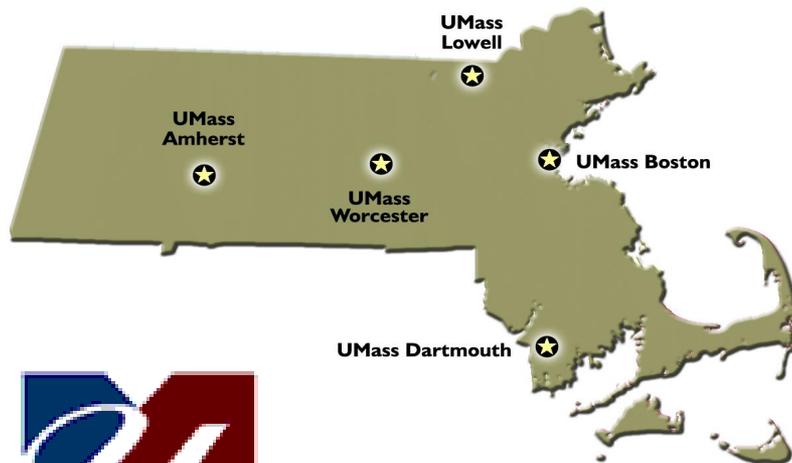




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Globalism, Outsourcing, and the American University



By:
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President
University of Massachusetts
August 9, 2004

What shapes my views

- 34 years as a professor and administrator of all sorts
- Founder of company built through VC into NASDAQ
- Formerly J. Erik Jonsson Distinguished Professor of Physics Engineering Science, Information Technology, and Management at RPI
- Co-Founder Severino Center for Technological Entrepreneurship
- Leader of MassInsight/Battelle S&T Roadmap for Mass.
- Strong involvement in international programs including Asia, Eastern Europe, Mexico, etc.
 - China from 1982- this September. Chair, U.S.-Japan-China Trilateral

Outsourcing

- The flow of jobs to countries with lower wages and higher productivity.
- A huge political hot potato
- Lowers costs
- Raises productivity
- Stimulates economic development around world
- Creates unemployment in the sending sector

How big is the problem?

- U.S. labor Department: 4633 jobs moved overseas in first quarter of 2004.
 - This is 2% of layoffs
 - Caveats: only large (>50) companies who laid off at least 50 persons!
- Indian Nat. Assn. of Software and Services:
 - 200,000 jobs created in India in year ended Mar 31, 2004
 - 50,000 per quarter
- Someone is missing something somewhere!

How big is the problem - 2

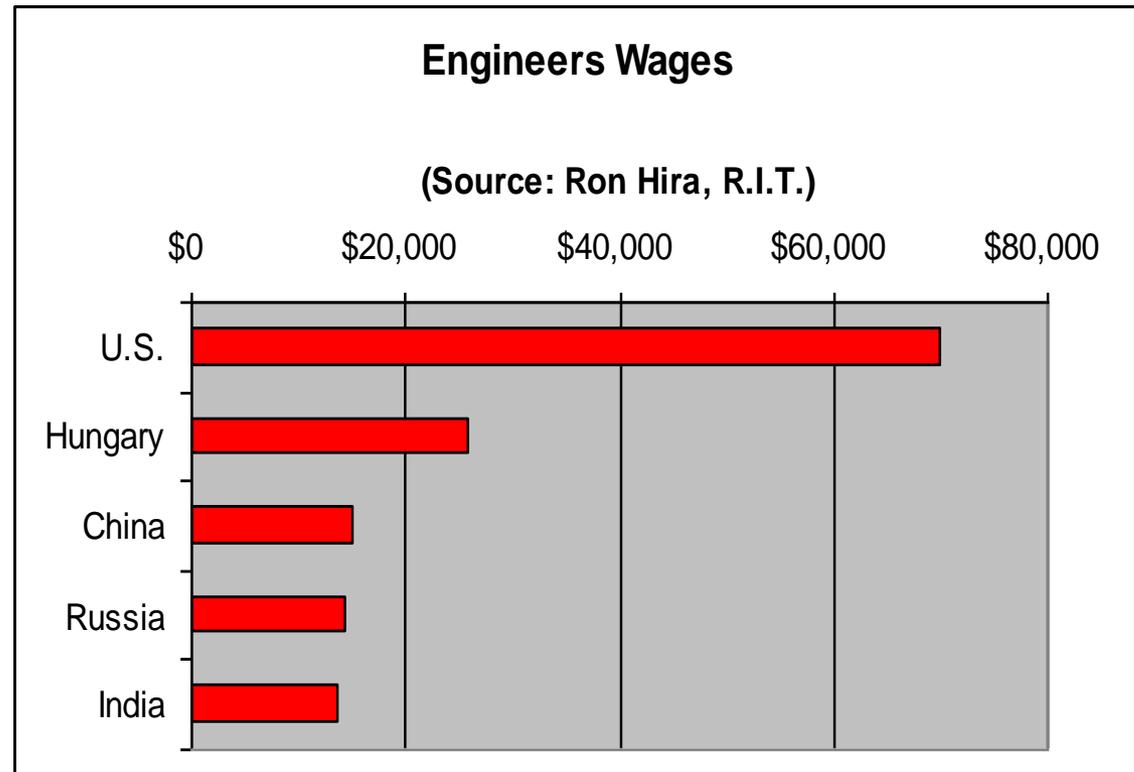
- Forrester Research: 3.3 million jobs by 2015
 - \$ 136 billion in wages lost
- Gartner Inc.: estimates 10% of Computer services and software jobs to be outsourced by 2004 end.
- Deloitte Research surveyed 100 of the worlds largest financial services companies
 - Expect to outsource 2 million jobs in next five years.
 - Outsource \$356 billion in operations in next five years

