

Changing Career Paths of Young Scholars in the United States: Example of the Life Sciences

Paula Stephan
Andrew Young School and
Georgia State University
Katholieke Universiteit Leuven

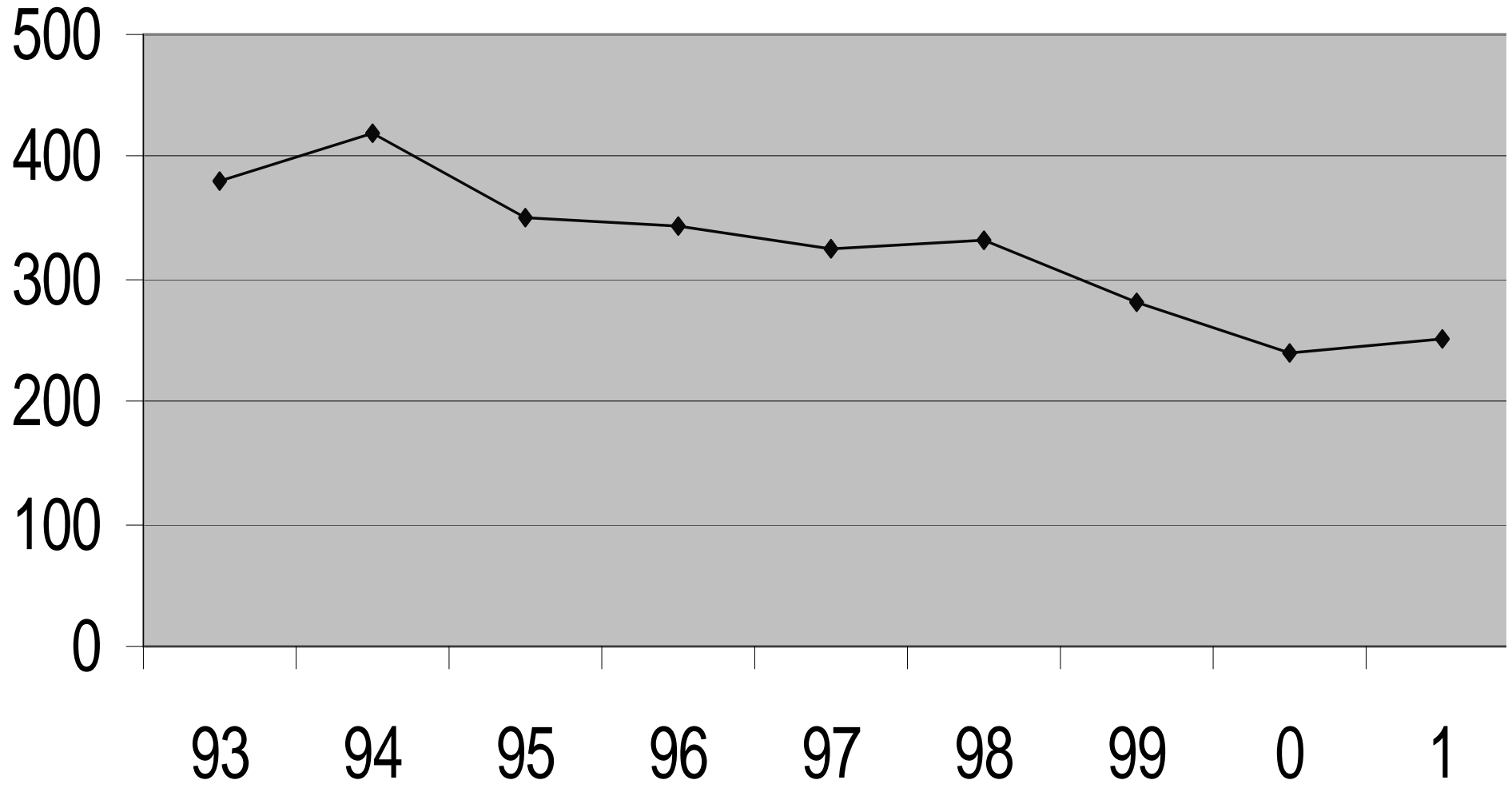
Acknowledgements

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Setting the Stage: NIH Awards

- Probability of those under 35 being awarded funding from NIH is declining
- The canary in the mine: a warning that there are serious career challenges for young scientists in the U.S.

