

*International Comparisons: How Do
the US and Washington Compare and
What Are Other Nations Doing?*

Aims C. McGuinness

Washington Learns Steering Committee

May 15, 2006

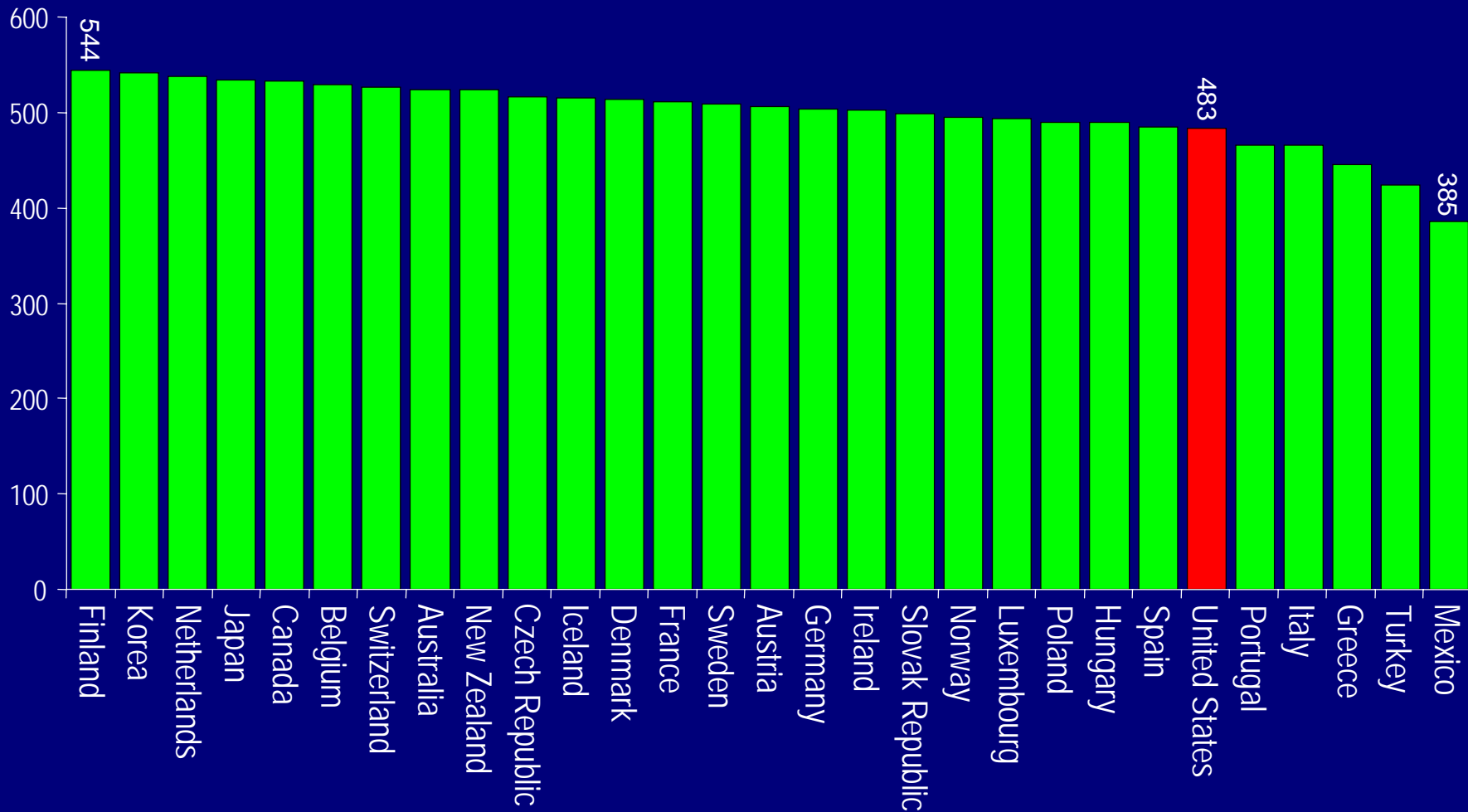
Outline

- International Comparison of Performance: U.S. and Washington State Compared to Other Nations
- Two Case Studies:
 - Ireland
 - Republic of Korea
- Lessons from Other Countries

Comparison of Performance

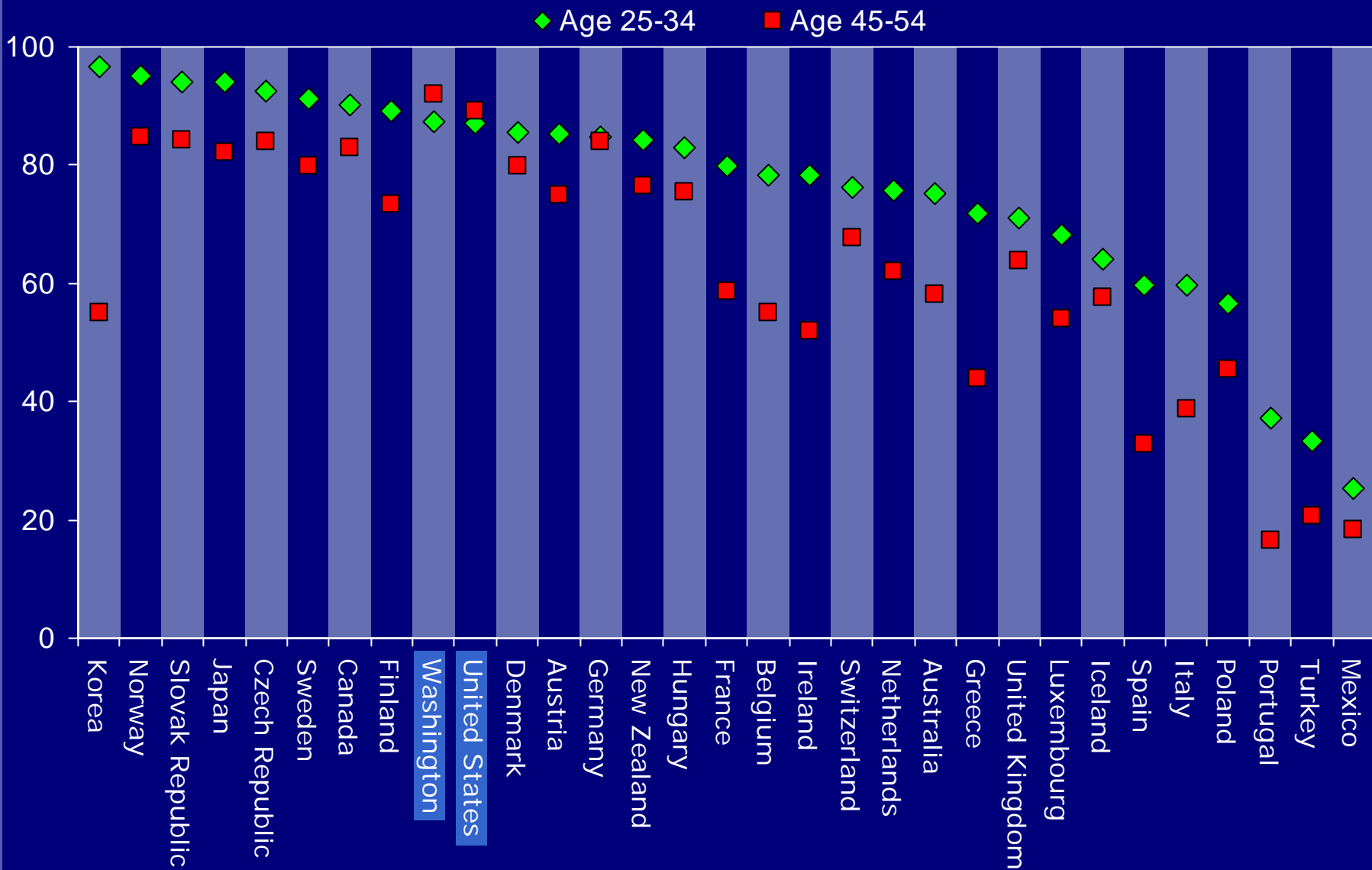
Other Nations Are Quickly Catching Up with or Surpassing U.S.

Mean Score and Variation in Student Performance on the OECD Assessment (PISA) Mathematics Scale, 2003



Source: OECD PISA 2003 database

Percent of Adults with a High School Diploma, 2003

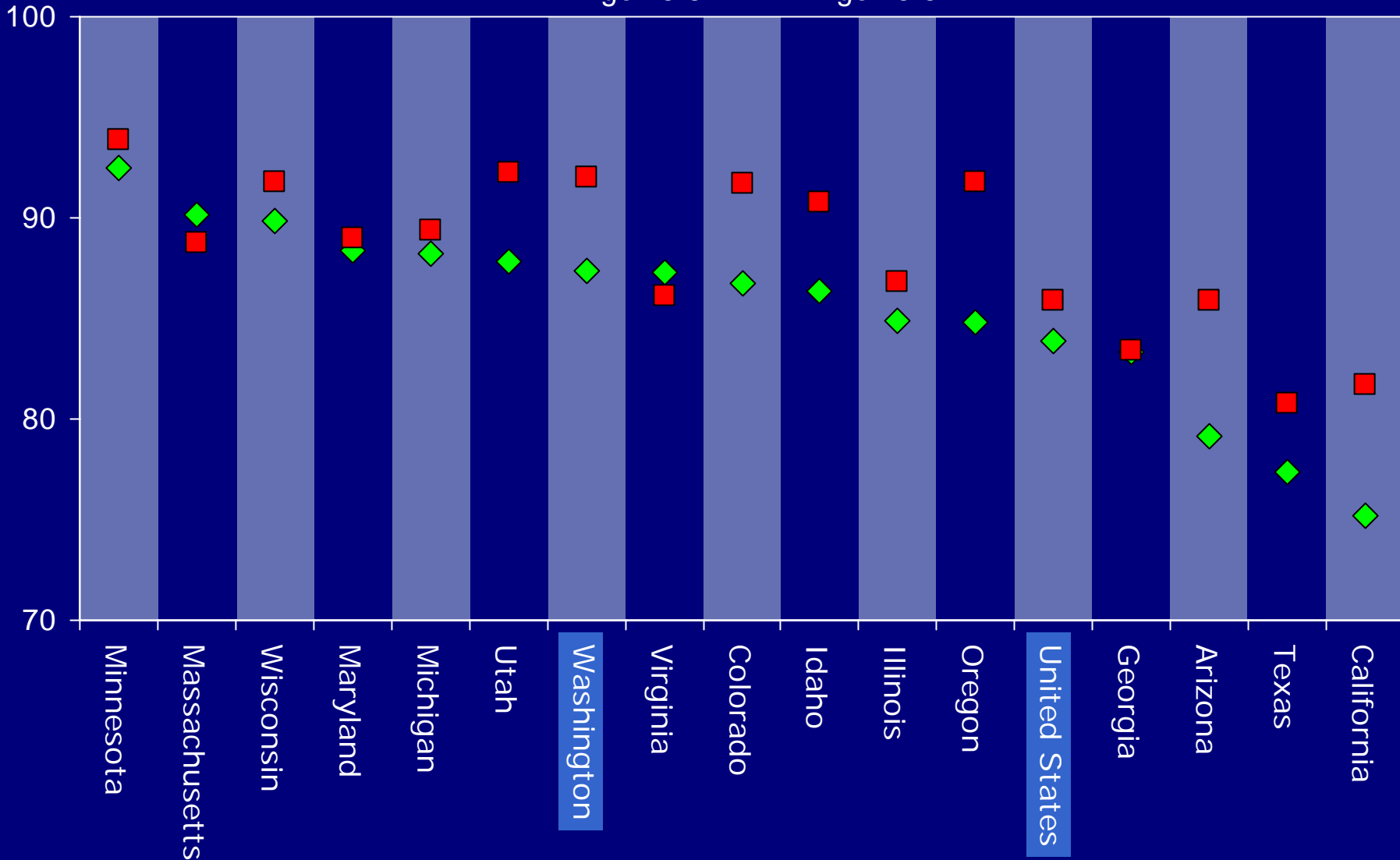


Note: Washington data are for the year 2000.

