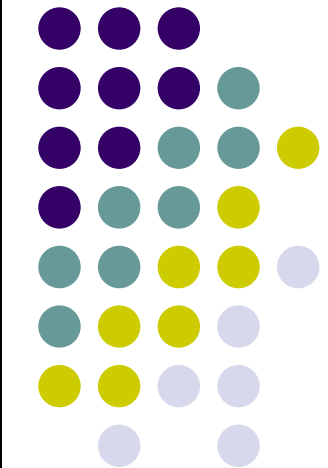


The Economics of Science Publishing

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on Science & Technology Policy**



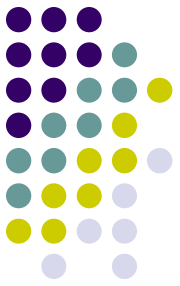
April 20, 2005

Context of the S&T Journal System Economics



- R&D funding is \$276 billion (2002)
- Total journal system costs \$45-50 billion
 - Authorship ~10%
 - Readers ~78%
 - Publishers ~ 6%
 - Libraries/other intermediaries ~ 5%
 - New initiatives ~ 1%
- Total system cost per scientist about the same as in 1975

Trends Affecting Journal System Economics



- Publisher portfolios increase in size
- Journals increase in size
- Electronic publishing takes hold
- Value-added features become available
- Author payments diminish
- Journal print subscription prices spiral upward

Trends Affecting Journal System Economics (cont'd)



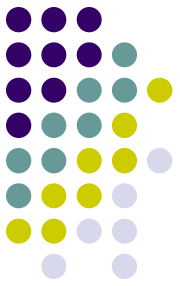
- Print demand drops appreciably
- Licensing/"big deals"/consortia purchasing are initiated
- Libraries begin shifting to electronic collections
- New models/approaches are examined
- Information-seeking and reading patterns change dramatically

Publishing Economics



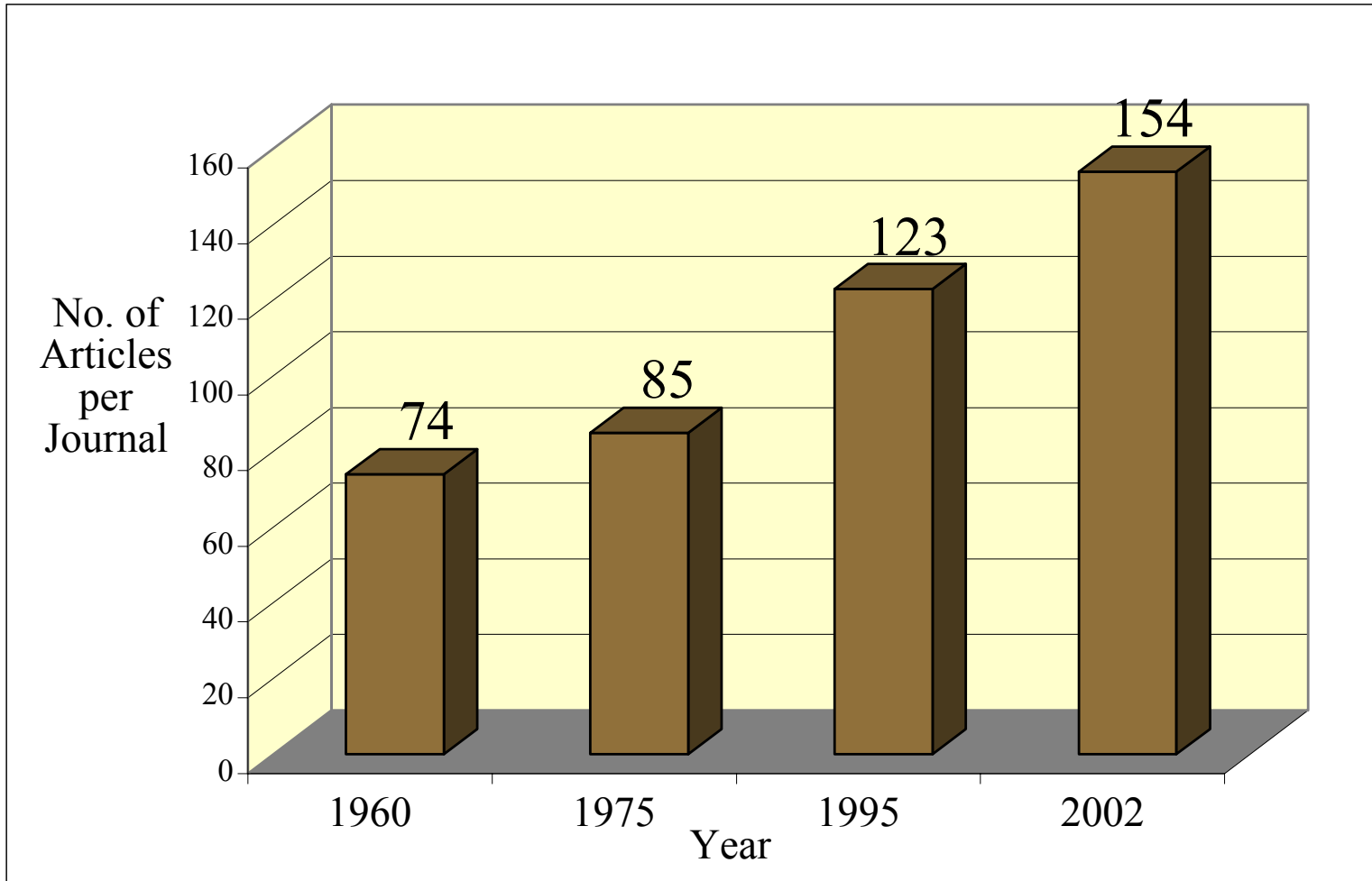
- Cost components
 - article processing (1st copy)
 - non-article processing
 - journal access/distribution
 - support/indirect activities
- Prices of print journal subscription “skyrocketed”
- Demand for subscriptions dropped as a result
- Therefore, prices had to increase more

