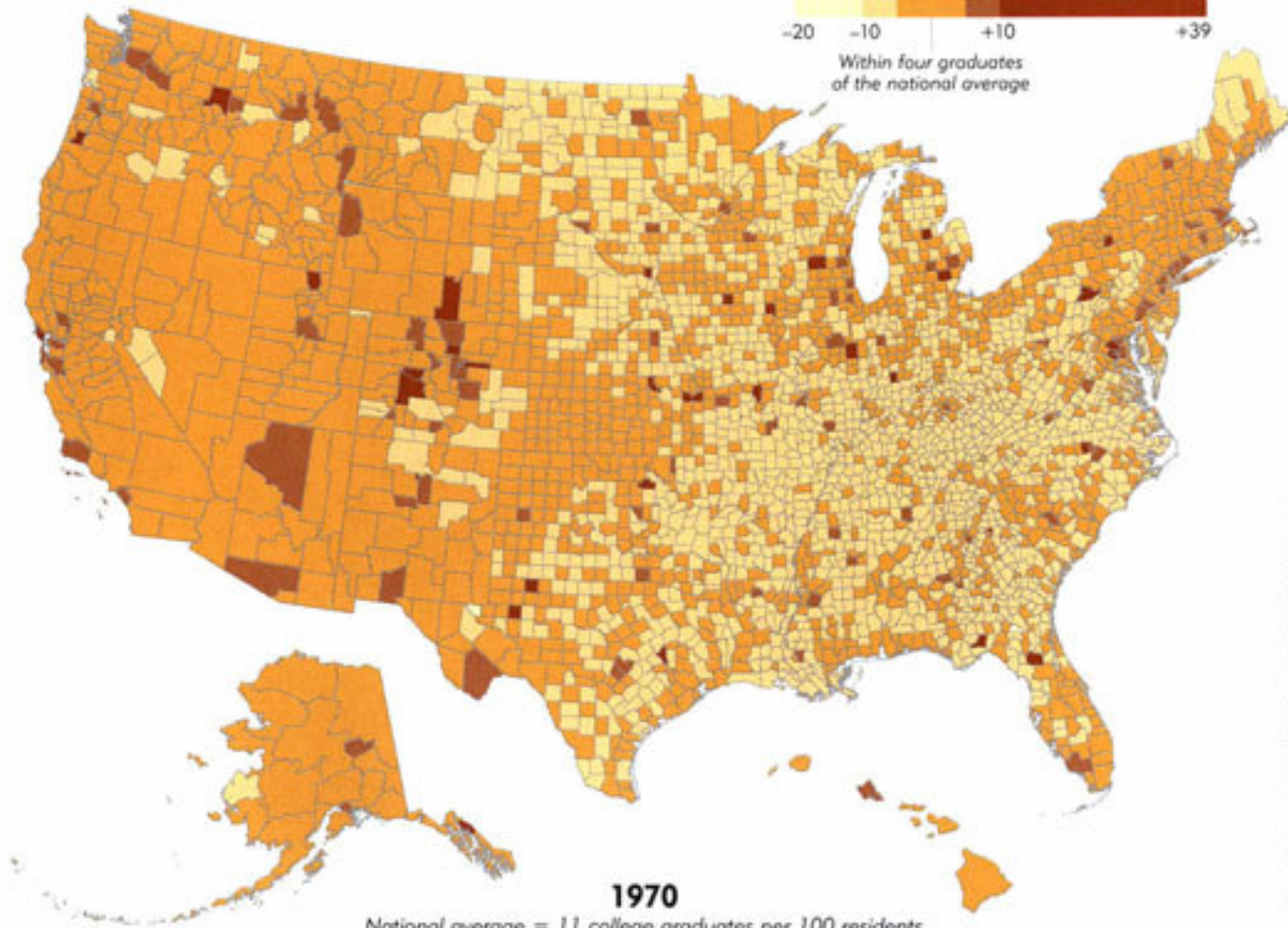
Since 1970, college graduates have flocked to select American cities