How big is the problem -3

- According to Business Week
 - Intel: 3,000 chip design jobs to India by 2006.
 - Microsoft 500 software design jobs to India and China in 2003.
 - Oracle: 4000 software design jobs to India in next five years.
 - Phillips: 700 consumer electronic design jobs to China in next few years.

Cost of Engineers

- U.S. \$70,000
- Hungary \$25,690
- China \$15,120
- Russia \$14,420
- India \$13,580



- In spite of the wage differential, overseas wages make engineers well paid by local standards.

Historical Trends?

- Steel making
- Automobiles
- Textiles
- Call Centers
- Engineering
- Software



Issues with outsourcing

- Cost
- Language
- Culture

Cost

- As a country develops, cost advantages tend to lessen rapidly, but do not disappear immediately
- Japan quickly lost a cost advantage in automotive manufacturing just as Germany had done decades earlier.
 - Some production moved to U.S.
- India is starting to experience some inflation in the call center cost structure.
 - Indian Companies are now trying to acquire some U.S. companies.

Strategies for success?

- Protectionism
 - History is not kind to this strategy, however politically necessary it might become
 - Best used in transition and is not an end game.
- Innovation
 - Historically our best strategy, but it requires investments that we are not making!
- Higher Education seems to be the key everywhere.
- Collaboration between government, higher ed, industry, and schools.

Why?

- Gail Dundas, Intel Corporation
 - “You have to look at all the factors. There are times when cost effectiveness is a part of it, but it is not the stand alone reason. We have growing markets, good talented people in those markets, and people who are more educated than ever before.”

American Universities are the Greatest in the World!