Source: OECD; U.S. Census Bureau

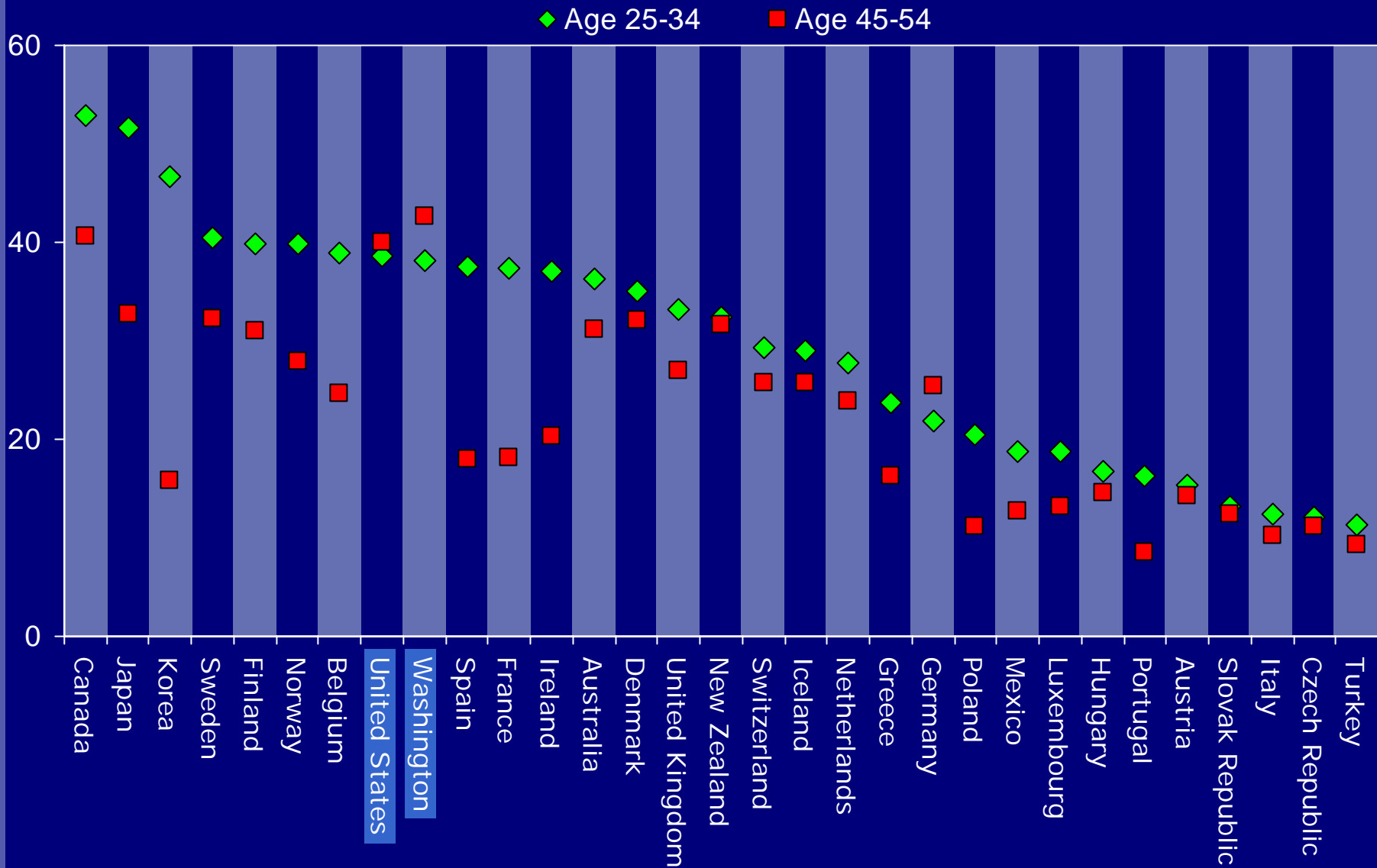
Percent of Adults with a High School Diploma, 2000

◆ Age 25-34 ■ Age 45-54



Source: U.S. Census Bureau, 2000 Census

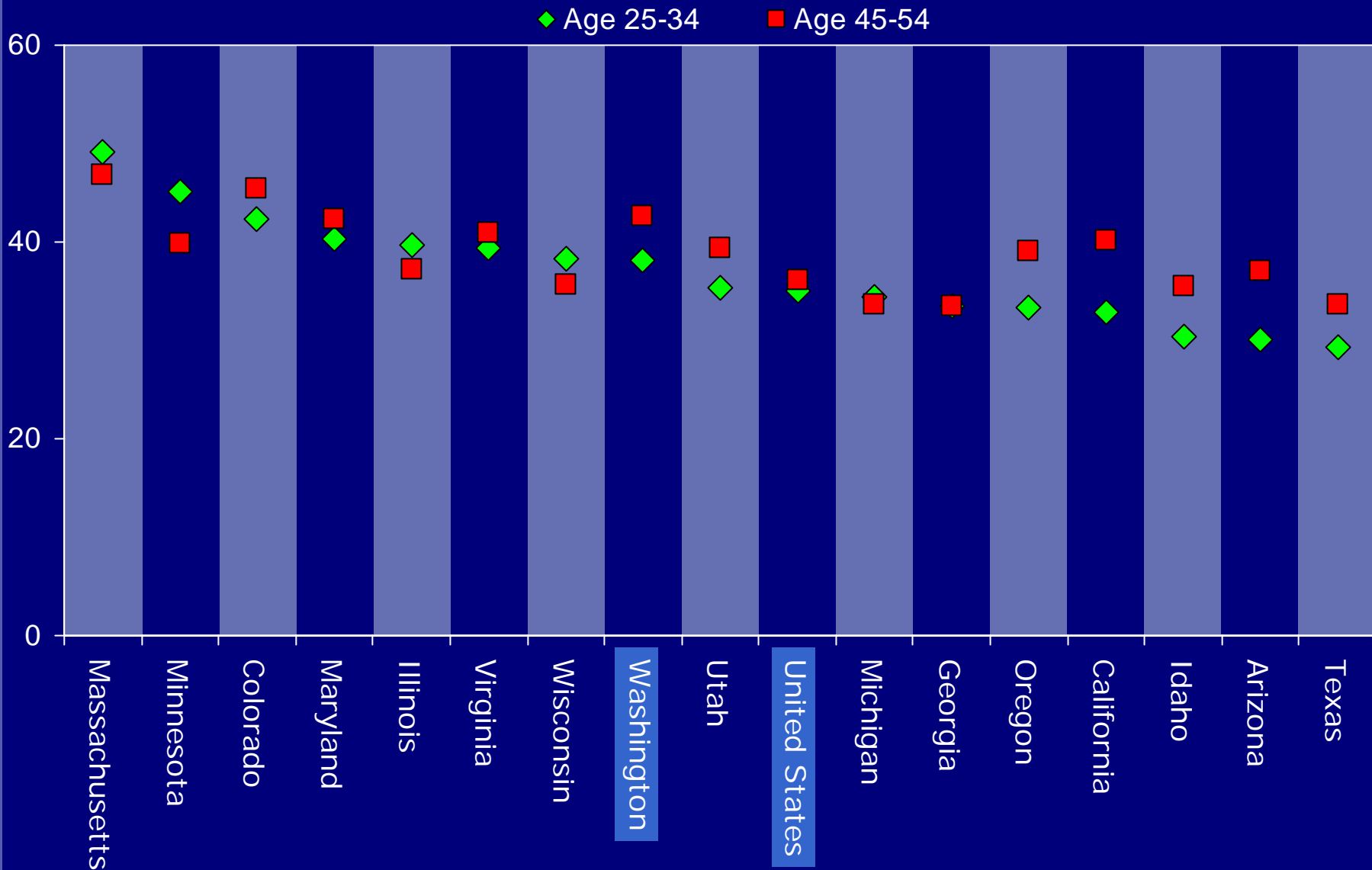
Percent of Adults with an Associate Degree or Higher, 2003



Note: Washington data are for the year 2000.

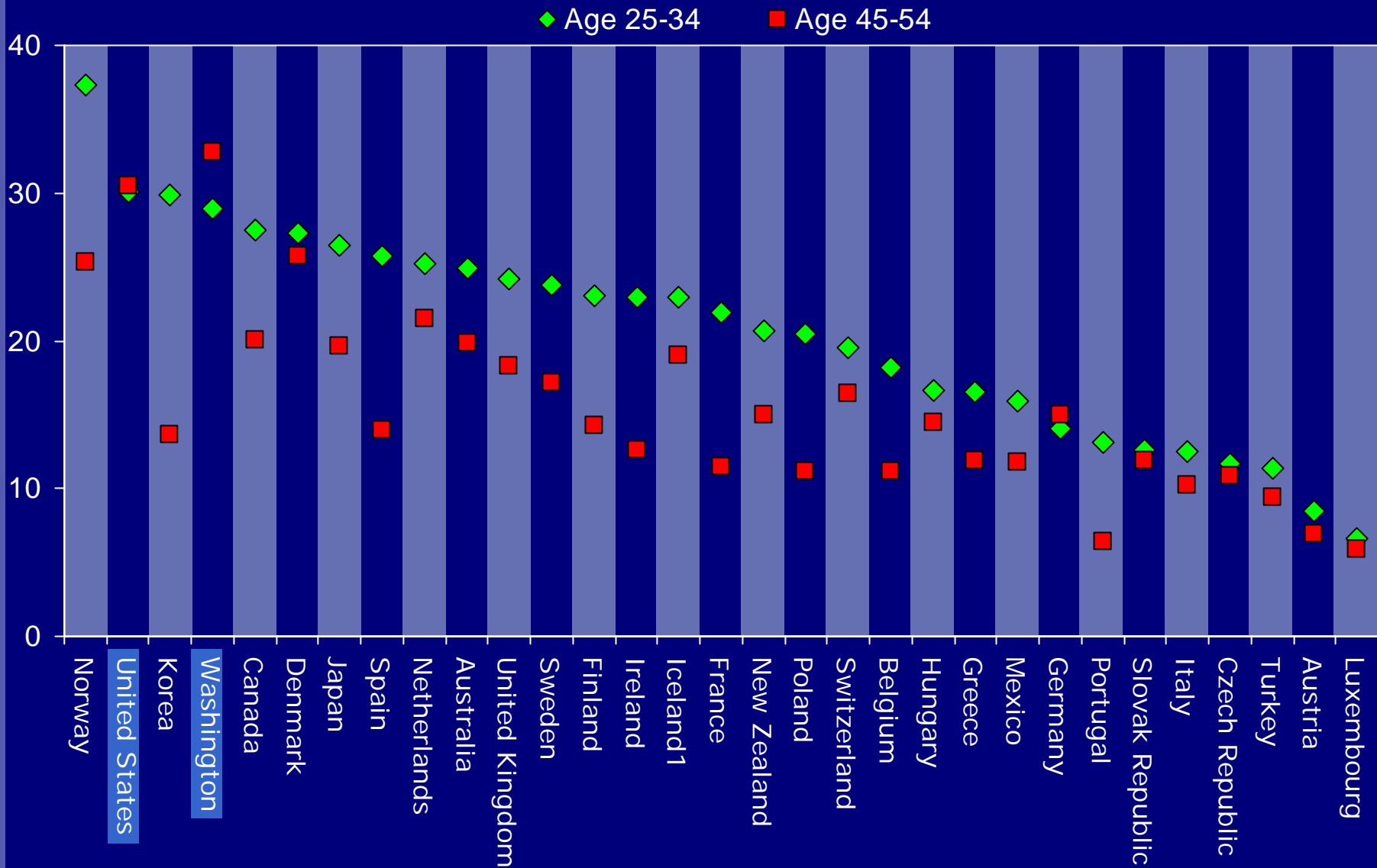
Source: Organisation of Economic Co-operation and Development (OECD); U.S. Census Bureau

Percent of Adults with an Associate Degree or Higher, 2000



Source: U.S. Census Bureau, 2000 Census

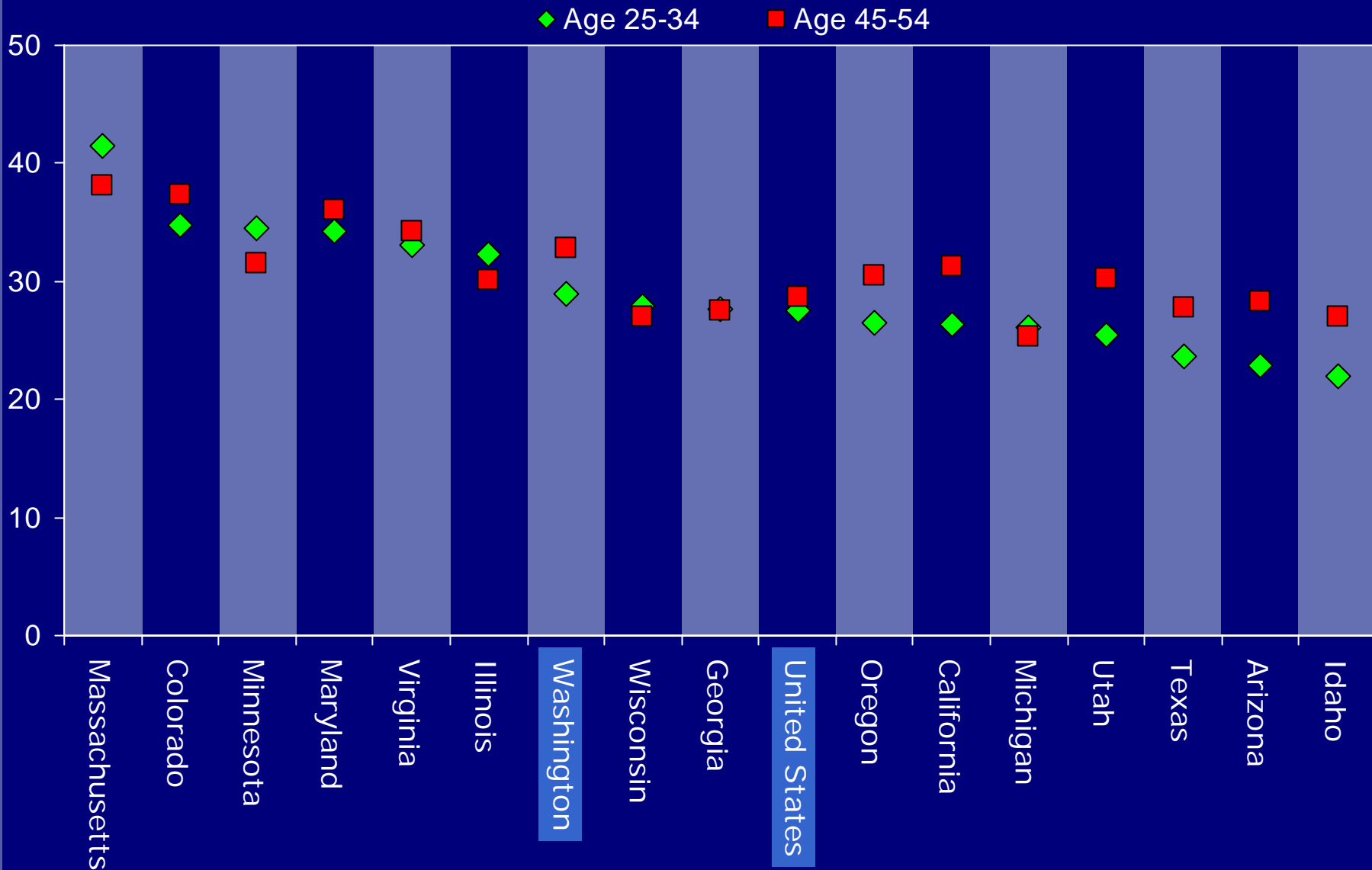
Percent of Adults with a Bachelor's Degree or Higher, 2003



Note: Washington data are for the year 2000.