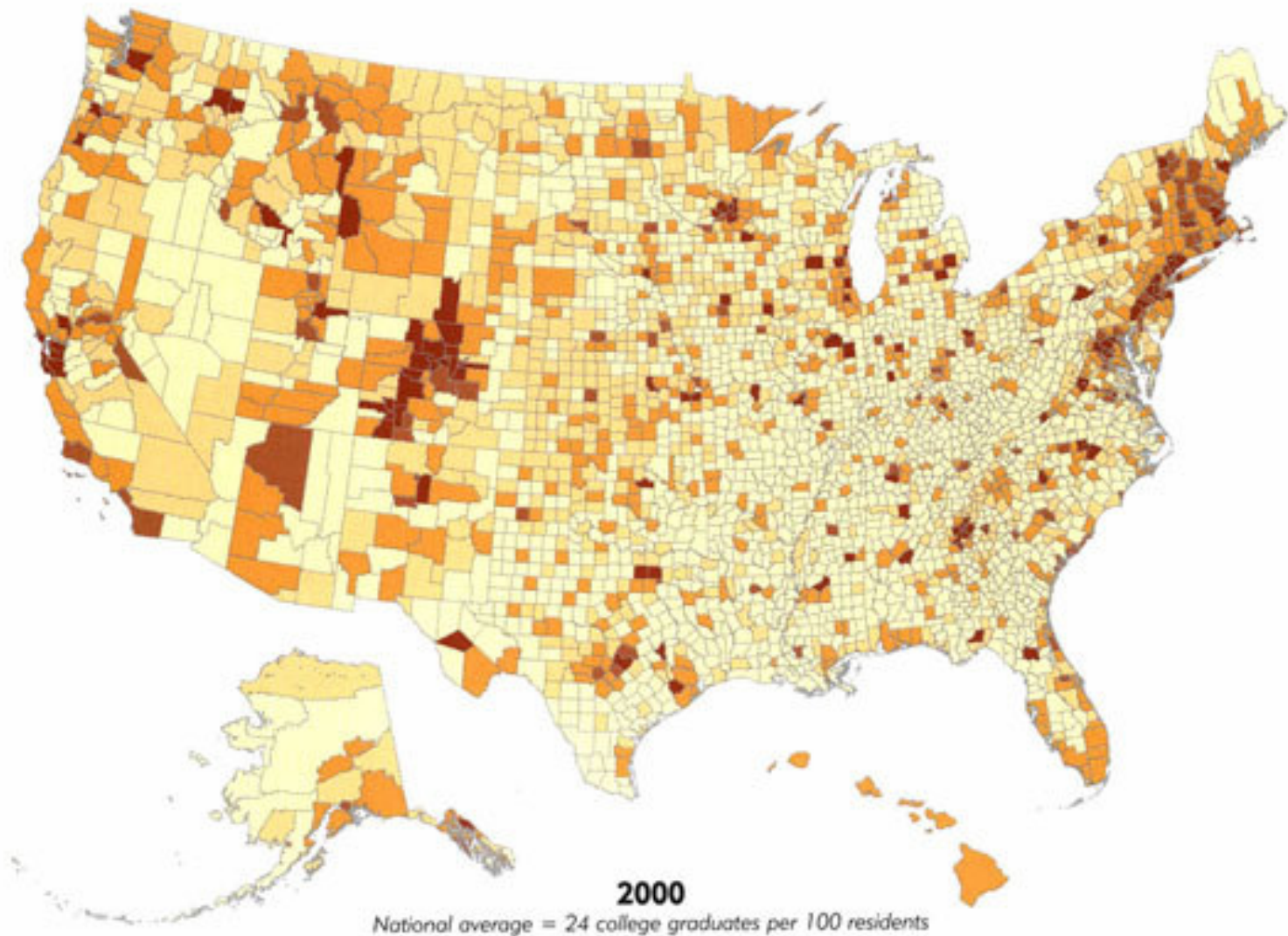
College graduates in each county,
compared with the national average
(per 100 residents)