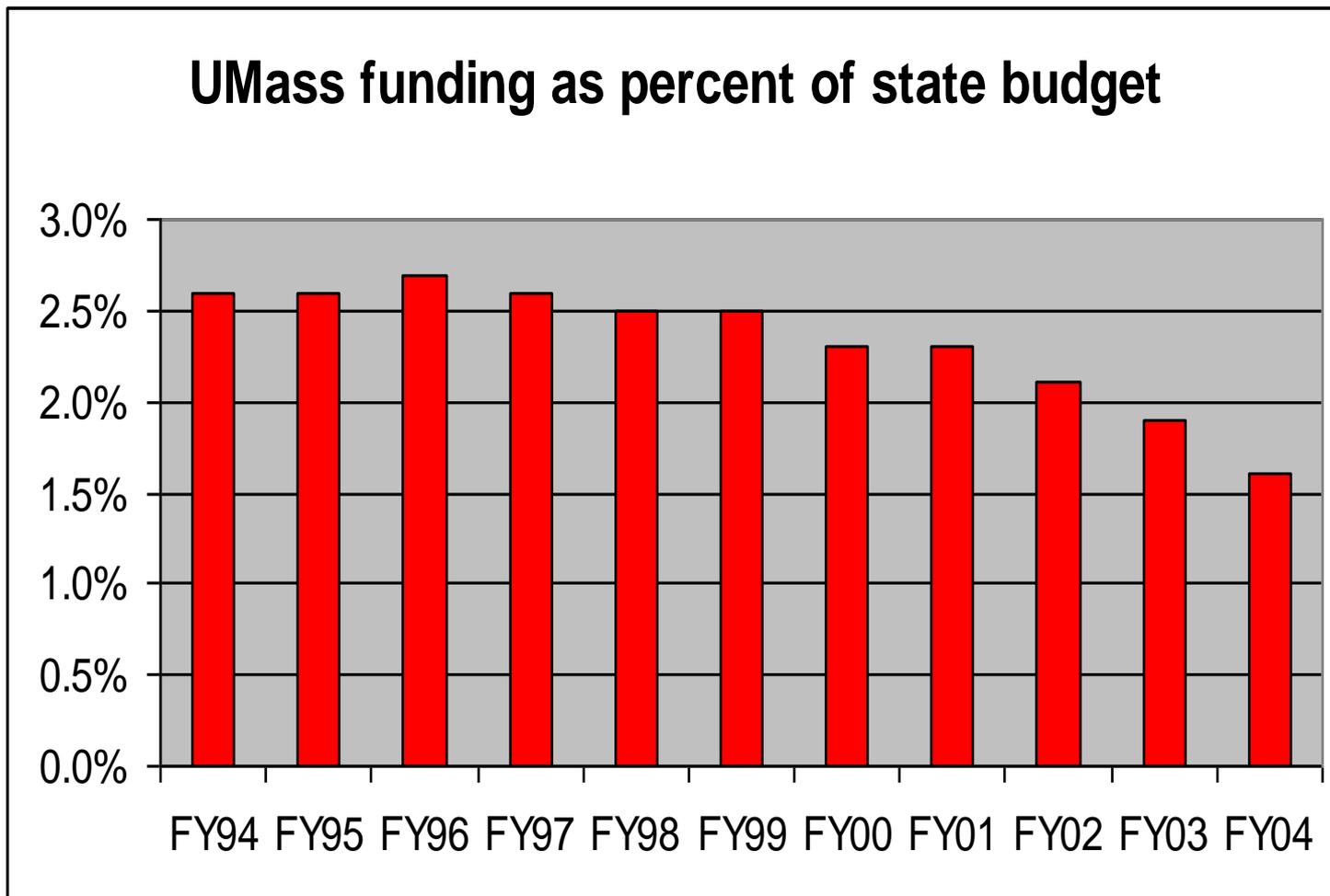
- Well, yes, but....
- Have you ever visited:
 - Tsingua University
 - Beijing University
 - Shanghai Jiao Tong University.
 - The Indian Institutes of Technology
 - The Max Planck Institutes
 - Etc.
- U.S. ranks 6th among O.E.C.D. countries in BA/BS by 20's.

American Public Higher Ed. Under Stress

- “To economists, higher education is like motherhood or apple pie. It will cure anything, from globalization and outsourcing to technological change and income inequality.”
 - Jeff Madrick, “Why Higher Learning Gets the Ax”, New York Times; (August 5, 2004).
- Compare Boston and Detroit: “Aside from climate, skill composition may be the most powerful predictor of growth.”
 - E.L.Glaeser, Harvard and A. Saiz, Univ. of Pennsylvania