Awards 35 and Under



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Age at First Major Independent Research Support (R01/R29)

- 1980 for PhDs: 37 was average age
- 1990 for PhDs: 39.5 was average age
- 2002 for PhDs: 41.9 was average age
- *Note: Success rates for new competing R01 and R29s are highest for those 35 and younger of any age group; second highest success rate is for those 36 to 40.*

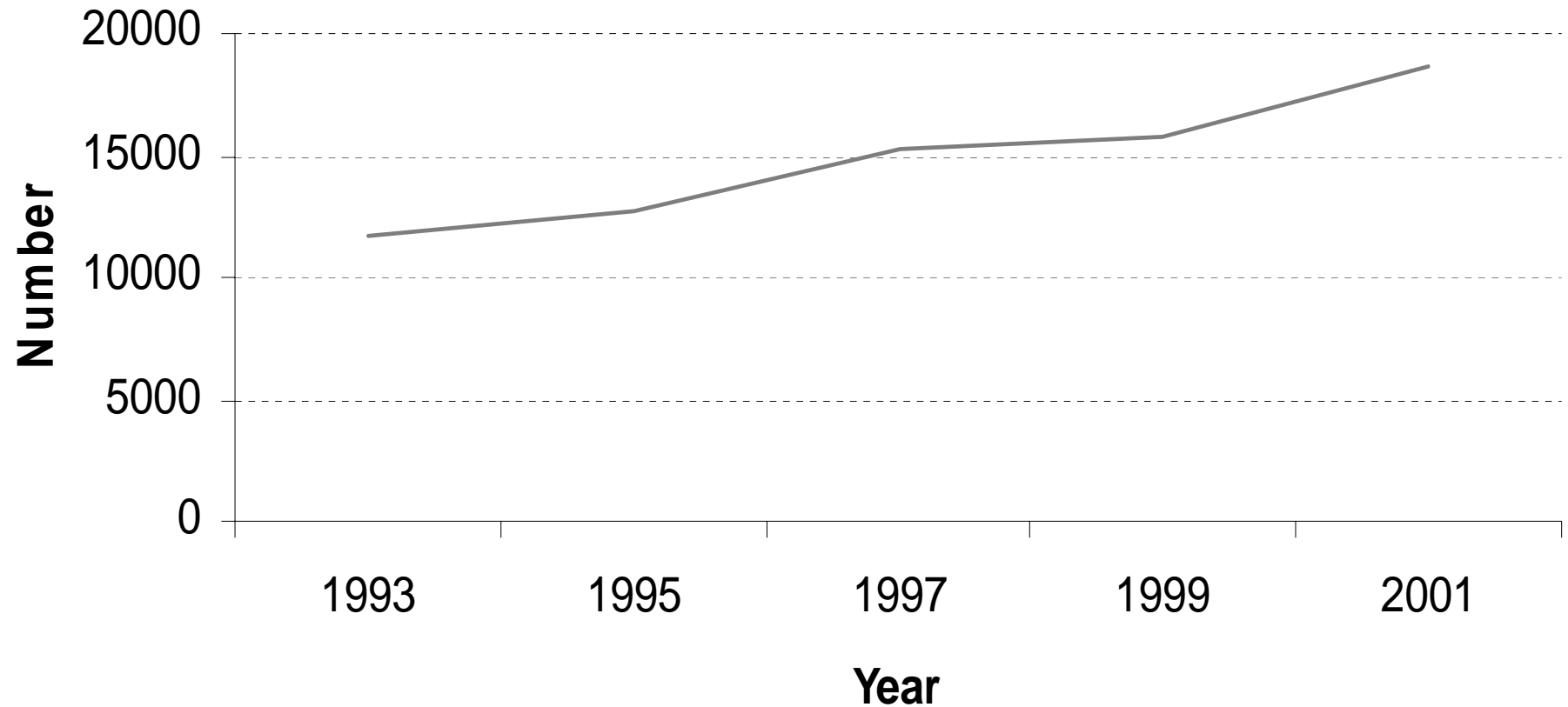
What's Happening to Jobs in Academe?

- Necessary condition to receive a NIH competitive award is to have a position from which one can apply for funding.
- This means:
 - Tenure track position or, in some instances, non-tenure track position with faculty rank
 - Especially at a Research I Institution

Questions

- Question 1: What is happening to the number of PhDs 35 or younger trained in the biomedical life sciences in the U.S.?
- Question 2: What is happening to the number of PhDs 35 or younger in tenure track positions or in non-tenure track positions with faculty rank in the U.S.?
- Question 3: What is happening to the number of PhDs 35 or younger in tenure track positions at Research I institutions in the U.S.?