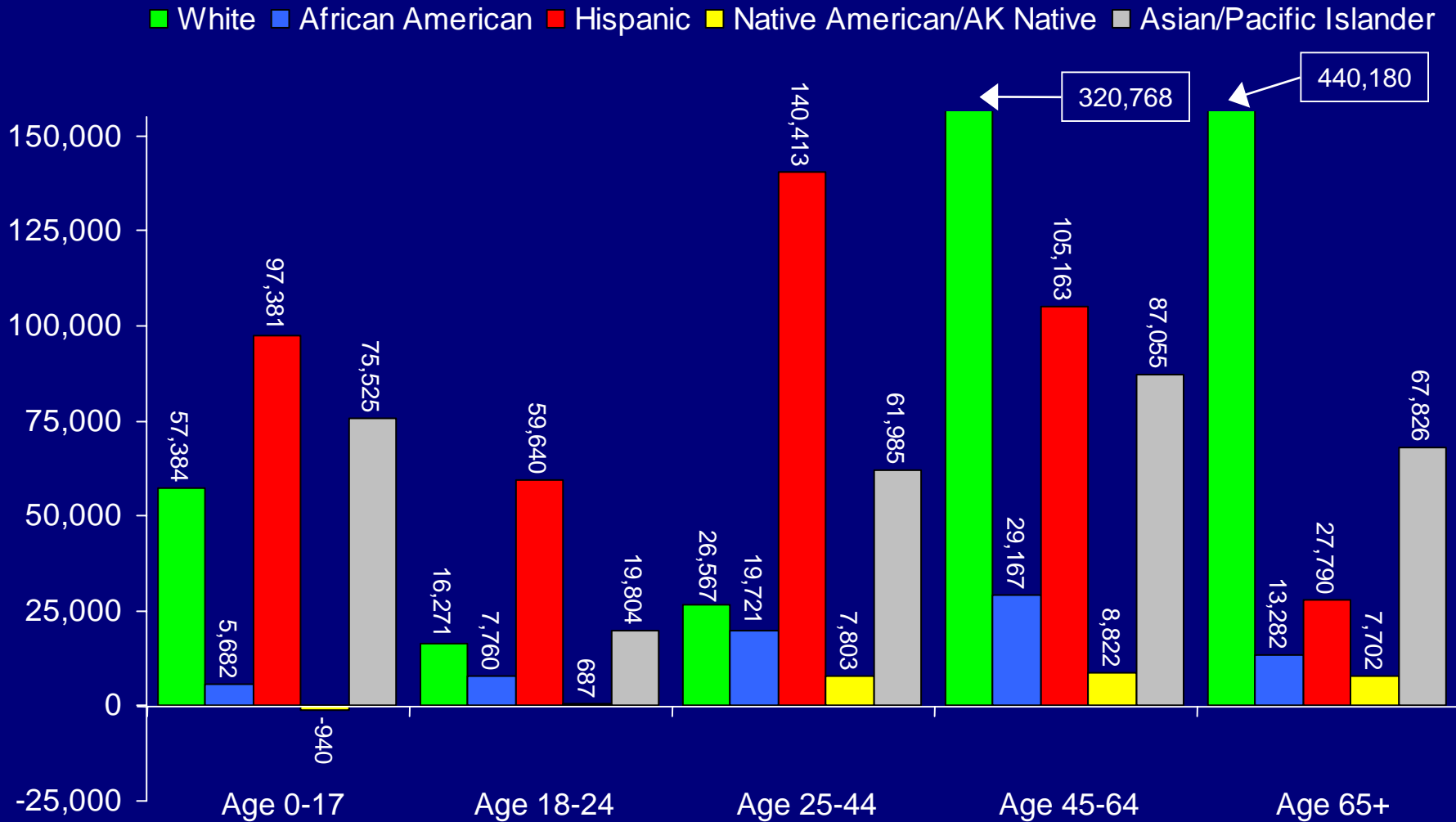
Source: OECD; U.S. Census Bureau

Percent of Adults with a Bachelor's Degree or Higher, 2000



Source: U.S. Census Bureau, 2000 Census

Projected Change in Washington Population by Age and Race/Ethnicity, 2000-20

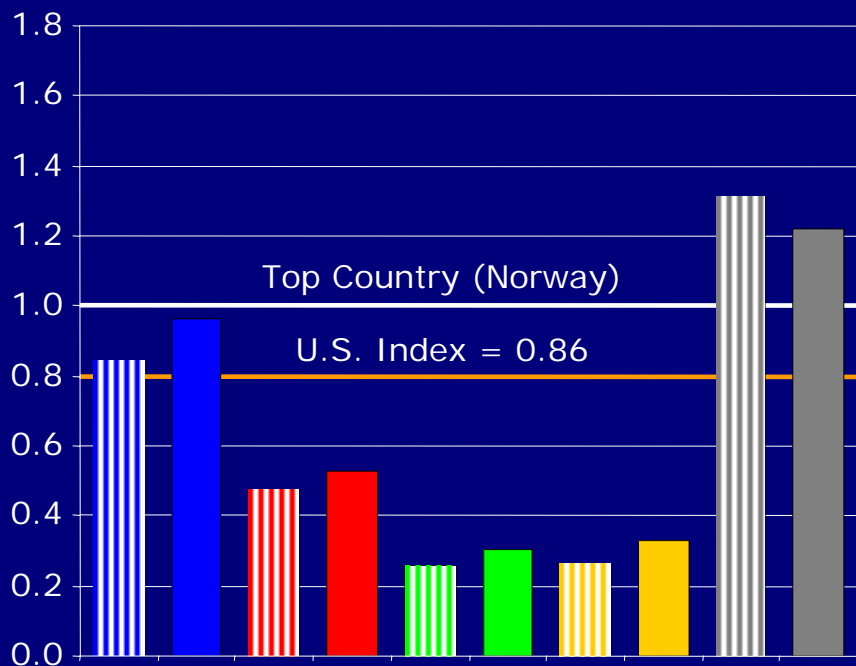


Source: Office of Financial Management, State of Washington

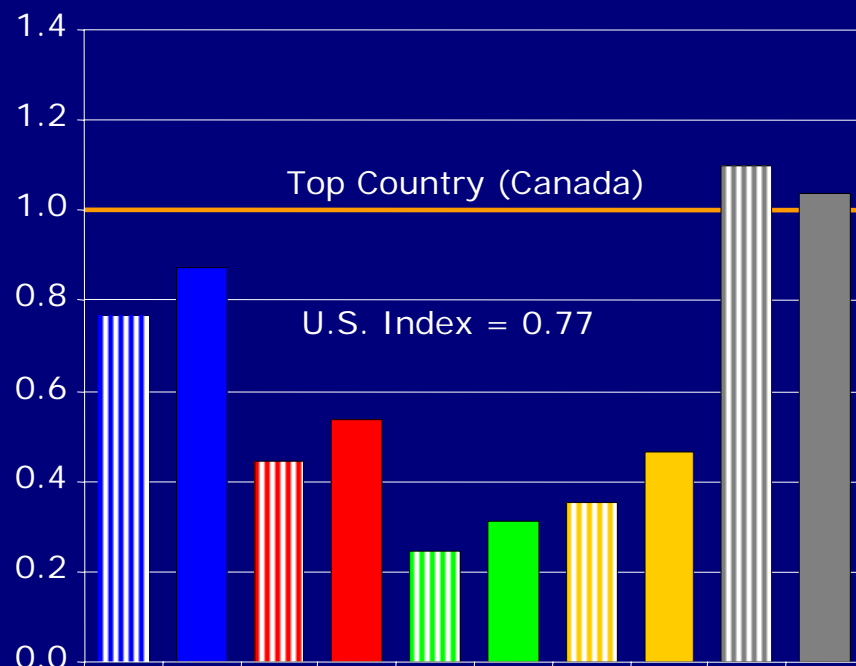
Washington Educational Attainment by Gender and Race/Ethnicity, Age 25-34—Indexed to Top Country

White		African-American		Hispanic/Latino		Native American/ AK Native		Asian/ Pacific Islander	
Male	Female	Male	Female	Male	Female	Male	Female	Male	Female

Percent with Bachelor's Degree or Higher



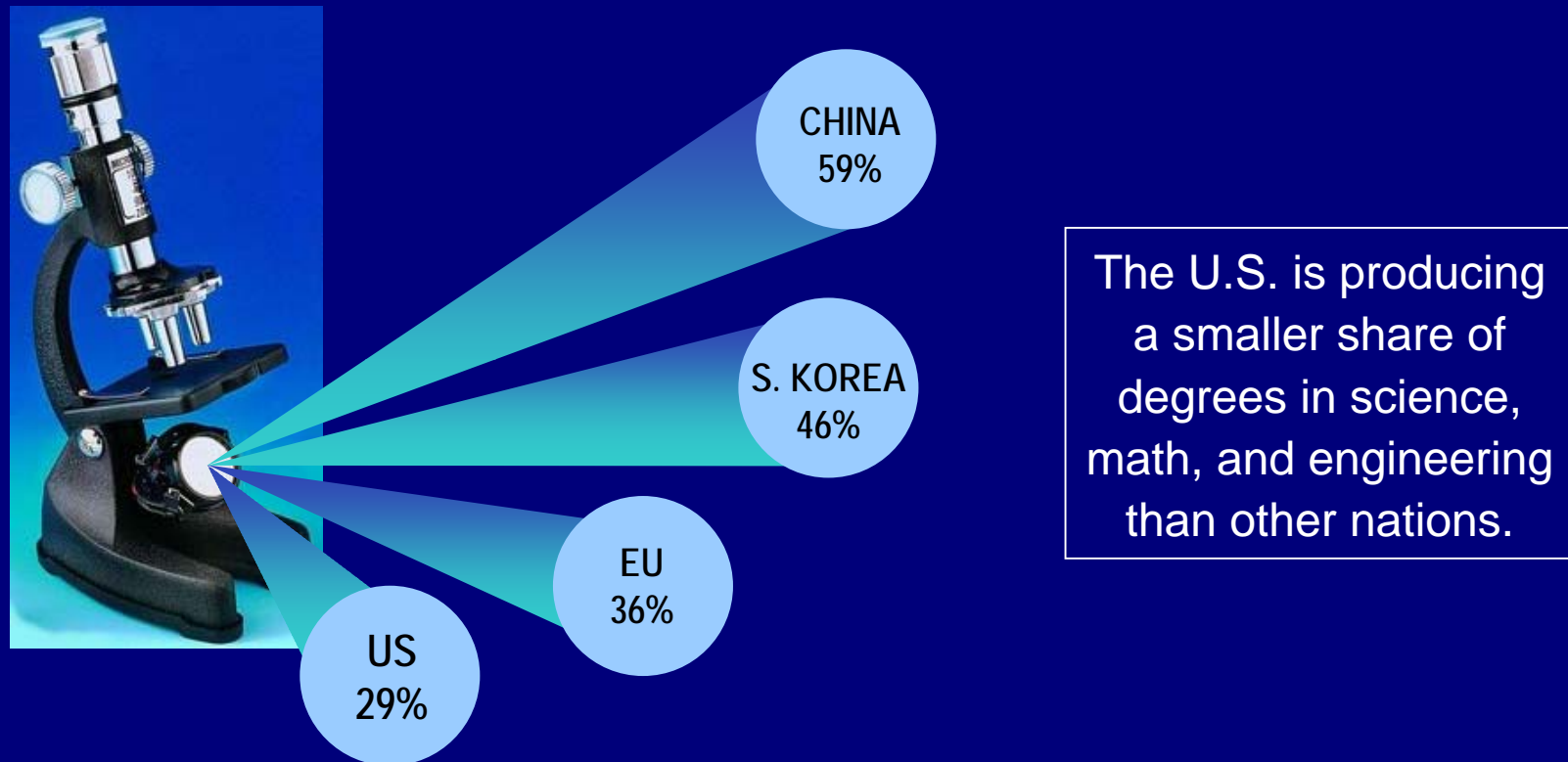
Percent with Associate Degree or Higher



Source: U.S. Census Bureau, Public Use Microdata Samples (Based on 2000 Census); Organisation for Economic Co-operation and Development (OECD)

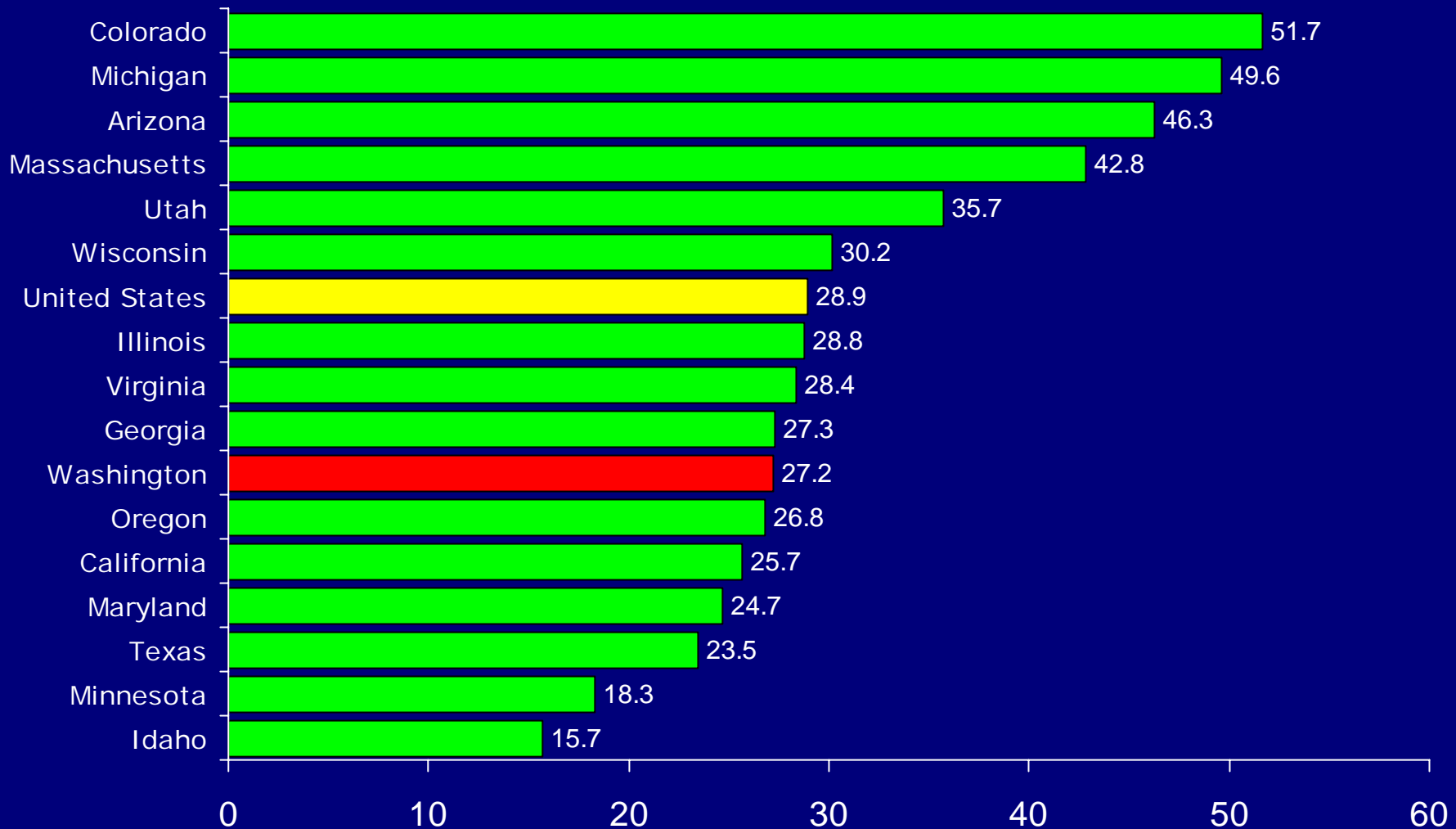
United States Comparative Innovation Capacity