Examples of Publishing Cost

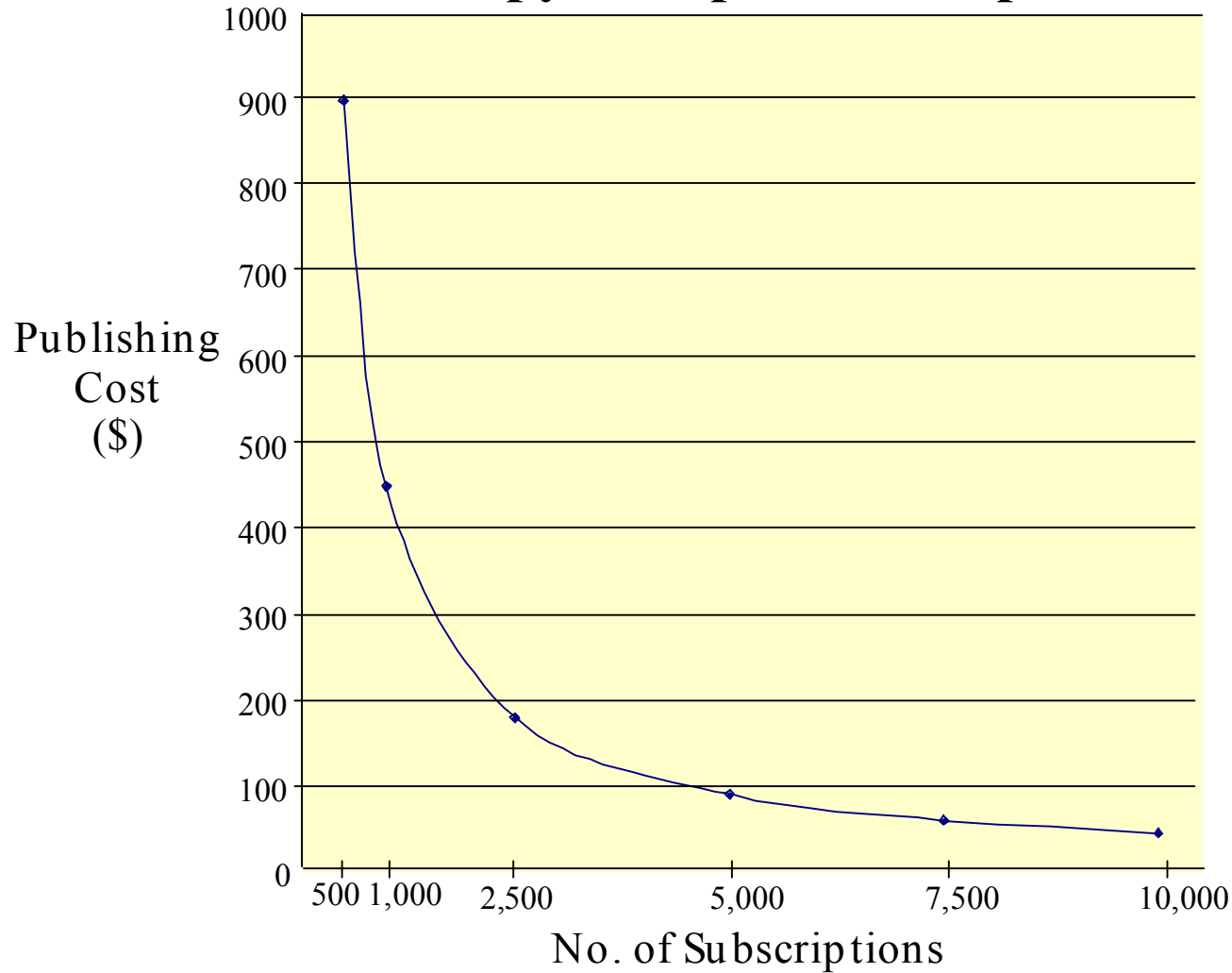


- Print Reproduction & Distribution -
\$30-\$50 per subscription
- Article Processing (1st Copy Cost) -
\$500 to \$8,000 per article