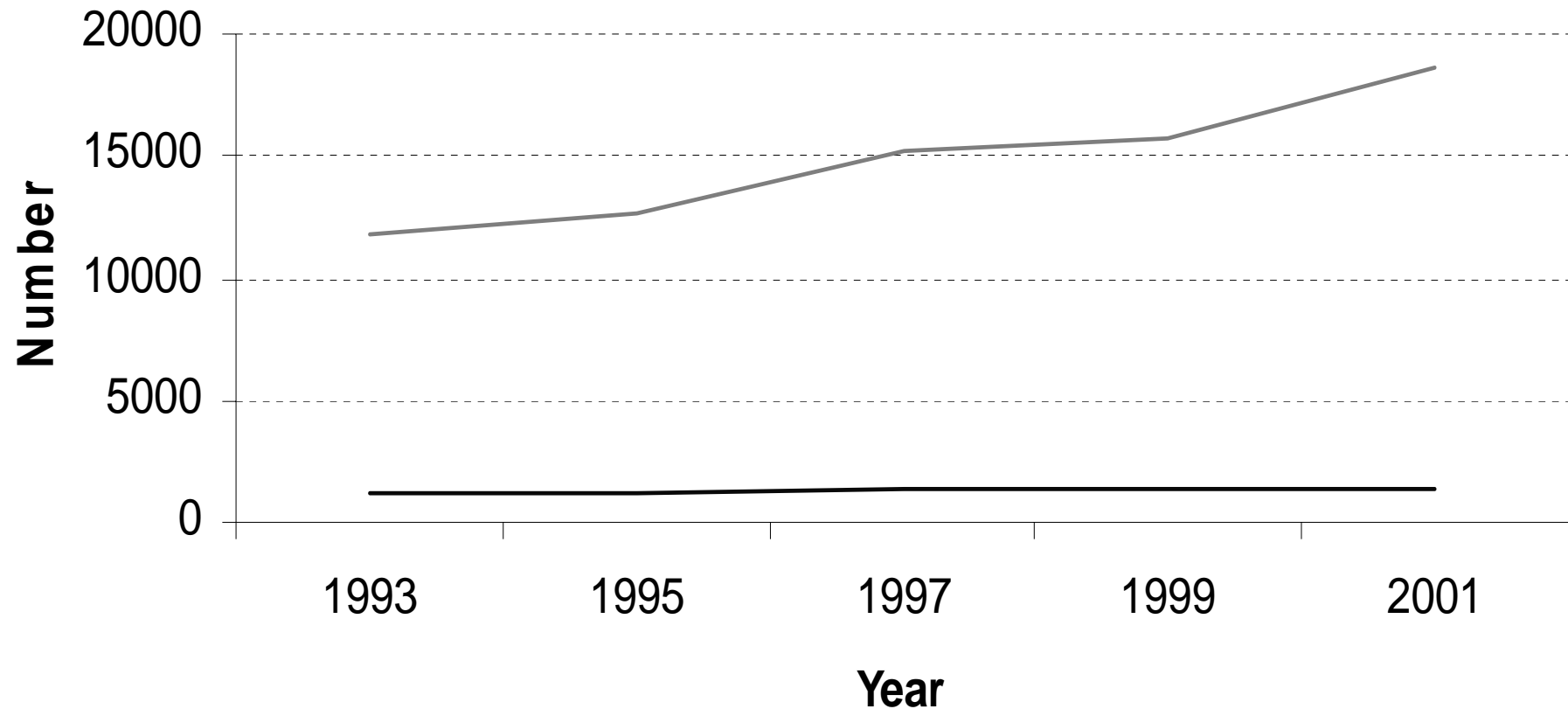
Biomedical Ph.D.s Age 35 or Younger



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— Age 35 or Younger

Biomedical Ph.D.s Age 35 or Younger



— Age 35 or Younger — In Tenure-track Jobs

Conclude

- Number of life scientists 35 or under has grown considerably in last 8 years: 11,715 to 18,671 (59%)
- Number of life scientists 35 or under in tenure track positions has remained almost constant: 1212 to 1294 (7%)
- *Conclude: probability that a young person trained in biomedical life sciences holds a tenure track position in United States has declined considerably in recent years: 10.3 % to 6.9%*

Faculty Rank, Non-tenure Track, 35 or Under

- Number 35 or under in assistant, associate and full positions who are not on tenure track or for whom tenure track is not applicable was 389 in 1993; grew to 527 by 2001.
- Including this group with tenure track group, we conclude that probability of being in a faculty rank position has gone from 13.7% to 9.7% during the 1993-2001 period for those 35 and younger.