Fewer More

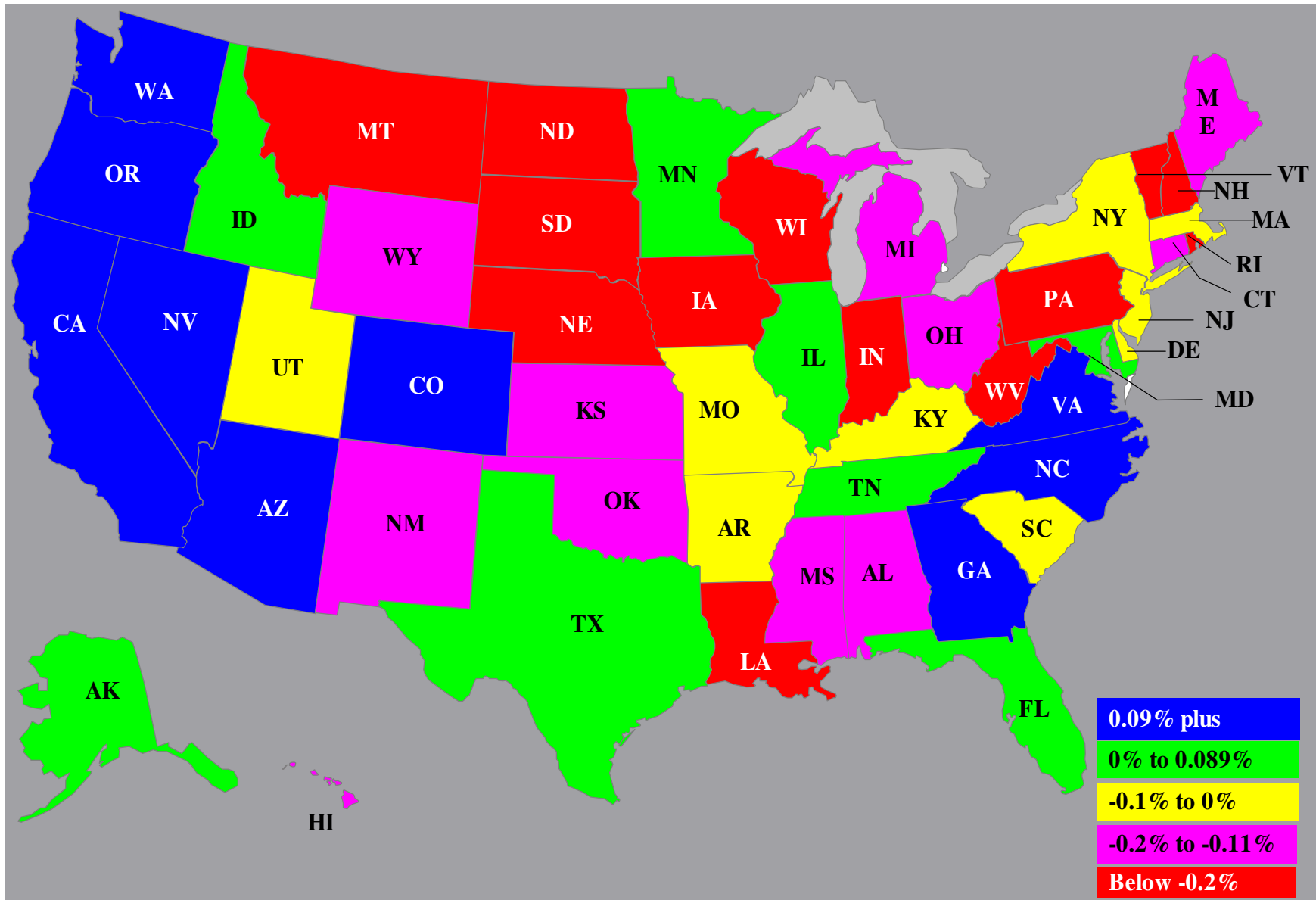


Within four graduates
of the national average





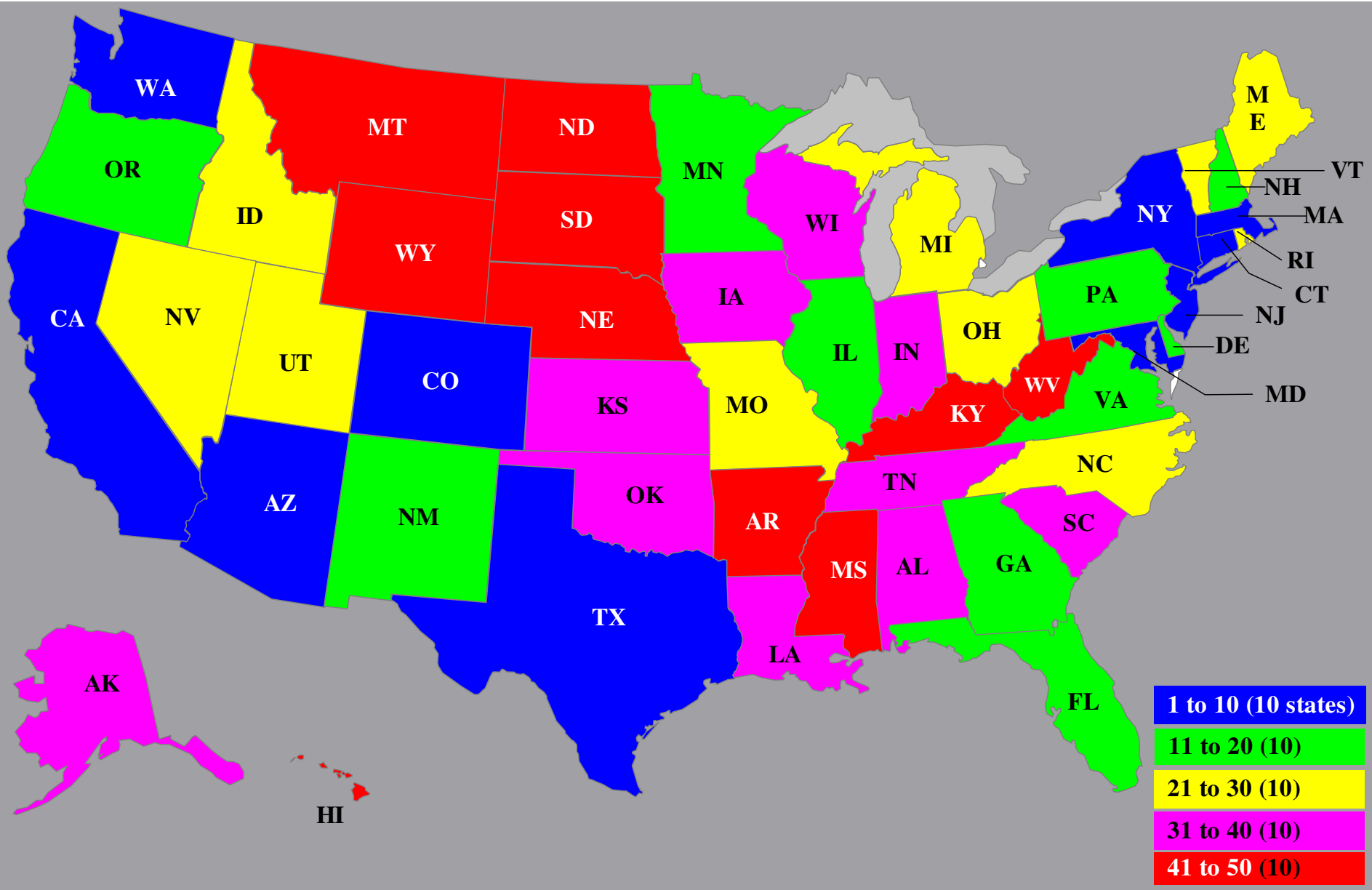
NET 1995-2000 INTERNAL MIGRATION OF PEOPLE WHO WERE 25-39, SINGLE &
COLLEGE EDUCATED
PERCENT OF 2000 POPULATION