- Most Established Publishers - \$3,000 per article
- Article Processing Similar for Print & Electronic

Increase in Articles Per Journal (1960-2002)



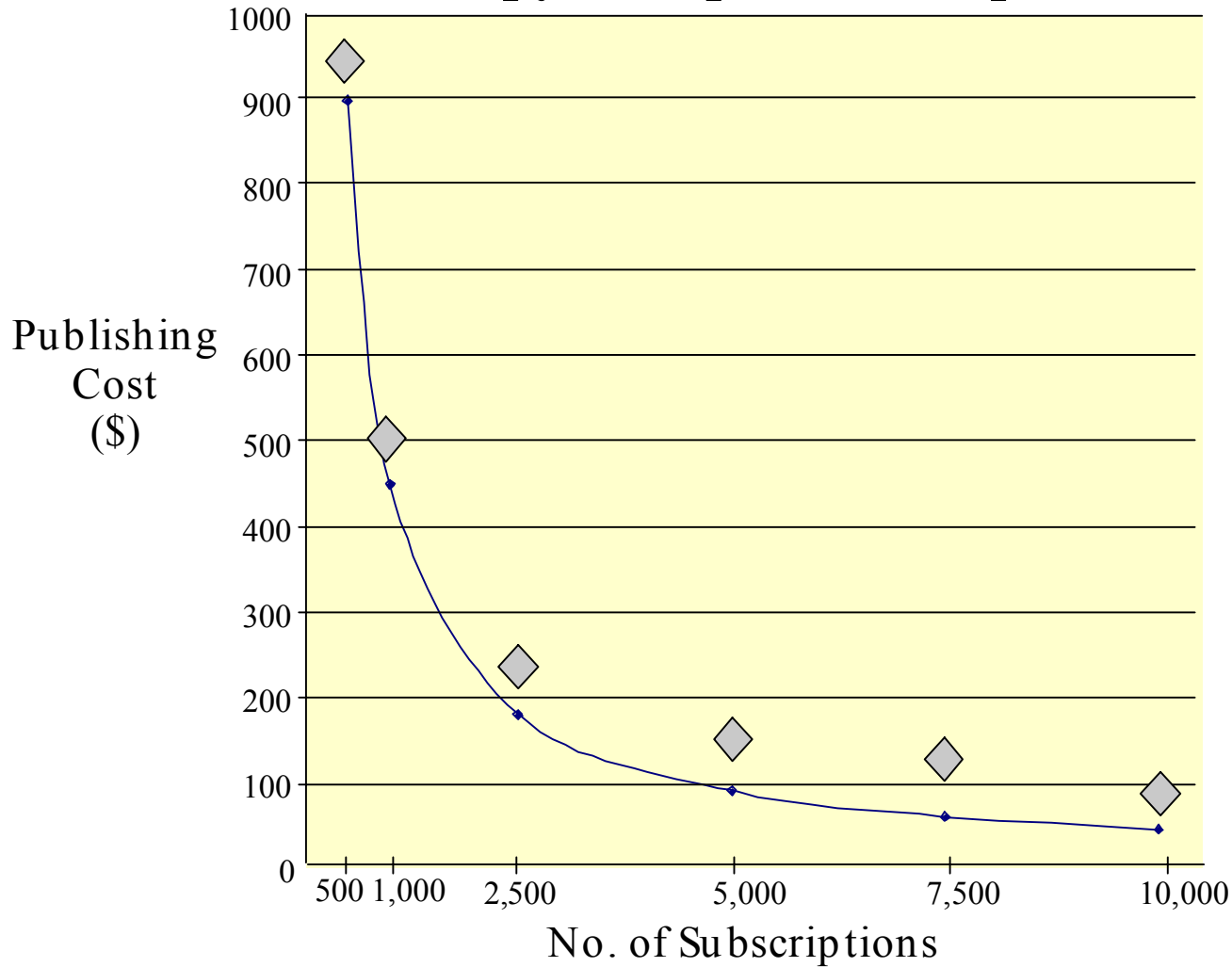
Journal Article Processing/ 1st Copy Cost per Subscription