Research I Institutions

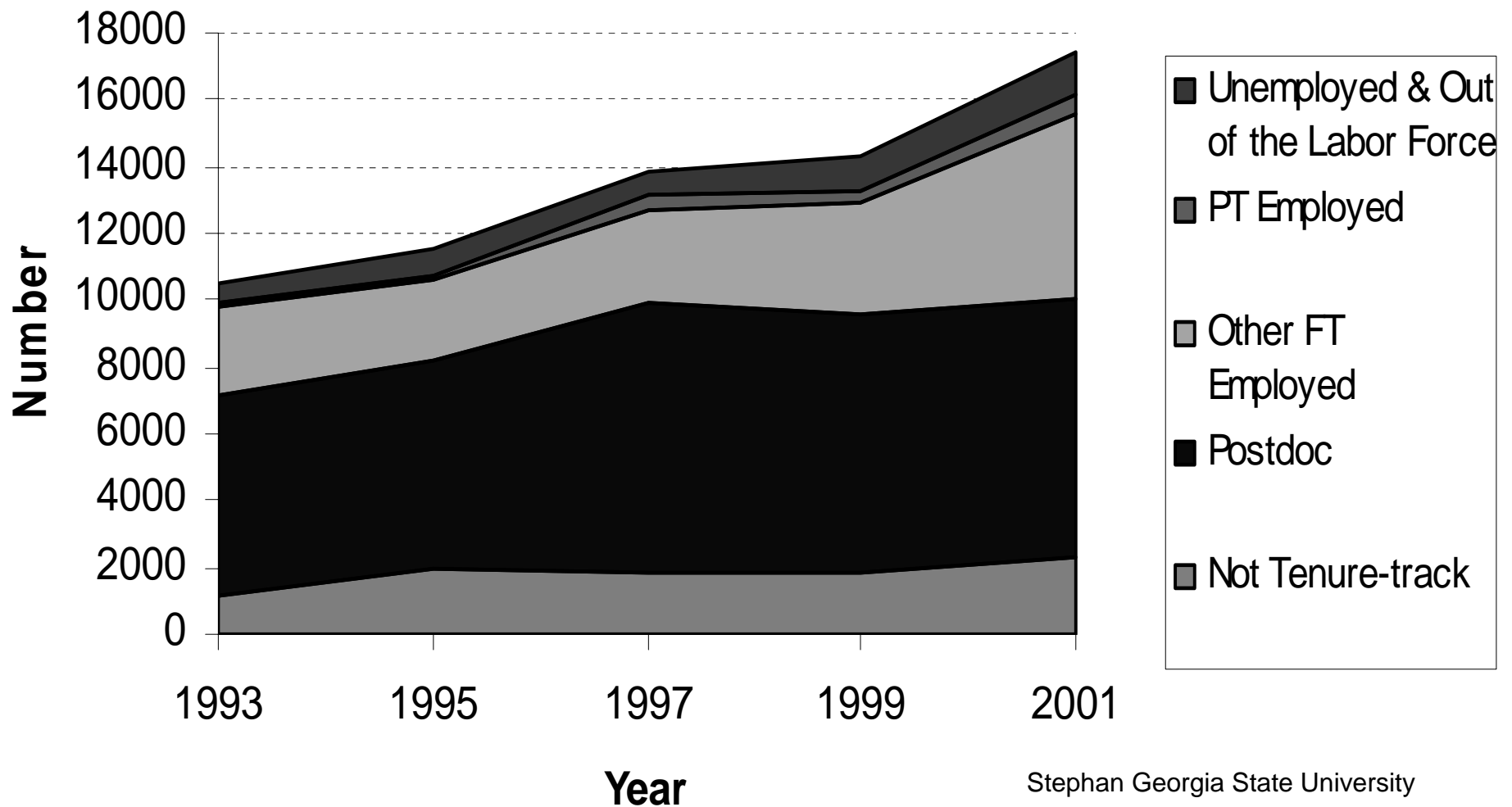
- 11,719 tenure track positions in 1993
 - 618 were 35 or younger (5.3%)

- 12,434 tenure track positions in 2001
 - 543 were 35 or younger (4.4%)

Where are the under 35 if not in Tenure Track Positions?