Science, Math, and Engineering Degrees as a Share of All Degrees Awarded



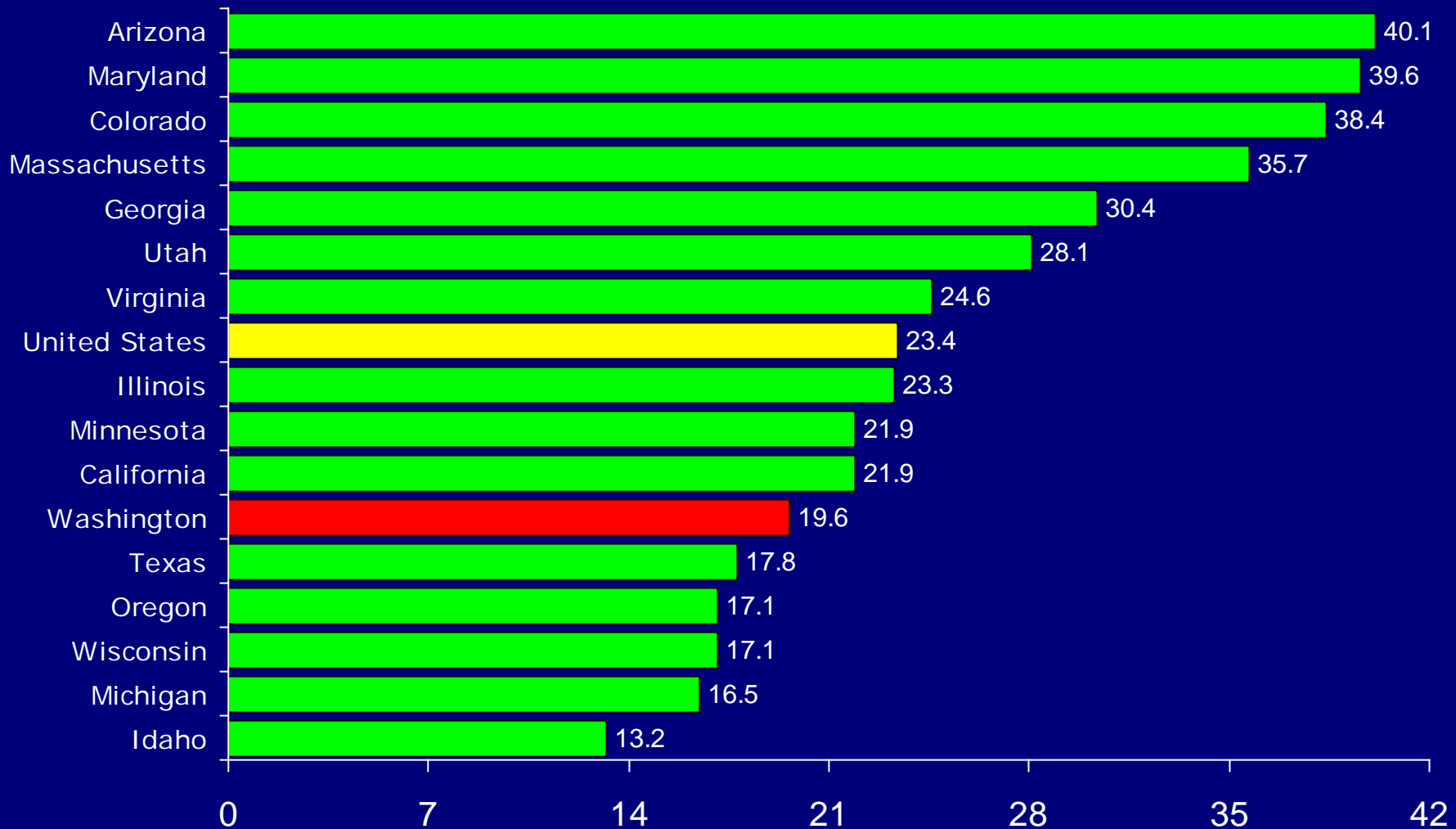
Source: National Science Foundation, 2001; U.S. Department of Education, Integrated Postsecondary Education Data System, 2004

Baccalaureate Degrees Awarded in Engineering per 1,000 High School Graduates Six Years Earlier



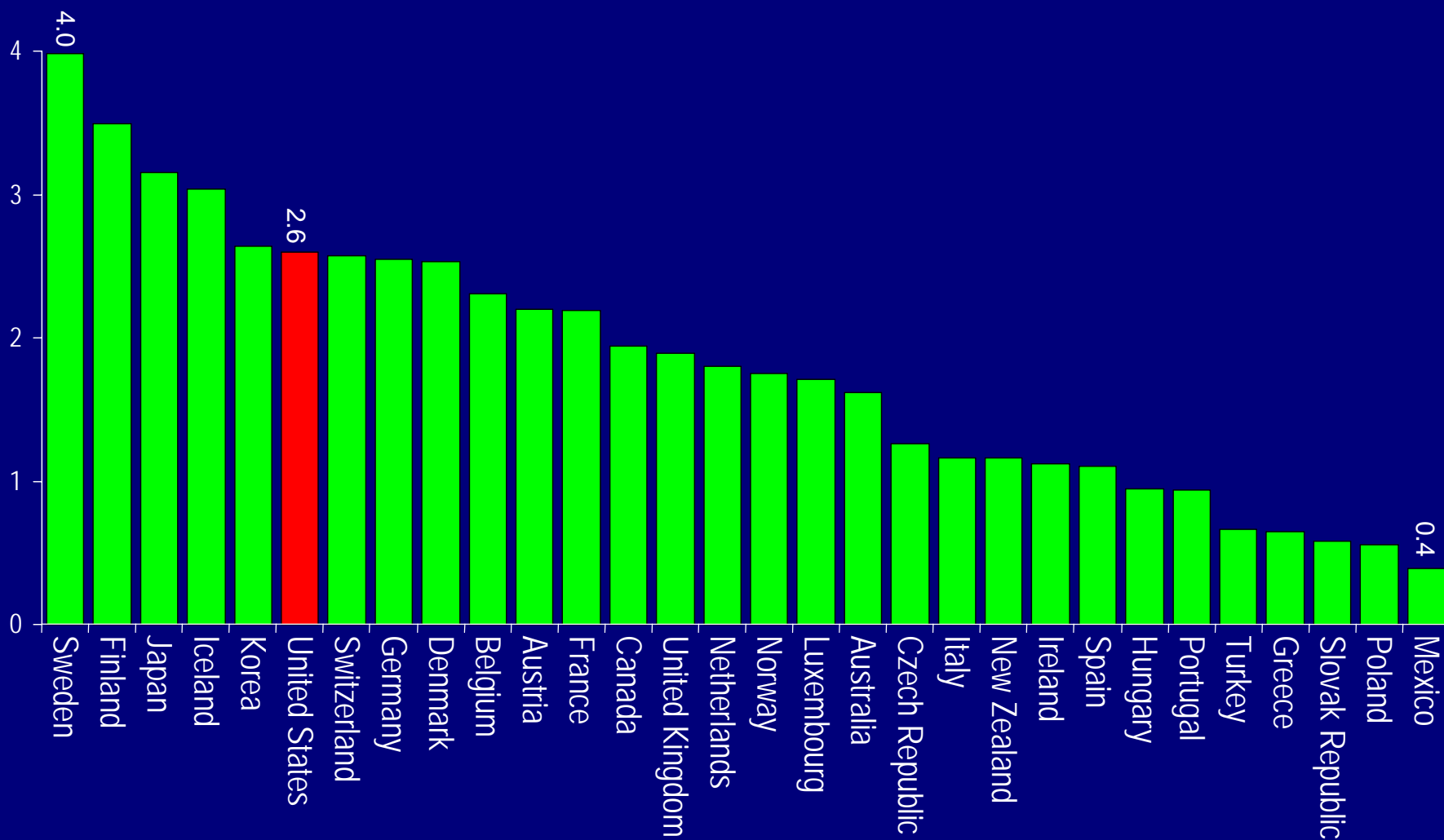
Source: IPEDS 2001-02 Completions; WICHE High School Graduates 1996

Baccalaureate Degrees Awarded in Math and Computer Science per 1,000 High School Graduates Six Years Earlier



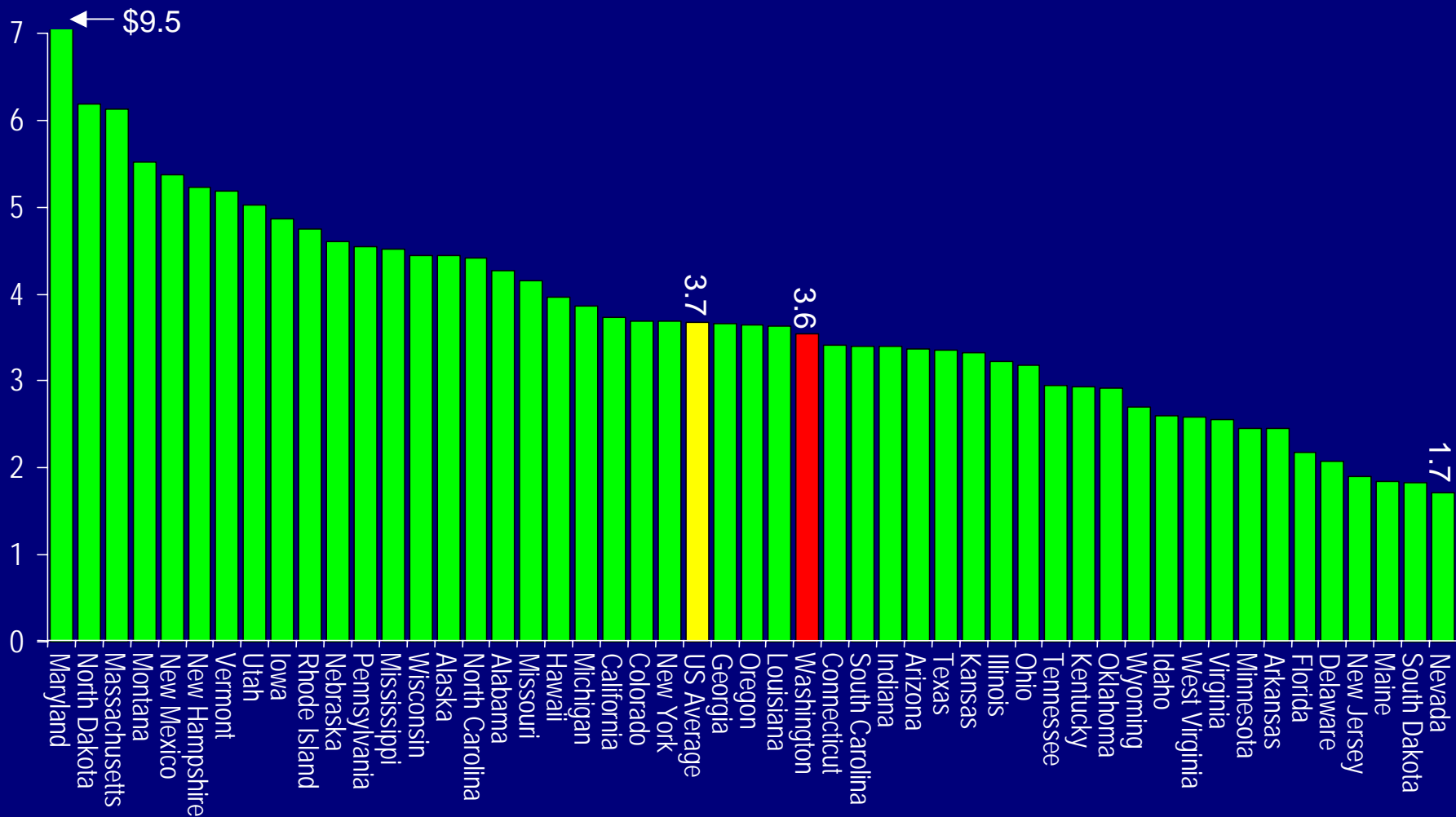
Source: IPEDS 2001-02 Completions; WICHE High School Graduates 1996