Assumptions:

- \$3,000 for article processing
- 150 articles in journal
- \$450,000 total annual cost

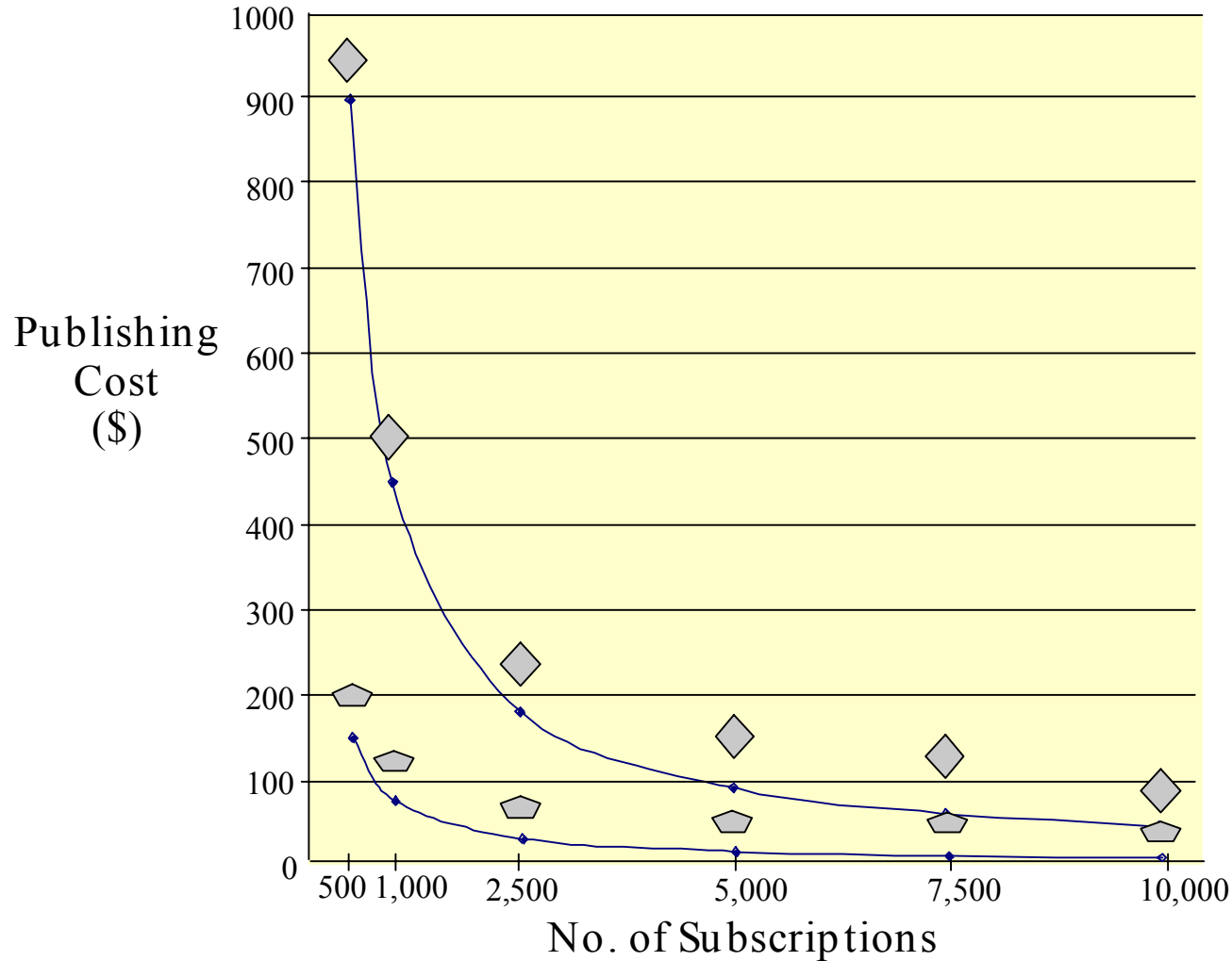
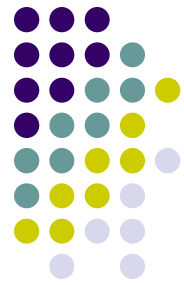
Journal Article Processing/ 1st Copy Cost per Subscription