- Post doc
- Working in industry or for government
- Employed part time
- Not working

Labor Force Status of Biomedical Ph.D.s Age 35 or Younger in Other than Tenure- Track Positions



Conclude

- Growth in “other” sector—primarily industry
- Numbers in post doc positions began to stabilize or decline beginning in 1997
- Numbers in non-tenure track grew

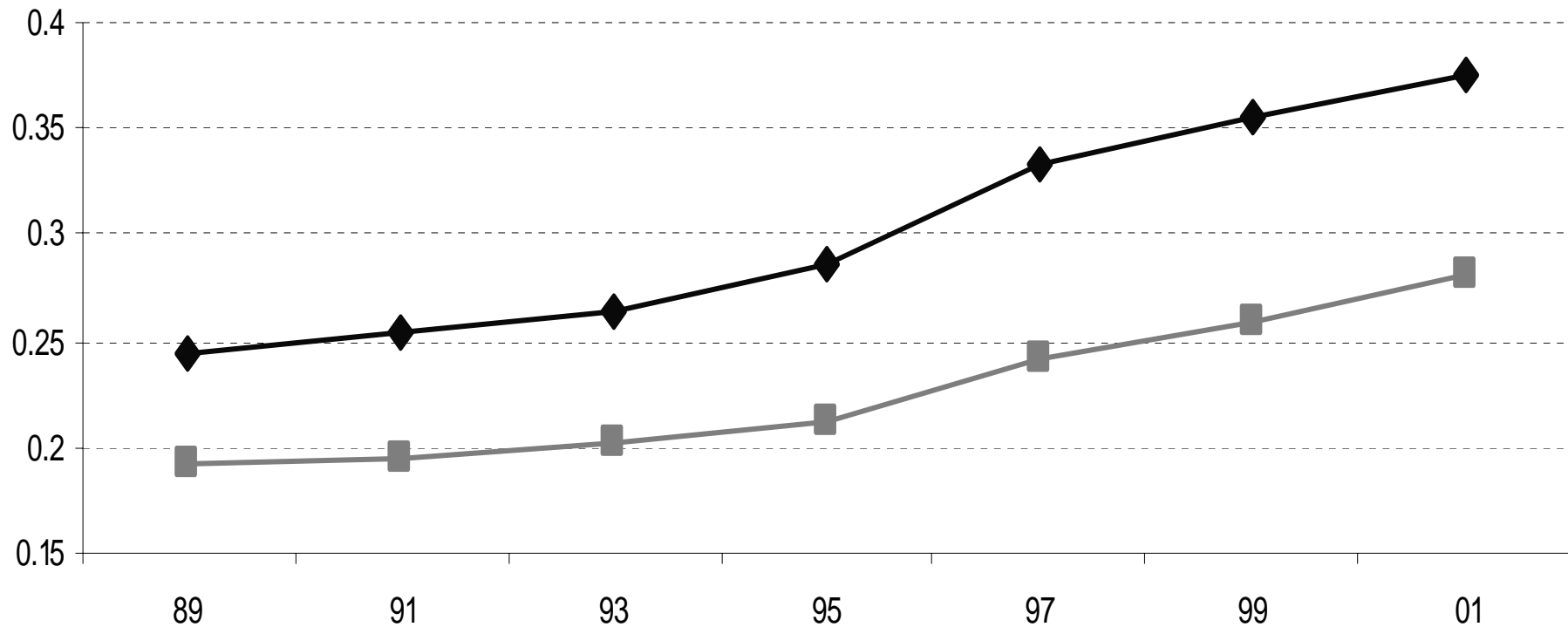
Trends Not Necessarily Permanent

- Industry has been slow to hire in aftermath of 2001 recession
- Decline in post doc positions is sensitive to economic conditions
 - Poor economic performance of academe discourages individuals from taking a post doc
 - Good prospects in industry discourage individuals from taking a post doc
 - Explains what we see in the late 1990s;
 - But, as job prospects in industry have declined, post doc taking rate has increased again

The Mix of Faculty Positions Is Changing

- Percent of biomedical faculty in non-tenure track positions has grown from 26% to 33% in 8 year period.
- While some of this growth is in “ranked” positions, considerable amount is in non-ranked, staff scientist positions.
- Matches a national trend across disciplines and universities in the United States