Percent of Gross Domestic Expenditure on Research and Development, 2003



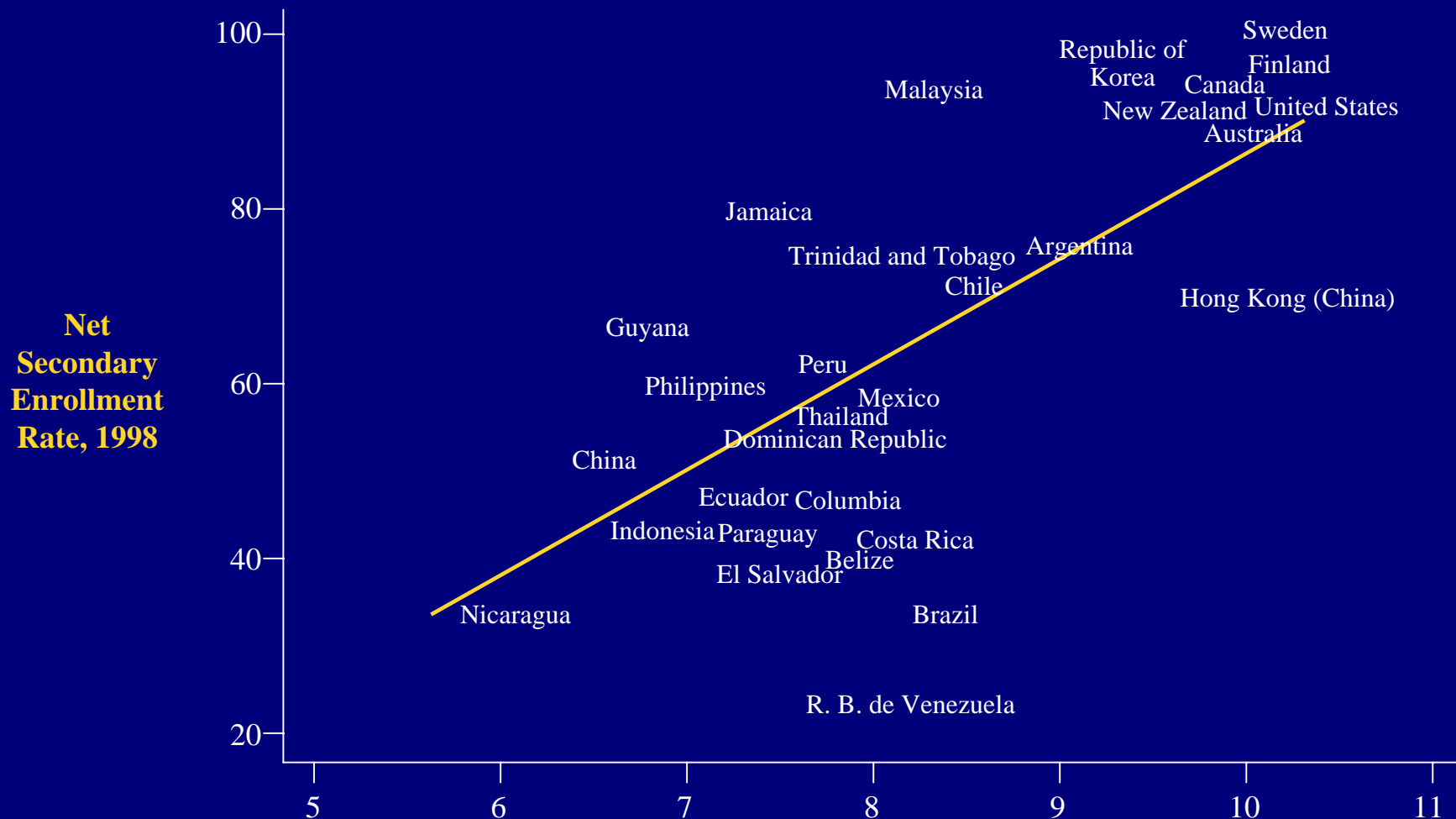
Source: *Main Science and Technology Indicators*, OECD, Paris, 2005

Academic Research and Development Per \$1,000 of Gross State Product, 2003



Source: National Science Foundation, Bureau of Economic Analysis

A Problem in Many LAC Countries—Massive Deficits on Secondary Education



Ferranti, D. et al., *Closing the Gaps in Education and Technology*, Study of Latin America and the Caribbean, World Bank 2003 p. 6

Log of per capita GDP, 1998

What Are Other Nations Doing?

Two Examples:

Ireland

Korea

Ireland

**Excerpts from Presentations by
Higher Education Authority of
Ireland, February 2006**

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Higher Education Authority
An tÚdarás um Ard-Oideachas

Development of the “Celtic Tiger”

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Basic Facts

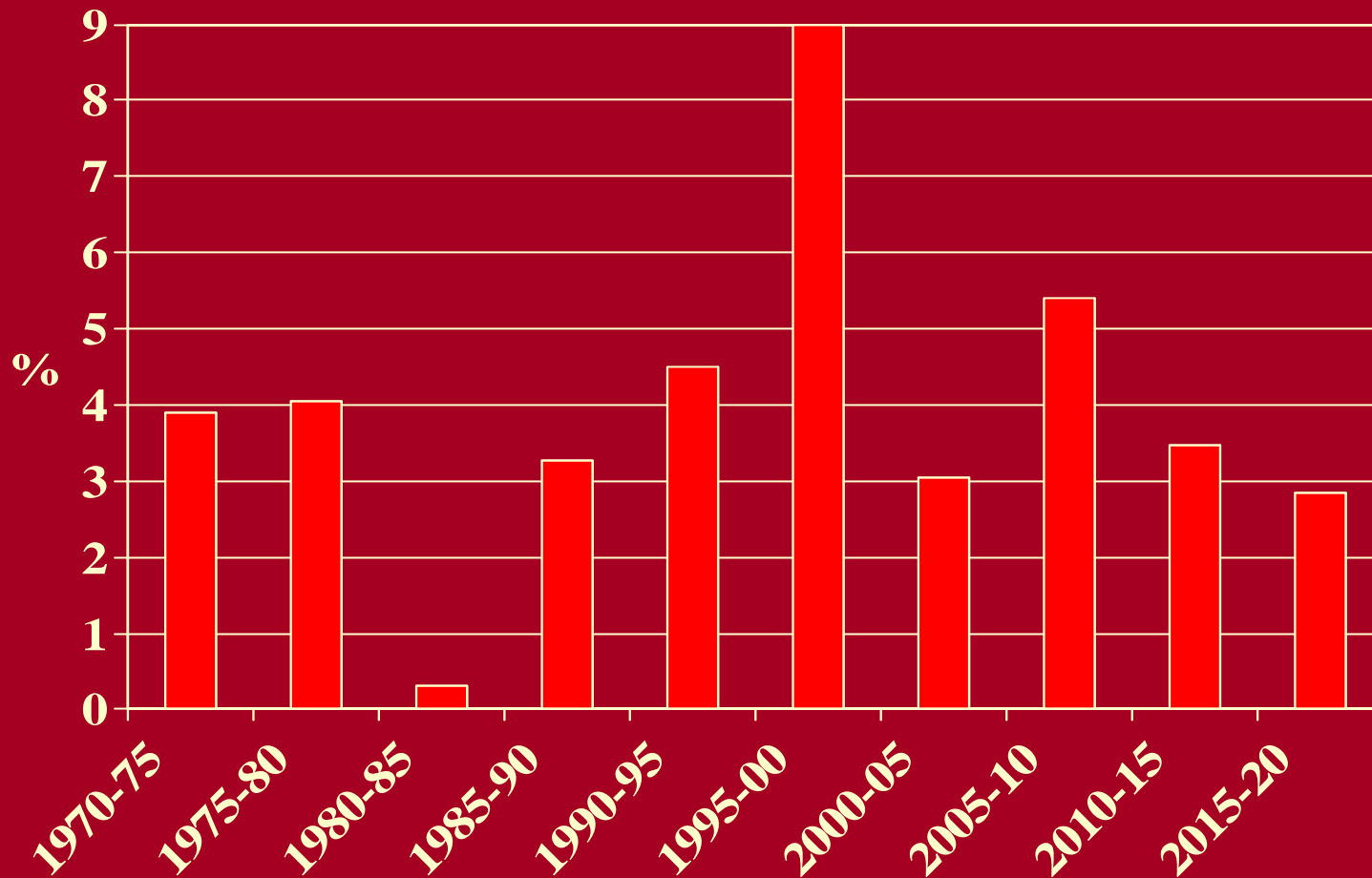
- **Geography: 70,280 sq km**
- **Population: 4,062,235 (2006 estimate)**

Performance Indicators

Economic Performance Indicators	1993	2003
Unemployment %	15.7	4.7
Government debt as a % GNP	93	34
Corporation tax %	10/40	12.5/25
Personal tax % (lower and higher rate)	27/48	20/42
Irish GDP per capita as a % of EU-15 GDP per capita	69	125
Irish GNP per capita as a % of EU-15 GDP per capita	75	101

Source: Department of Finance and AMECO 2004

Average Growth in Real GNP



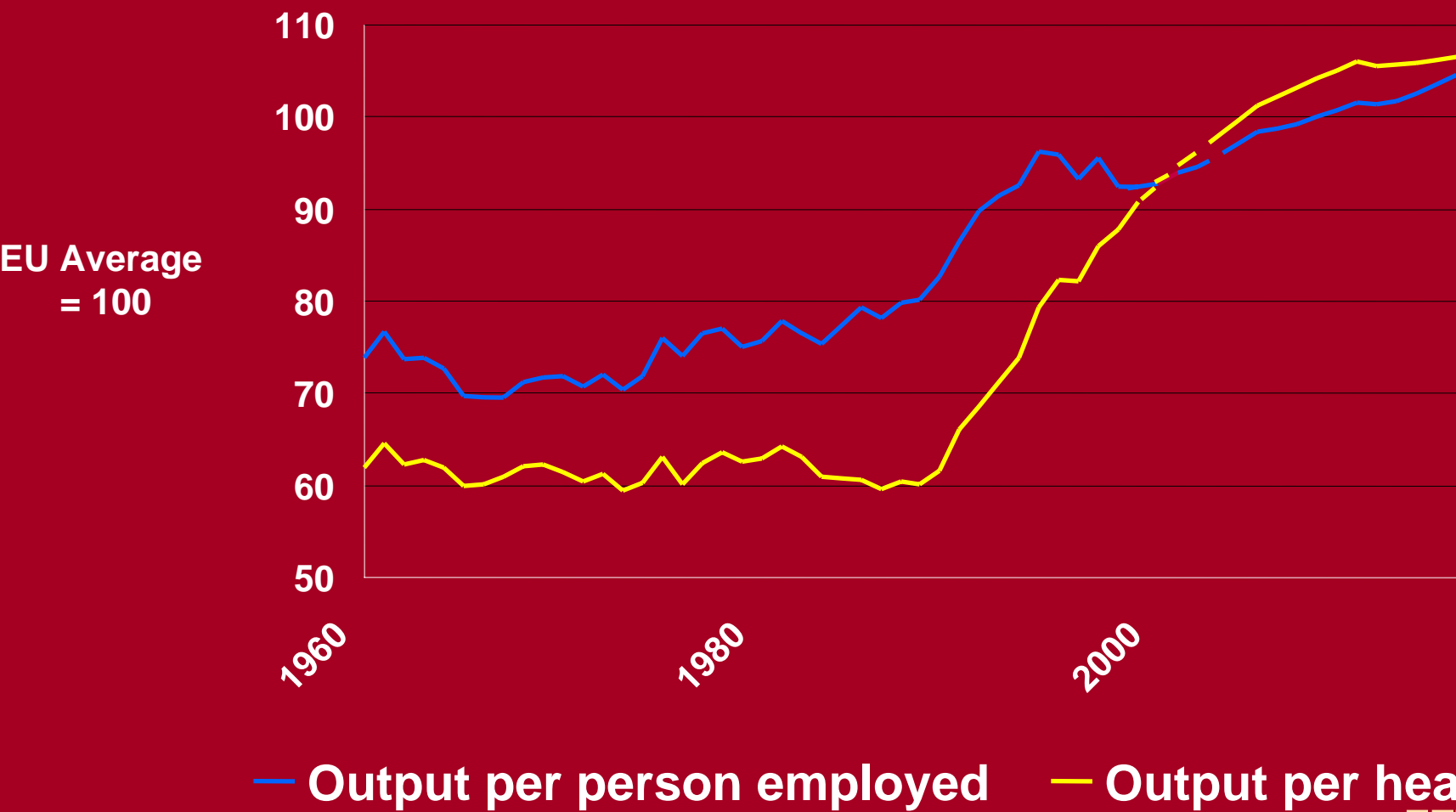
Source : D. McCoy, ESRI

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Relative Standard of Living

Irish Output relative to EU



Source : D. McCoy, ESRI

Dynamics of Economic Success

- **Skilled people and quality graduates**
 - Historical investment in education (1960s)
 - Returning graduates of the 1980s
- **Competitive operating environment**
- **Low corporate tax rate (12.5%)**
- **Success in attracting foreign direct investment**
- **Full participation in EU**
- **English speaking**
- **Demographic profile facilitated pace of**

Policy Focus for the Future

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Stages of Economic Development

**Factor-Driven
Economy**

Input Cost

**Investment-Driven
Economy**

Efficiency

**Innovation-Driven
Economy**

Unique value

**Key Transition
(Paradigm Shift)**

Focus for the Future

“Ireland must build technological and applied research and development capability to support the development of high-value products and services.”

Entreprise Strategy Group, July 2004

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Focus for the Future

“Ireland’s determination to move from being a technology-importing, low cost economy to an innovation-based, technology-generating society requires that Irish tertiary education and research, and innovative indigeneous enterprises, have to become the new drivers of economic development and of the country’s international competitiveness.”

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Focus for the Future

“In a knowledge-based economy, the requirement for higher education graduates and post-graduates will increase and if we are to compete effectively, the per capita proportions of graduates and post-graduates in Ireland should compare favourably with our competitor countries”

**Higher Education is the means
through which Ireland can
become an innovation society**

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Two drivers underpin the requirement for greater participation in higher education

- Meeting economic demands
 - Needs of economy
 - Individual demand
- Broadening access to higher education

How can we measure progress?