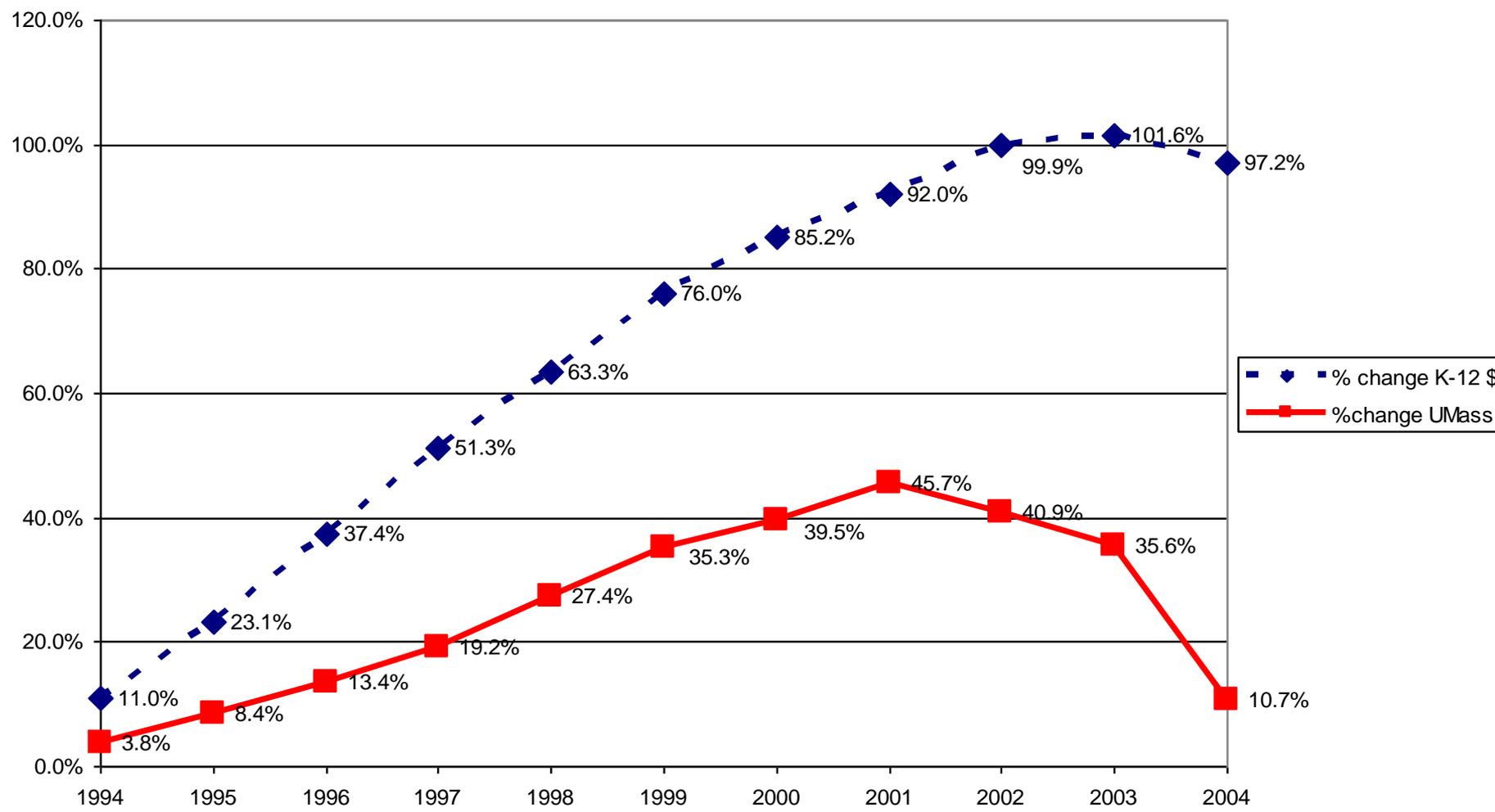


Reverse the dramatic disinvestment in higher education





Cumulative growth in state spending UMass vs. K-12



Messages to our universities

- While the ability to solve complicated models and equations will remain important, it will by no means be enough.
- Educating Engineers, and all students, more broadly to understand:
 - Communication,
 - Culture,
 - Economics,
 - People skills and team dynamics,
 - Entrepreneurship
 - Ethics,
- Tapping women and underrepresented minorities
- Take quality and standards to the next level!

Universities must connect to communities.

- Work force development
 - Community needs in bio-, nano-, info-, medical-technologies.
- Educating underrepresented groups
- Collaborating with industry
- Research and Venture Capital are the fuel-air mixture for innovation.
- Technological entrepreneurship



UMass Focus and Mission

- UMass is a state-wide, high-quality learning and discovery institution that transforms the lives of students and communities in Massachusetts.
- The path to the **economic** and **social** development of Massachusetts and its diverse regions goes through UMass.

A Recent Case in Point

- CASA: And Engineering Research Center
 - Collaborative Adaptive Sensing of the Atmosphere
 - University partners: UMass Amherst, University of Oklahoma, Colorado State University, and the University of Puerto Rico, Mayaguez
 - Industrial partners: Raytheon, IBM, MA/COM, Vaisala, Vieux and Associates, Telephonics, and The Weather Channel
 - Government partners: NSF, NOAA's National Severe Storms Laboratory and Oak Ridge National Labs



CASA: Not an accident

- Began with ~ \$1 million donation from John Armstrong, former VP of IBM which was matched to create the Armstrong Chair at UMA.
- David McLaughlin fills chair.
- Research Constellation develops with Computer Science Professor Jim Kurose and others.
- Research funding grows
- Local investment to prepare ERC
- Governor gives \$ 5 million match in difficult time
- Potential \$ 40 M ++ Center is funded.