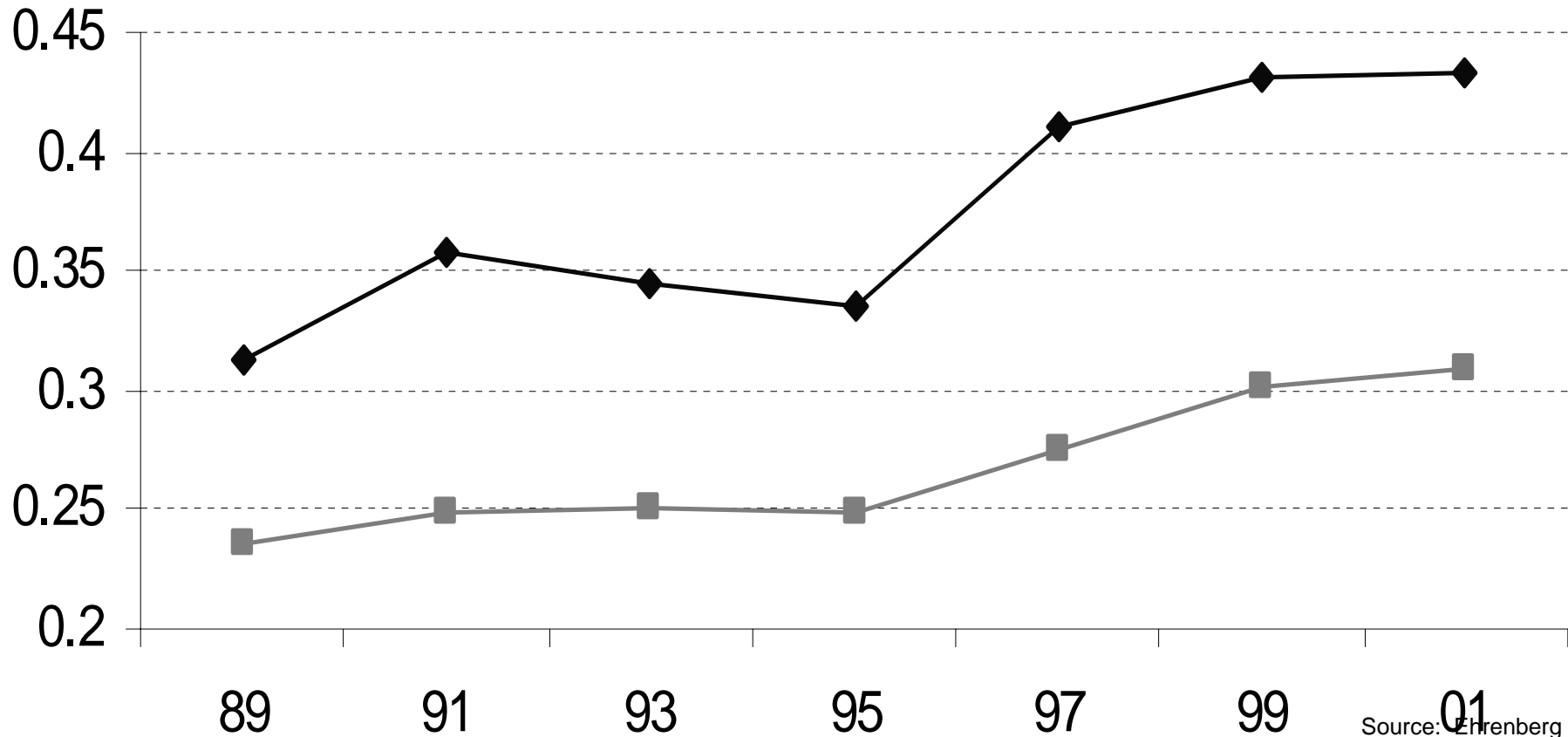
Full Time Non-tenure Track Faculty as a Percent of Full Time Faculty: Public



—◆— Public Research 1 —■— Public All

Source: Ehrenberg and Zhang.
IPEDS Fall Staff Survey.
Stephan Georgia State University