Government benchmarking / international competitiveness target

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Benchmarking Target

Graduation Rates								
<i>Diploma/Certificate</i>			<i>Degree</i>			<i>Advanced Research Degrees</i>		
<i>Rank</i>	<i>Country</i>	<i>Rate</i>	<i>Rank</i>	<i>Country</i>	<i>Rate</i>	<i>Rank</i>	<i>Country</i>	<i>Rate</i>
1	Japan	26.7	1	Australia	45.4	1	Sweden	2.8
2	Switzerland	18.9	2	Finland	45.4	2	Switzerland	2.6
3	France	18.5	3	Poland	41.5	3	Germany	2.0
4	Spain	13.8	4	Iceland	41.2	4	Finland	1.9
5	Ireland	12.7	5	Hungary	37.2	5	Austria	1.7
6	United Kingdom	11.5	6	United Kingdom	35.9	6	United Kingdom	1.6
7	Germany	9.8	7	Japan	33.8	7	France	1.4
8	Denmark	9.5	8	Spain	33.5	8	Australia	1.3
9	United States	8.8	9	Sweden	32.7	9	Netherlands	1.3
10	Iceland	6.4	10	Ireland	31.1	10	United States	1.3
11	Norway	4.8	11	France	24.8	11	Belgium	1.1
12	Czech Republic	4.5	12	Slovak Republic	23.0	12	Norway	1.1
13	Sweden	3.8	13	Italy	22.7	13	Spain	1.0
14	Finland	3.7	14	Germany	19.2	14	Denmark	0.9
15	Slovak Republic	2.7	15	Austria	18.0	15	Korea	0.9
16	Hungary	1.3	16	Switzerland	17.9	16	New Zealand	0.9
17	Italy	0.9	17	Czech Republic	14.9	17	Ireland	0.8
Positioning								
5 th out of 17			10 th out of 17			17 th out of 26		
Required Position for Top Quartile Performance								
4 th			4 th			6 th		

Source: Education at a Glance, OECD Indicators 2004 (data refers to 2002)

Needs of Economy

- **Skills needs (ICT, teaching, health, financial services)**
- **FÁS / ESRI study of labour force projections to 2010**
 - **Projected needs: 300,000**
 - **Steady state output 200,000 (maximum)**
 - **How to fill the resultant gap?**

Broadening Access

- **Three main target groups**
- **Extensive policy analysis and Government targets in respect of each group**
 - **Report of the Action Group on Access to Third Level Education**
 - **Points Commission – targets of 15% by 2006 and 25% by 2015 in respect of mature students**
- **Role of National Office for Equity of Access to Higher Education in future**

Economic and Social Policy

Synergy between economic and social factors underpinning increased participation in higher education

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Is this realistic?

- **67% admission rate by 2015?**
 - **Leading OECD knowledge societies have already exceeded that rate, e.g. Sweden (75%), Australia (77%), Finland (71%), New Zealand (66%)**
 - **Ireland is already in “catch up”**

Challenges

- **Investment and financing**
- **Capital infrastructure**
- **Maintain quality of education and research**
- **Addressing policy inconsistencies**
 - **Participation needs Vs actual benchmarks**

Third-level Institutions

- **7 universities**
- **colleges of education**
- **Dublin Institute of Technology**
- **13 Institutes of Technology (former Regional Technical Colleges)**
- **private institutions**

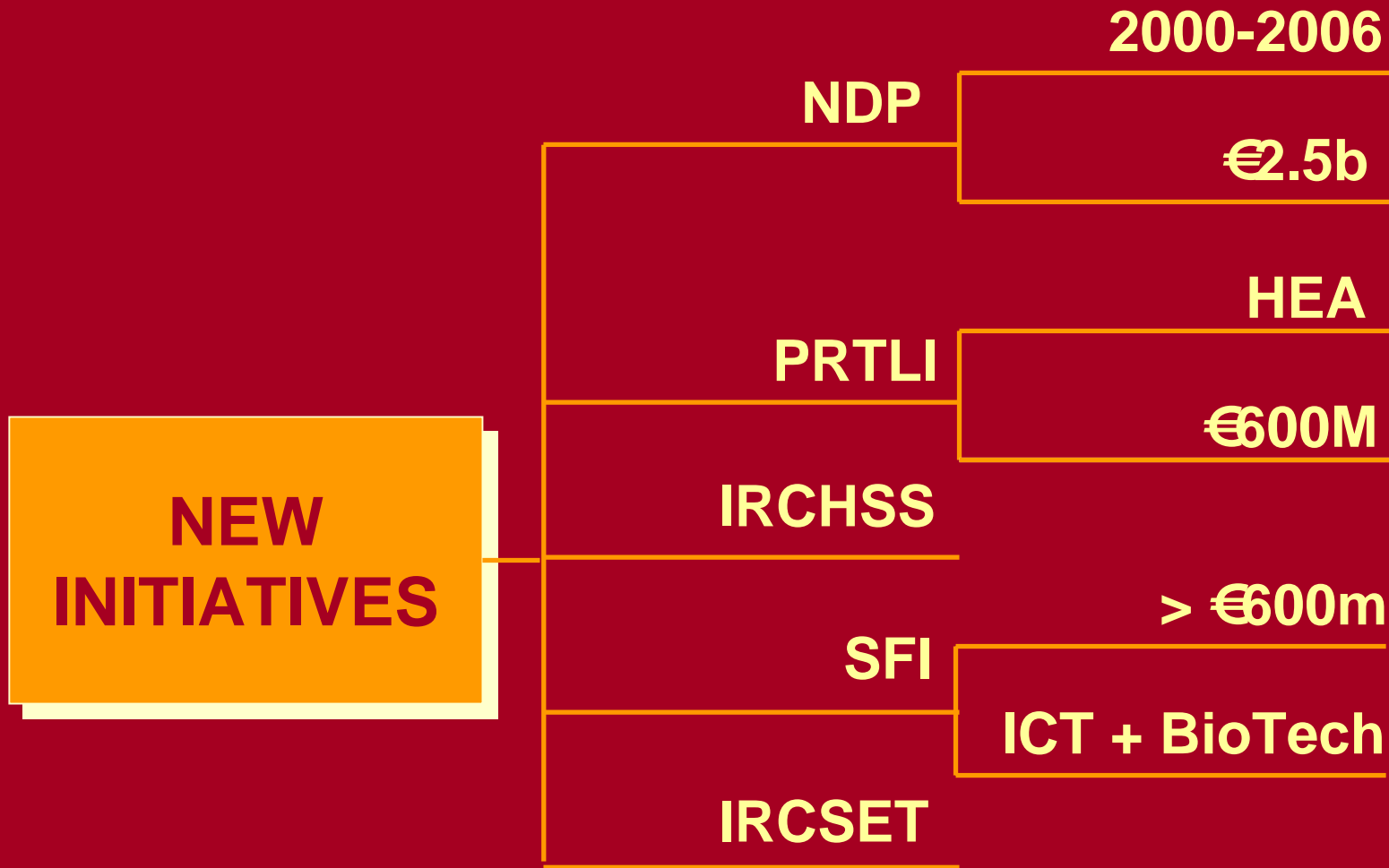
Figure 1.
Rates of Admission by County



Footnote:
The admission rates shown are those calculated on the basis of admission to colleges in the Republic of Ireland. However, where the rate of admission is altered by more than one percentage point, by the inclusion of students admitted to colleges in Northern Ireland, the consequent increases are shown in parentheses.

Structure of Higher Education: Binary System

Developments in higher education, particularly over the past 20 years, have been based on a differentiated system of third level education.



NDP: National Development Plan

IRCHSS: Irish Research Council for Humanities and Social Sciences

SFI: Science Foundation Ireland

IRCSET: Irish Research Council for Science, Engineering and TEchnology

National Development Plan

Over the period 2000 – 2006, a total of €2.5 billion was allocated to research spending under the Government's National Development Plan (NDP) for this period.

Science Foundation Ireland (SFI)

- **Established on a statutory basis under the Industrial Development (Science Foundation Ireland) Act, 2003**
- **SFI provides awards to support scientists and engineers working in biotechnology and information and communications technology development**

Investment commitments - SFI

- **Responsible for for administering Ireland's Technology Foresight Fund.**
- **Under the NDP this fund has a budget of €646 million to invest from 2000 - 2006**
- **More than €200m has been committed in five main programmes to date**

**Excerpts from “Higher Education Reform
in South Korea:
Policy Responses to a Changing World”**

**Moscow, July
5, 2005**



Gwang-Jo Kim, Ed.D
**Deputy Ministry of Education & Human Resources
Development**
Republic of Korea

South Korea at a Glance



- About 100 thousand sq kms
- 48 Million People
- 7 metropolitan cities & 9 provinces
- GDP Per Capita \$20,400 US (2005)
- Unemployment: 3.5% in 2004 (Youth unemployment 7.9%)

Brief history and culture

- **Brief History** (3 Kingdoms)(BC 1C-AD 7C) – Shilla(7-10C) - Koryo(10-14C)

Economic development

	1970	1980	1990	1997	1998	2000	2004
Population (Millions)	32	38	43	46	46	47	48
GNI per capita (US\$)	650	2,324	7,751	10,363	6,843	9,675	12,646
Unemployment rate (%)	4.4	5.2	2.4	2.6	6.8	4.1	3.5
Labor force (Millions)	10	14	19	21	21	22	23 (2003)
Labor force Participation rate (%)	47.6	59.0	60.0	62.2	60.5	60.7	61.4 (2003)

Economy and education ('60s-'70s)

	1960s – mid-1970s
Economy	<ul style="list-style-type: none">■ Take-off & export-driven in '60s; export acceleration in early '70s
Major Industry/ Exports	<ul style="list-style-type: none">■ Light manufacturing goods (clothing, textile, shoes, etc)■ Electronic goods (television, radios)
General Education	<ul style="list-style-type: none">■ Expansion of primary & lower secondary education■ School equalization policy
VET/HE	<ul style="list-style-type: none">■ Emphasis on VET(late '60s)■ Separate VET track■ Limited access to university education

Economy and education ('70s-'80s)

	mid-1970s – 1980s
Economy	<ul style="list-style-type: none">■ Structural adjustments in late '70s: from imitation to innovation in '80s
Major Industry/ Exports	<ul style="list-style-type: none">■ Heavy & Chemical industry■ Iron industry, shipyard, precision manufacture
General Education	<ul style="list-style-type: none">■ Expansion of upper secondary education
VET/HE	<ul style="list-style-type: none">■ Strengthening Junior College & Open University■ Expansion of HE (Graduation enrollment quota)

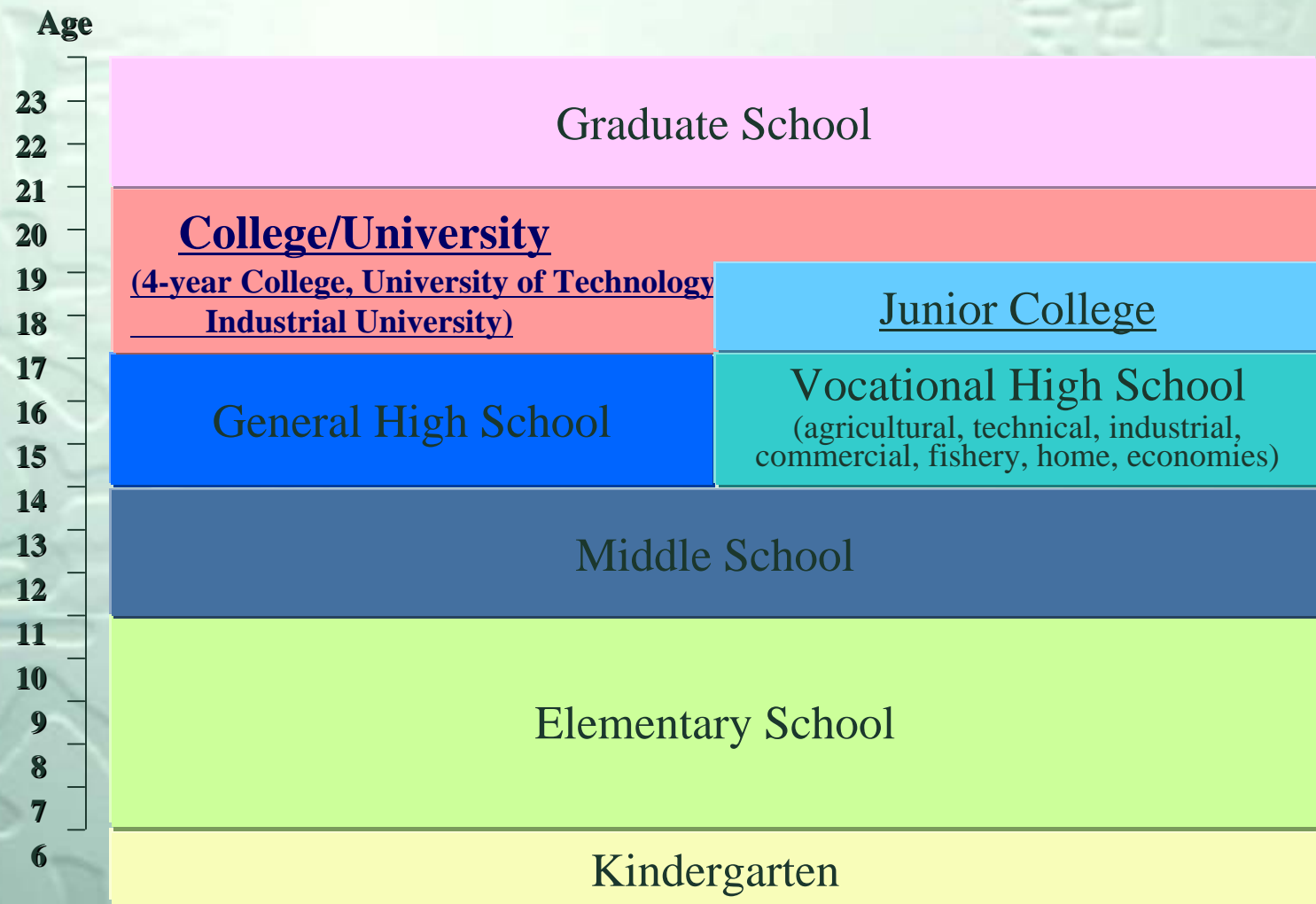
Economy and education ('90s ~)

	1990s through the present
Economy	<ul style="list-style-type: none">■ National competitiveness in early '90s; Knowledge-based economy in mid-'90s
Major Industry/ Exports	<ul style="list-style-type: none">■ Semiconductor, Information & communication technology■ Computer, Cellular phone, Memory chips
General Education	<ul style="list-style-type: none">■ Establish life-long learning infra-structure■ Promote deregulation & diversity
VET/HE	<ul style="list-style-type: none">■ Curriculum integration & School diversification■ Employment Insurance system■ Cyber university, credit bank system, etc.