CASA: What does it mean?

- Ensure leadership in research in area.
- Collaboration positions key Massachusetts employers for continued success.
 - Raytheon: microarrays of collective radars
 - IBM: Real time data analysis from multiple sources.
- Yields possibility for new company spin-offs.
- Provides economic stimulus in western Mass.

Another Case in Point

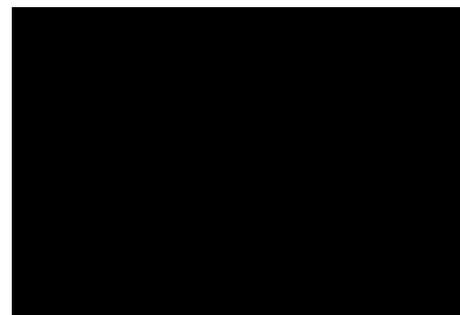
- RNAi Discovery (2 of 3 researchers at UMassMed)
- Promises opportunities for both research and treatment of genetic or DNA and RNA based diseases.
- Science magazine designates this as the number one discovery of 2002.
- Initial license for \$10 million to existing company.
- New company created in Worcester.
- Worcester positioned to be the center of development of RNAi technologies

And there is more

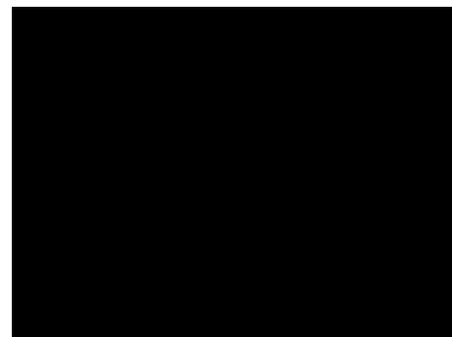
- Konarka Technologies – Lowell
- Avant Immunotherapeutics – Fall River
- Green Chemistry – Boston – Lowell
- Fisheries and Marine Sciences – Dartmouth
- UMass Amherst – BayState Partnership



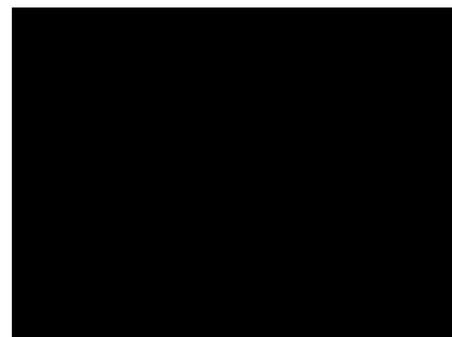
Saving Our Children



UMass On Our Side

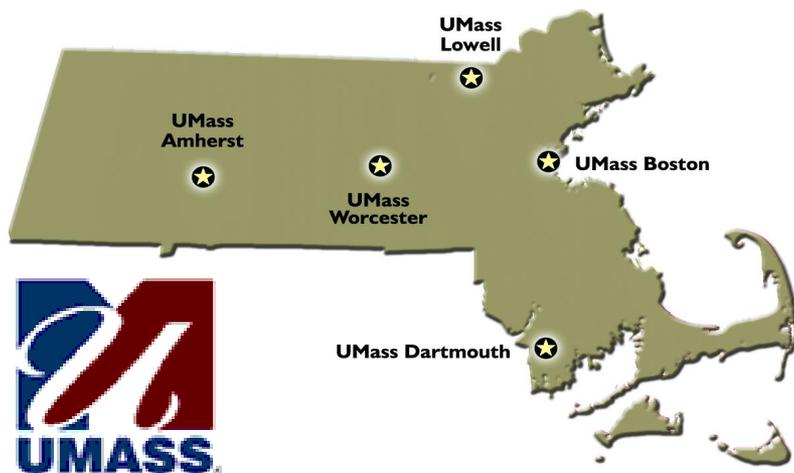


Imagine





Globalism, Outsourcing, and the American University



**THANK
YOU!**