Full Time Non-tenure Track Faculty as a Percent of Full Time Faculty: Private



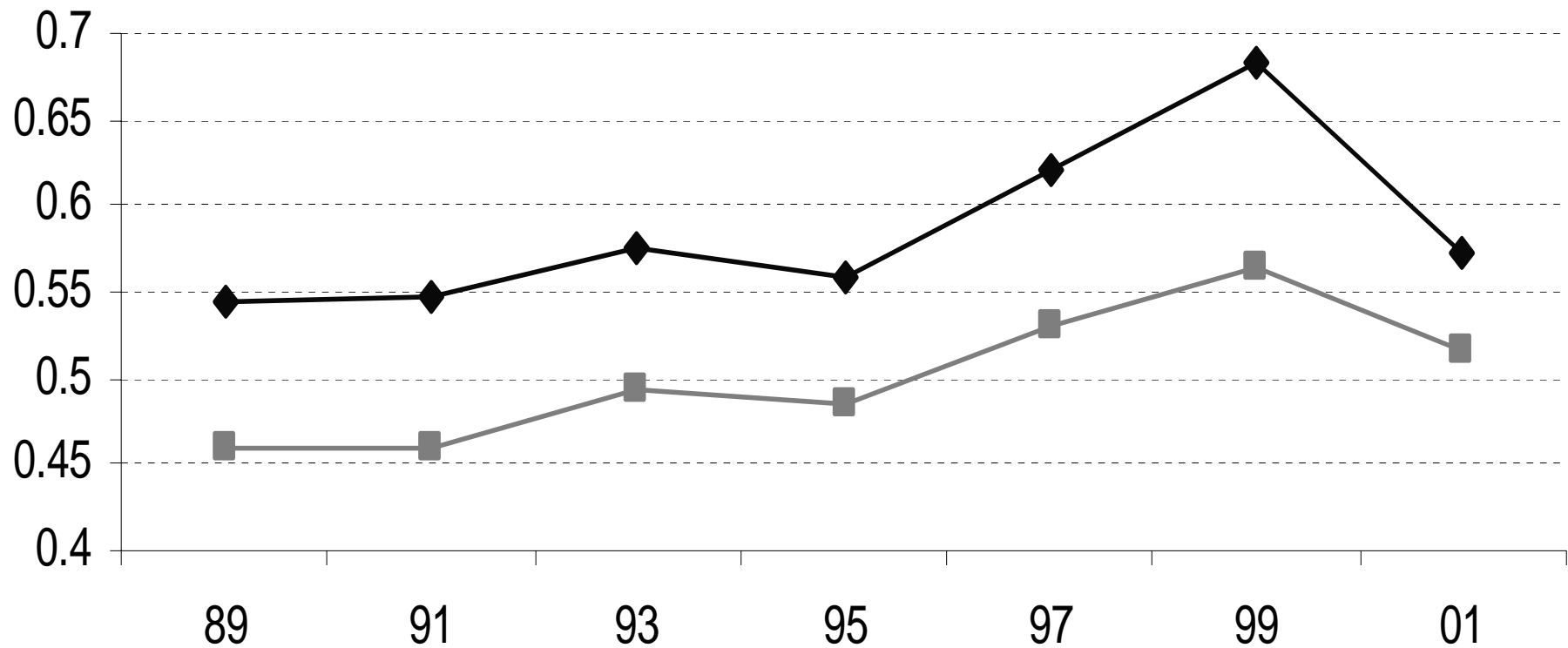
◆ Private Research 1 ■ All Private

Source: Ehrenberg and Zhang. IPEDS Fall Staff Survey.
Stephan: Georgia State

University Profile

- Non-tenure track positions are on the increase
- Moreover, when universities hire they are more likely to hire non-tenure track faculty than tenure-track faculty