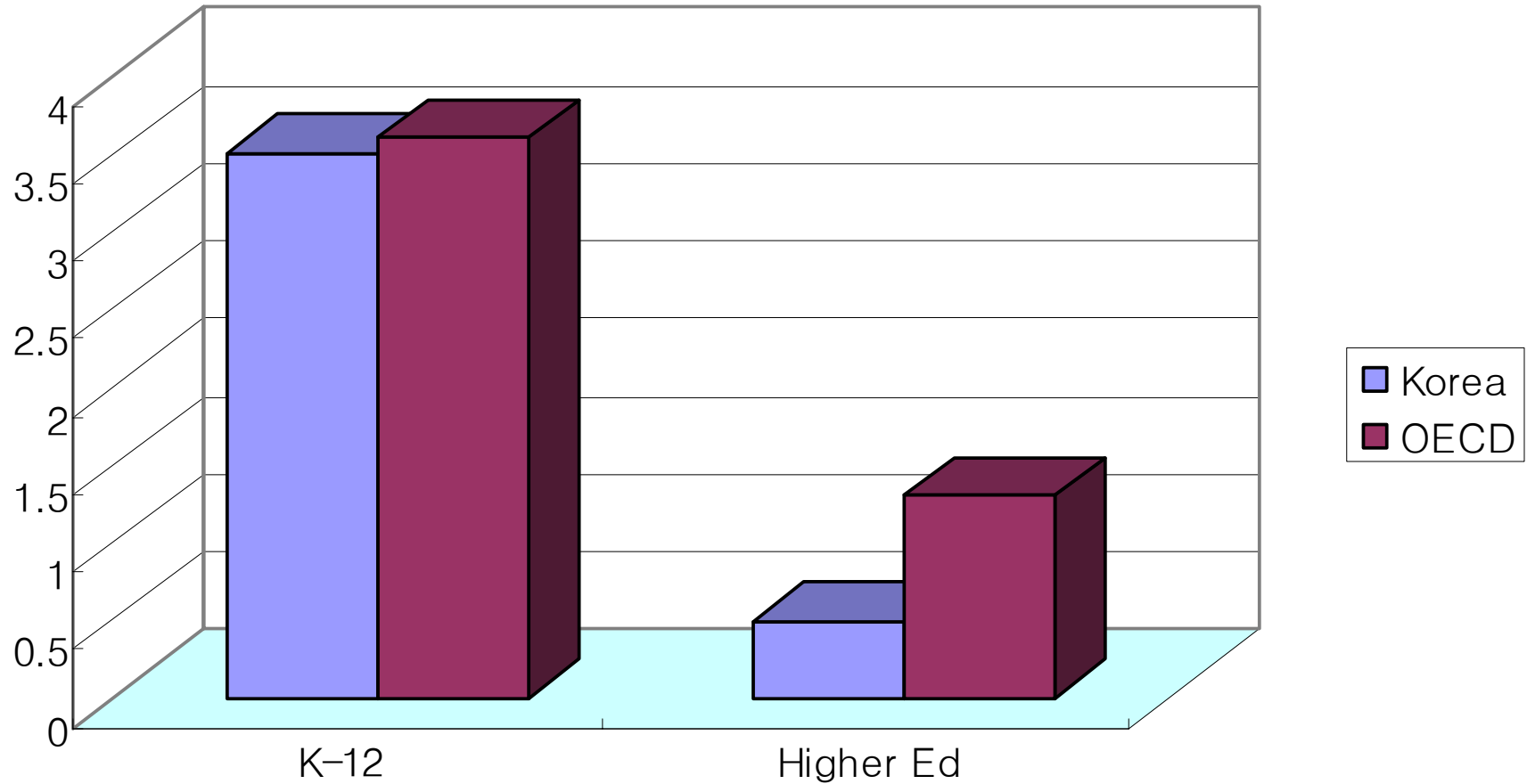
The background features a light blue wave graphic at the top, transitioning into a darker blue area with a faint, semi-transparent globe. The globe shows the outlines of continents and a grid of latitude and longitude lines.

STATE OF HIGHER EDUCATION

Formal education system



Public educational expenditures (% GDP)



(Source : Education at a Glance, 2004)

Higher education sector is divided into the following segments :

■ Universities

- 182 universities (1.8 million enrolments each year)

■ Polytechnics

- 18 Industrial Universities (200,000 enrolments each year)
- 1 technical college (196 enrolments)

■ Junior Colleges

- 158 junior colleges (900,000 enrolments each year)

■ Others

- 1 Air & corr. University (300,000 enrolments each year)
- 17 Cyber Colleges & Universities (40,000 enrolments each year)

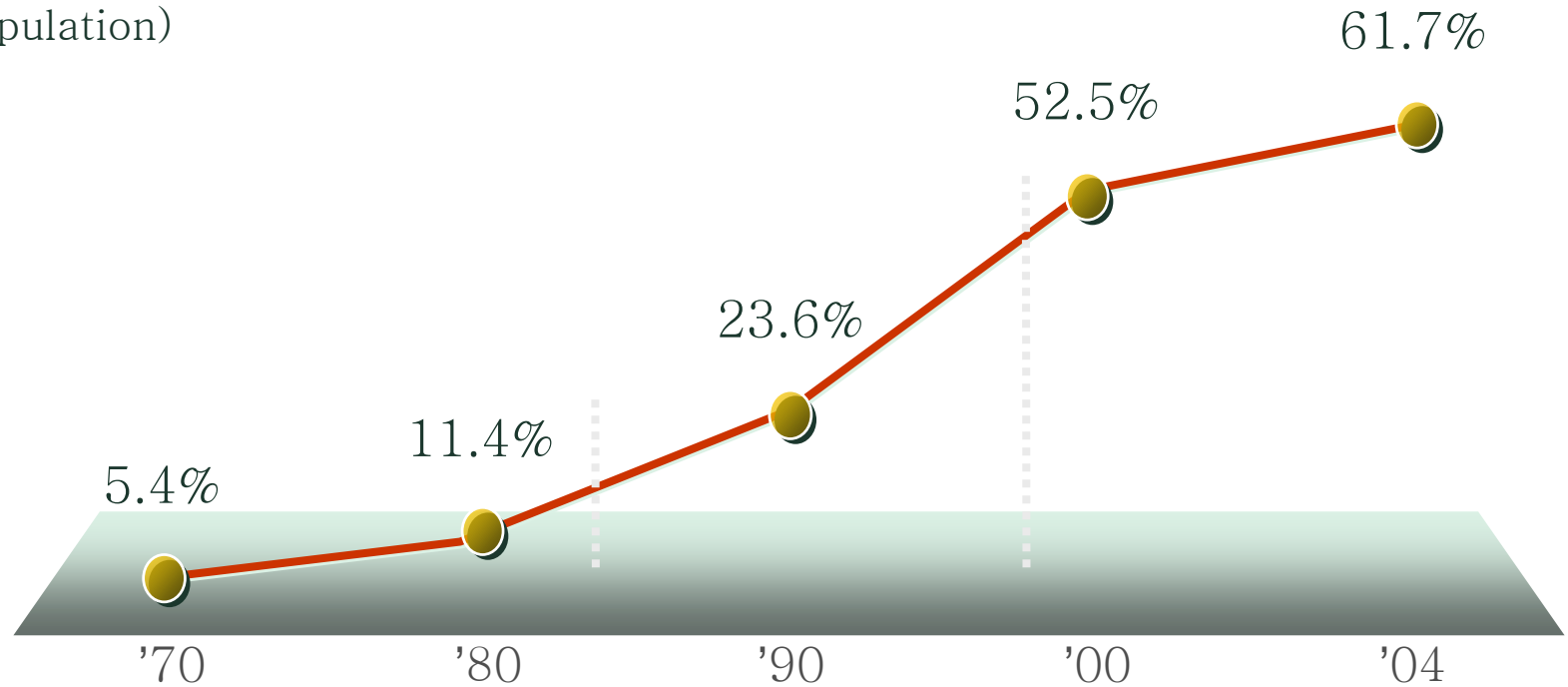
University Graduates by Field of Study (%)

* Source : Education at a Glance (OECD Indicators, 2002)

	Education	Humanities & Art	Social Sciences, Business, Law	Services	Engineering, Manufacturing	Agriculture	Health & Welfare	Physical sciences
Korea	5.2	21.4	22.3	2.9	27.4	2.6	7.1	3.5
U.S.A.	13.2	14.4	41.4	3.5	6.3	2.3	9.6	1.4
Germany	8.0	14.7	27.4	1.8	17.6	1.9	15.2	5.0
Hungary	20.0	8.7	38.7	8.4	9.1	3.7	8.5	0.7
Poland	11.5	6.5	40.0	3.6	7.3	1.7	1.9	1.2

Expansion of higher education

※ The Percentage of Higher Education Attendance = (enrolled students/school age population)



Elite

Mass

Universal

(Trow)



ISSUES AND CHALLENGES

College admission dominates k-12 education

- **Dominance of prestigious institutions**
- **Severe competition to get into prestigious colleges**
: “exam hell”
 - Teachers: Pressure to focus on test-taking skills rather than life skills
 - Students: Learning burden, lack of motivation to learn
 - Parents : Private costs of education (2% of GDP on private tutoring)
- **Policies to subdue excess competition**
 - Ban on private tutoring
 - High School Leveling Policy for last 30 years
 - Debate between egalitarianism and elitism

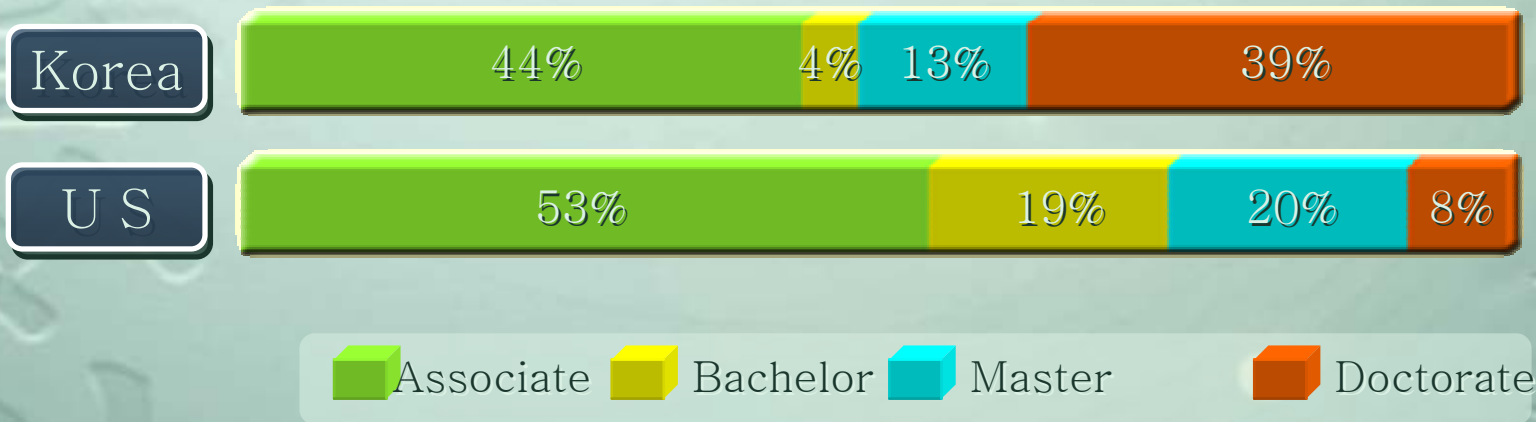
Extent of specialization is too low

■ No differences among universities → monotonous system

- the Number of programs per university : 38 ('90) → 57 ('04)

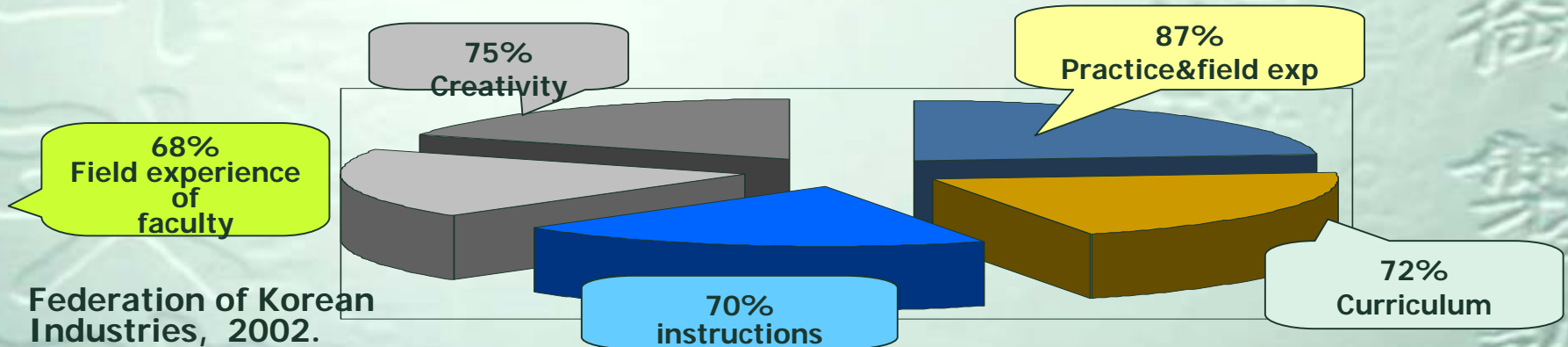
■ Excess supply in graduate students

- Unemployment rate (engineering) : 9.8%('97) → 16.6%('03)
- 139 of 200 4-year universities offer doctoral degree



HE is not pertinent enough

■ Extent of dissatisfaction: CEO's view on HE



■ Mismatch between jobs and majors

	(%)			
	Badly Mismatched	Mismatched	Matched	Well Matched
Jr.College	33.3	15.8	26.7	24.1
University	25.4	15.0	27.9	31.6