■ Assumptions:

- \$50 for reproduction and distribution

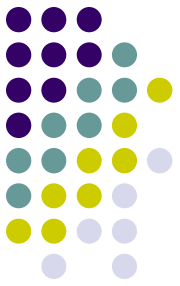
Journal Article Processing/ 1st Copy Cost per Subscription



■ Assumptions:

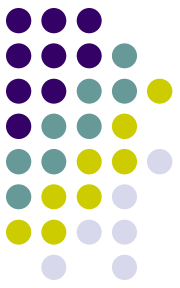
- \$500 for article processing
- 150 articles in journal
- \$75,000 total annual cost

Reasons for Spiraling Price Increase (1975 to 1995)



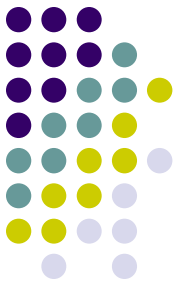
- Increased size of journals
- Reduction in circulation
- Reduction in author fees
- Increased size of publisher portfolios
- Addition of new journals
- Other factors

Library Cost of Print and Electronic Journal Collections

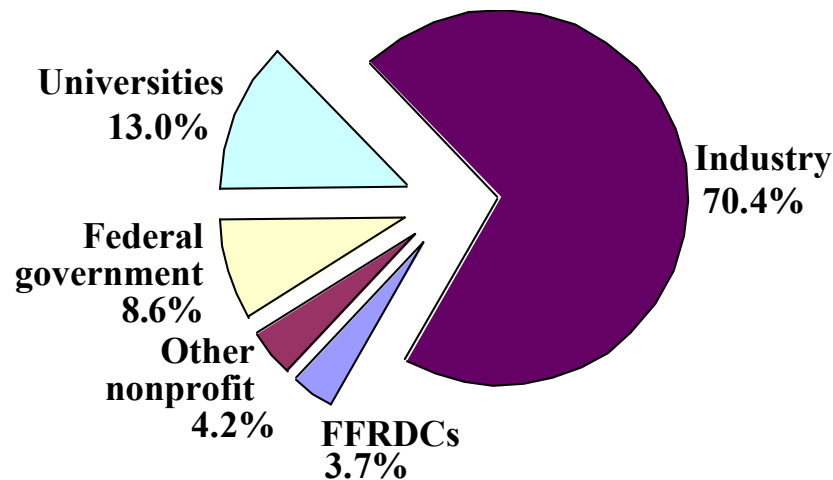


- Operational Processing Costs: Print nearly double the electronic cost per title
- User-Related Costs: Electronic about 25% higher than print cost per user
- Use-Related Costs: Print about double the electronic cost per use
- 25-Year Life-Cycle Costs: Print over 3 times electronic cost per title
- Generally: Print is 3 to 5 times the electronic cost per use

What is the S&T Environment in the U.S.?



- Total R&D funding in U.S. is \$276 billion.
- R&D budget performers:



- 7 million scientists in the U.S., but only 1.5 to 2.0 million FTE directly devoted to research
- Universities represent about 12 percent of scientists

Who are S&T Authors and Readers in the U.S.?



- About 75 percent of articles are written by university scientists
- About 25 percent of reading is in universities, 75 percent elsewhere
- Enormous use, usefulness and value of reading by scientists located elsewhere

Information-Seeking Patterns are Changing



- More reading per scientist
- Shift reading from personal subscriptions to library collections
- Factors creating change
 - Fewer personal subscriptions
 - Automated bibliographic searching
 - Electronic access
 - Introduction of licenses/“big deals”

Electronic Collection Contribution



- Personal subscriptions - 90% readings in print
- Library collections - 80% readings in electronic
 - Broadens journal availability
 - Saves readers about 20 hours per year
- Breadth of reading has increased
 - Read from about 13 journals in 1977
 - Over twice that amount now
- Age of article is a factor

Conclusions



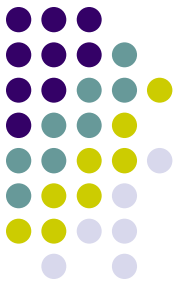
- Journal System Involves a Substantial Investment
- Technologies Have Become a Driving Force in Change
- One Must Examine Economic Costs of ALL Participants
- One Must Examine Economic Costs from Different Perspectives
- Transfer of Funds Among Participants
Unknown, but Critical in Understanding Change
- Impact Factors Only One of Many Needed Indicators

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