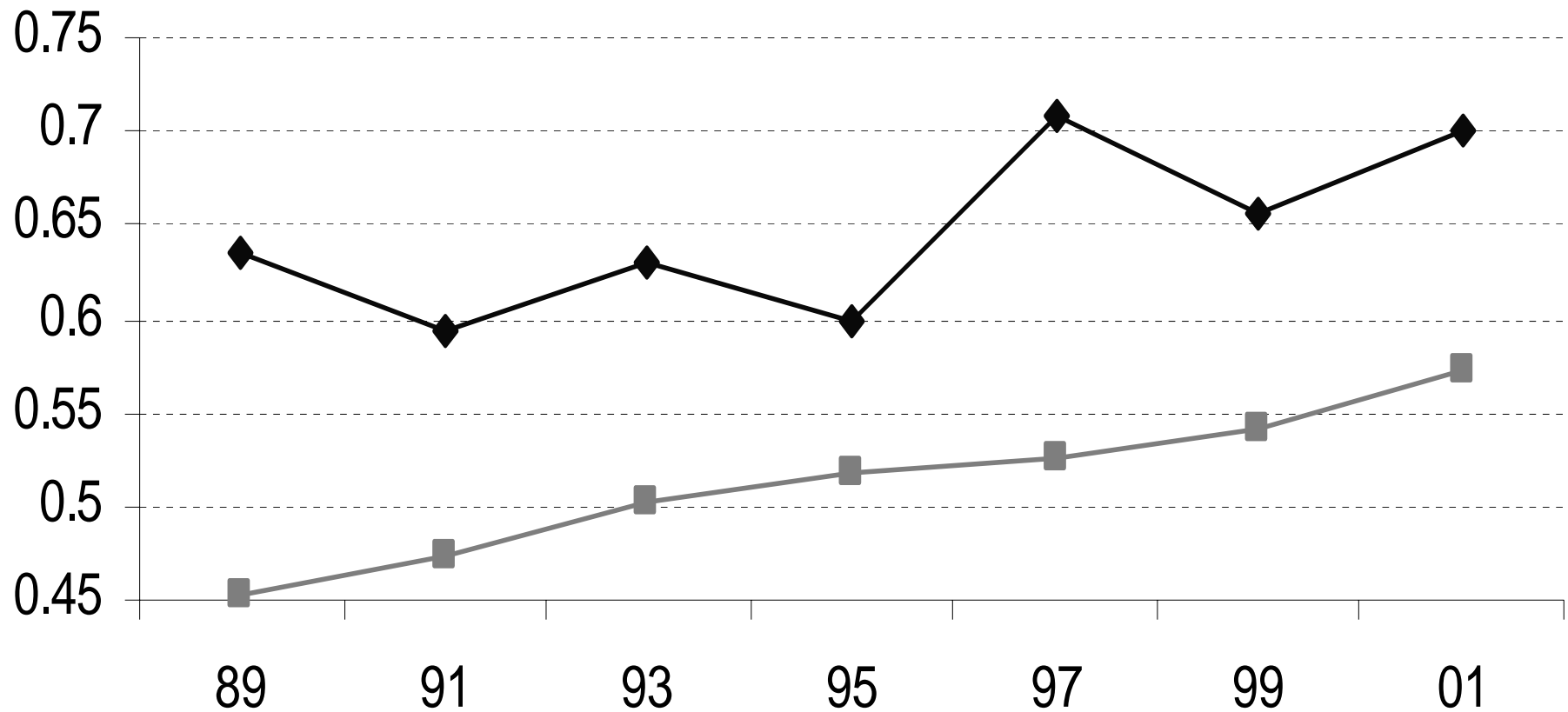
Non-tenured New Hires as a Percent of Total Hires: Public



Public R1 All Public

Source: Ehrenberg & Zhang
Stephan: Georgia State

Non-tenured New Hires as a Percent of Total New Hires: Private



—◆— Private Research 1 —■— All Private

Source: Ehrenberg & Zhang
Stephan: Georgia State

What Explains Hiring Trends?

- Budget crunch in state funds and endowment payouts affects hiring
- Salaries of tenure track higher than salaries of non-tenure track: empirical work shows that this leads to a substitution away from tenure-track (*Ehrenberg & Zhang*)
- Funding for non-permanent positions available in grants

What Explains Hiring Trends continued

- High start up costs of tenure track hires
 - Assistant Professor in Biology start up package (*Ehrenberg, Rizzo and Jakubson*)
 - Private Research I--\$403,071
 - Public Research I--\$308,210
 - At these (and higher) rates, universities are tempted to recruit senior researchers away from another university; safer financial bet. Costs more but get an “immediate transfer” of grant money.
- White hair explanation is fairly minimal
 - Number of tenure track over 65 has increased by 472 in biomedical life sciences during the period. Most of growth over 55 (2300 more in 2001) is from “younger” white hairs.

Conclusions

- Overall number of young biomedical scientists growing
- Tenure track pool is small and not growing—declining at Research I institutions
- Job growth in industry in 1990s but tempered by recent economic conditions

Attracting Students to Careers in S&E

- Common concern among OECD countries is attracting students to careers in S&E
- The challenge, I would argue, is making career outcomes more appealing
- The current situation in the life sciences is not an effective model for accomplishing this.

Caveat

Conclusions just as good as the data.
SDR great source of data on US-trained
PhDs but does not count those who
received PhD training outside US or MDs
who do not have a PhD as well.