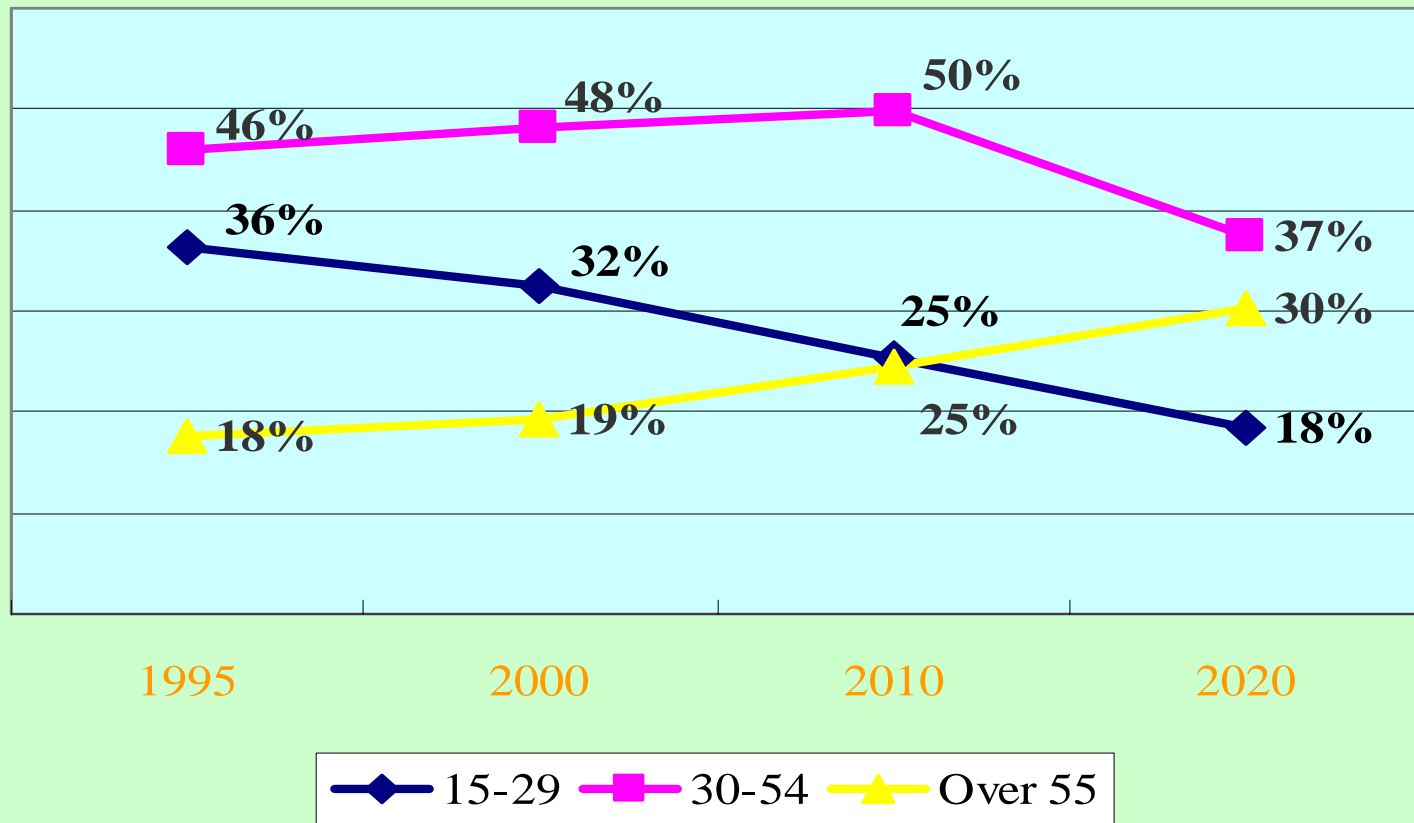
Source: Office of Statistics, 2003

Stakeholders are disconnected

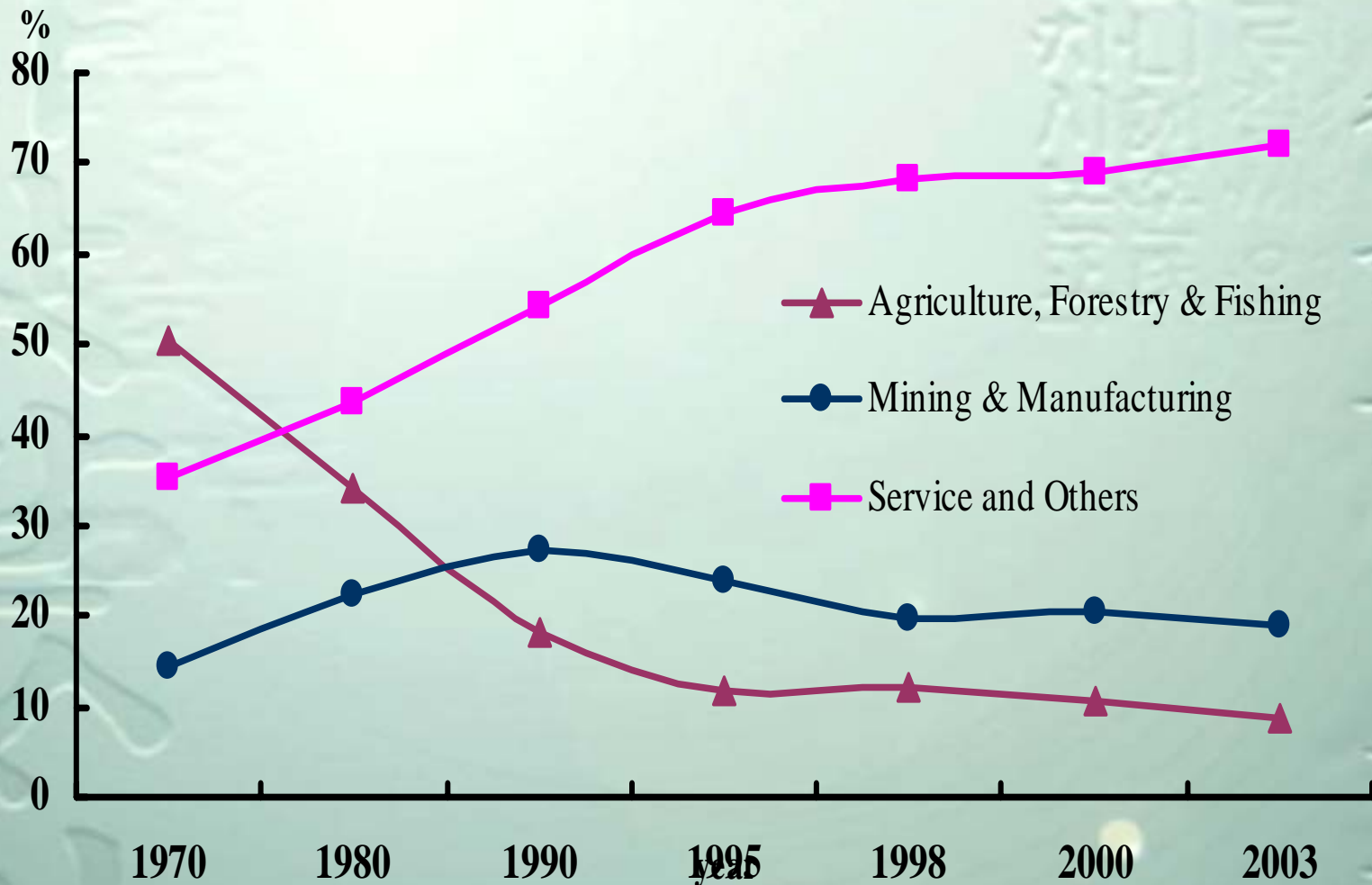
- **Limited university-industry partnership**
 - **Low mobility between academia and business**
 - **University portion of industry's R&D investment: 2.4%('00) → 1.7% ('03) (MOST, '04)**
- **Low commercialization of university-based IPRs**
 - **Patent share (90~'01) : universities 0.5%, companies 78.8%, research institutes 2.9%, individuals 17.8%**
- **Un-coordinated financial support to universities**
 - **Duplication of funding for the same purpose by several line ministries**

HE is not prepared for an aging population

<Source : National Statistical Office>



Nor is it matched up to a structural change in the economy



The background features a stylized globe with a grid pattern, partially obscured by a dark blue wave-like graphic that curves across the top and bottom of the frame. The overall color palette is shades of blue.

REFORM INITIATIVES

Globally Competitive Higher Education



**Top-notch
professionals**

(Graduate Schools)

**Regional
innovation
initiators**

(Universities)

**Industrial
engineers**

(Junior Colleges)



Restructuring &
competition

Selected funding
for specialization

LB information

Partnerships

Major strategies

- **Minimum regulations to maintain social solidarity**
- **Promotion of restructuring and competition through market discipline**
 - use of various incentives and disincentives
- **Funding based on “selection and concentration”**
 - targeted funding for specialization and regional parity
- **Financing learners rather than providers**
 - learner-oriented/demand-side financing (student loans)
- **Improvement of HE/labor market information**
- **Enhancement of networking and partnerships with local governments and business community**

Improvement of professional training

■ Internalization of professional programs

- Encourage collaboration with world-class institutions
- Provide financial incentives (e.g., BK21)

■ Institutionalization of professional schools in high value-added service sector

- Law, medicine, MBA, international finance, etc.
- Promote training at graduate level rather than at undergraduate level

Strengthening of research training

■ Brain Korea 21 (BK21) Project

- Goals: 1) to develop a world class R&D Manpower; 2) to reform university education and R&D
- Funding based on “performance contracts”: Invest \$1.2billions for 7 years(1999-2005)
- Major outputs:
 - SCI : 4,414 (1999) → 7,477(2003)
 - Patent : 103(1999) → 261(2003)

■ Preparation of a 2nd stage BK21 (2006-2013)

- Building on the successful features of BK21 and scaling up
- “Selection and Concentration” on a few key areas
- Strengthen industry-university partnerships

Universities for regional innovation

■ New University for Regional Innovation(NURI) Project

- Goal: Capacity building of regional universities to promote innovation and HRD at regional level
- Target: Universities located outside the Seoul metropolitan area
- Performance based funding: Invest US \$ 1.4 billions for 5 years (US \$ 0.24 billions in 2005)

Vicious Cycle

- Lack of investment & innovation
- Low productivity
- Low RGDP, limited job opportunities



Virtuous Cycle

- Investment & high competitiveness
- RGDP growth & Job creation
- Balanced national development

Creation of external pressure

■ Introduction of a new HE quality assurance system

- External review of institutional performance
- Overhaul the quality assurance system including the accreditation and certification process
- Financial provisions aligned with institutional evaluations
- Create a buffer body between government and university

■ Disclosure of information

- Data on key inputs: PT ratio, unit expenditure, occupancy/enrollment rate, etc.
- Outcome measures: persistence/graduation rate, employment rate, reputation of graduates, customer satisfaction, IPRs, etc.

■ Financial incentives for reform and restructuring

- Subsidies linked to M&A among institutions

Improving HE policy coordination

■ Increasing the role of National HRD Committee

- Public expenditure review of HE investment projects
- Coordination and prioritization of various HE projects
- Increasing policy linkage for synergy effects (e.g., R&D and HRD)

■ Realignment of role division between line Ministries

- MOE&HRD focuses on HRD and basic research training
- Ministry of Science & Technology specializes in university based R&D and applied research
- Other Ministries finances sector-specific investment projects (e.g., IT, BT)

Facilitation of university-industry partnerships

■ “Connect Korea” Project

- Establishing Consortium between TLOs (Technology Licensing Offices) in Universities
- Connection between Demand (Industry) and Supply (University)
- R&D and Tech. Development → Transfer Results/Products → Commercialization → Reinvest in Technology Development
- Dissemination of best practices



Linking Labor Market (LM) information to HE

■ Improvement of LM information

- Periodic skill/manpower projections: by industry, occupation and educational attainment
- Investment in data collection, analysis and forecasting

■ Provision of LM data to stakeholders

- HE institutions use information for adjustment of programs and curricula
- Student/parents make “informed decision” on career paths

Each Country Faces Incredible Challenges

■ Ireland

- Global Competition: EU 25+, India, China
- Relations With North
- Energy
- Cost Structure
- Changing Culture

■ Korea

- Relations With North
- Global/Regional Competition: China, Japan, India
- Energy
- Language
- Impending Labor Shortage (2020)

Significant Differences in History, Demography and Culture

■ Korean Higher Education

- 80% of Enrollment and Most of Growth in Private Institutions
- High Dependence on Tuition Fees
- Comparatively Low Participation of Women
- High Emphasis on Prestige
- Korean Higher Education Perceived as Under Performing Compared to Other Sectors

Significant Differences

■ Irish Higher Education

- Most of Enrollment in Public Institutions
- Mostly Public Funding: Limited Tuition Fee Revenue (Except Foreign/Non-EU)
- Undergraduate With Developing Graduate Education and Research

Lessons from Ireland and Korea

- National Strategy
 - Consensus on Urgency
 - Benchmarking to International Indicators
 - Sustained, But Redefined as Conditions Have Changed
- Higher Education Integral to Nation's Strategic Economic and Social Development

Lessons

- Reform Focused on Whole System:
 - Linked to Early Childhood Education through Graduate Education and Research
 - All Levels of Higher Education: Technical, Regional, Research Universities, Lifelong Learning

Lessons

- Major Priorities for:
 - Developing Global Competitiveness in Research and Technology
 - Linking Higher Education to Regional Development

Lessons

- Emphasis on Decentralization/Deregulation
Balanced by National Strategic Leadership
and Coordination Across All Government
Entities:
 - Education
 - Science and Technology
 - Economic Development
 - Employment

Lessons

- Using Finance Policy to Leverage Change
 - Ireland:
 - Strategic Funding
 - Science Foundation Ireland
 - Agreements with Institutions

Lessons

■ Financing

➤ Korea

- BK 21
- Industry/Academic Collaboration
- Links with Regional Development
- Incentives for Mergers/Consolidation

Conclusion

- U.S. Remains a Leader, Especially in Higher Education
- Other Countries Are Quickly Catching Up to or Exceeding U.S. in Education Performance
- Lessons from Ireland and Korea: A Sustained, Long-Term Strategy Pays Off in Long-Term Education, Social and Economic Progress