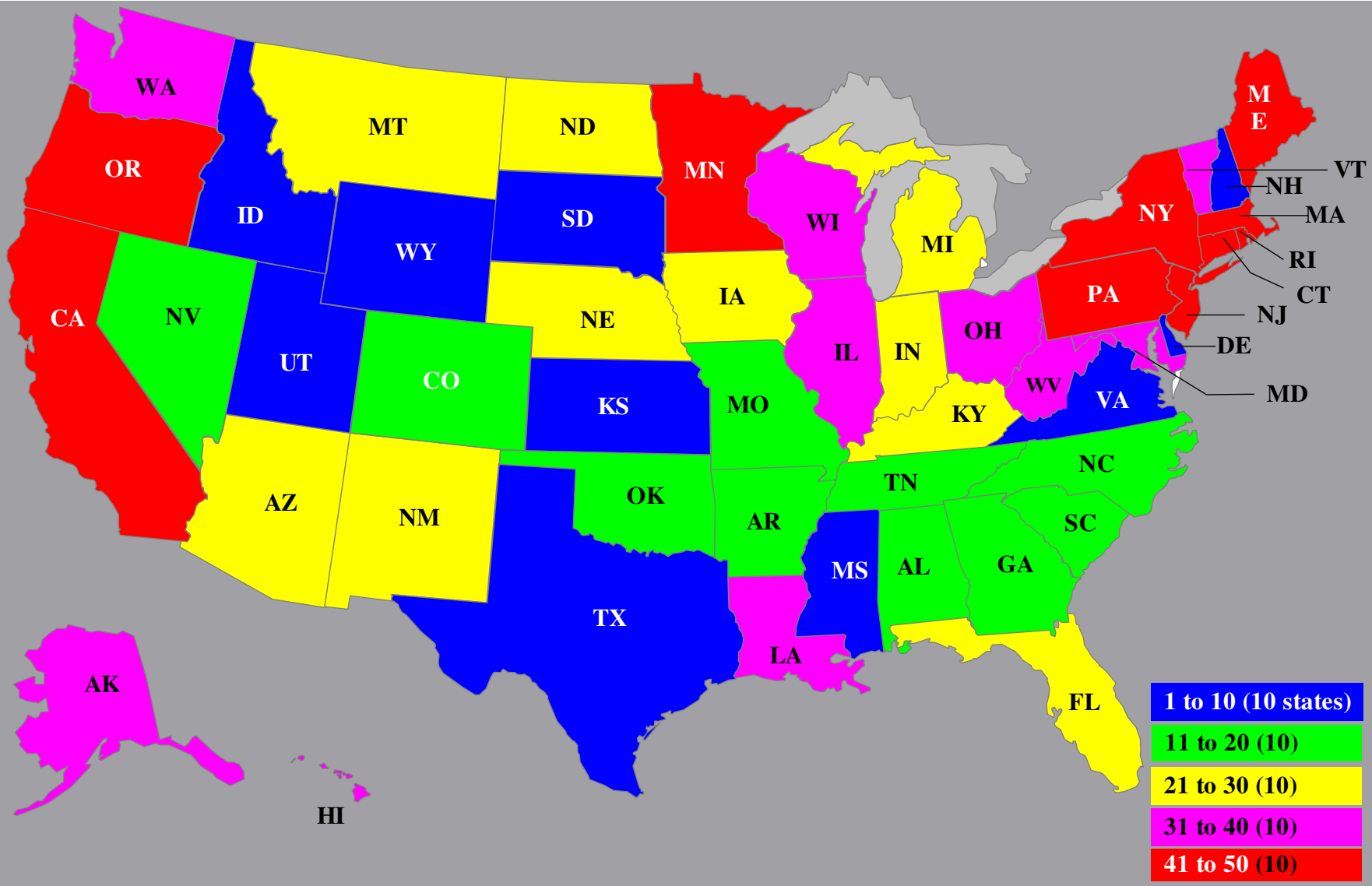
MODELING MIGRATION



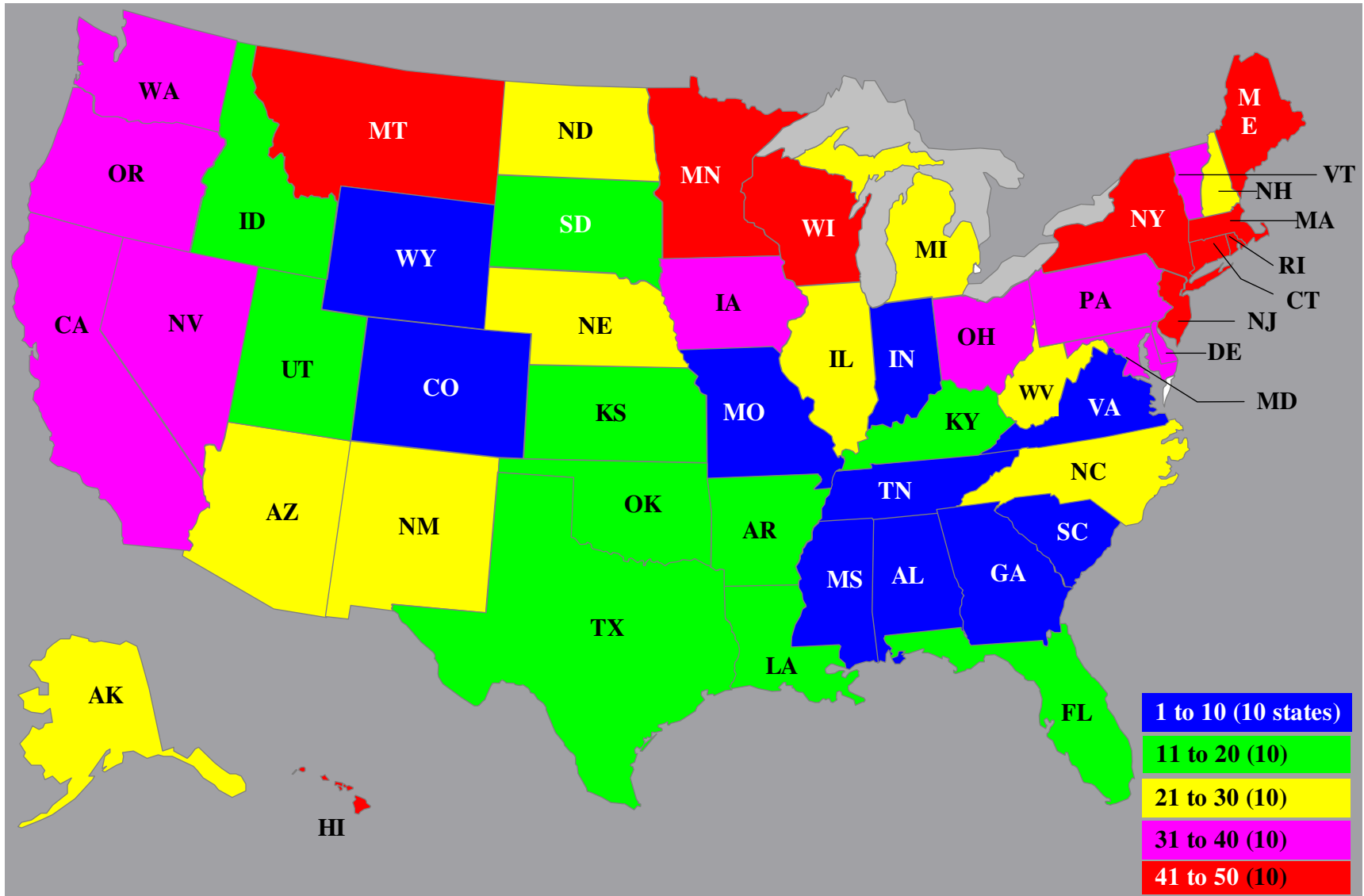
CREATIVITY INDEX 2003 RANKINGS



U.S. ECONOMIC FREEDOM INDEX, 1999



U.S. FREEDOM FISCAL INDEX, 1999



What did we learn?

Go Getters are:

- Highly attracted by larger PBS sector.
- Repelled by state taxes.
- Attracted by “cool” locations.
- Are not sensitive to high versus low income locations.

Lessons to Apply?

- Improve economic freedom.
- Avoid new regulatory burdens. User fees, performance standards where possible.
- Reduce the tax burden.
- Allow innovation in secondary schools.
- Offer new incentives for investment in graduate education tied to remaining.
- Become world leader in water markets.