



Digital libraries: Economic issues

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ToC

- A few definitions & generalities
- Value of digital libraries
- Changing economic models
- Licensing
- Library consortia
- Open access
- Some economic data on digital resources
- Trends & concluding thoughts

Some economic generalities

Goods & services are analyzed in terms of:

- Value provided
 - tangible and intangible
 - e.g. value of information provided
- Expenditures, price, costs, budgets
 - figures, comparisons, calculations, trends, allocations
 - e.g. expenditures for digital resources by libraries; change over time; prices of given resource such as journals

more generalities ...

Economic analysis can be done on different levels:

- **Macroeconomics – the big picture:**
 - performance, structure, & behavior of a large economy as a whole e.g. national, or a branch, such as scholarly publishing
- **Microeconomics – the focused picture:**
 - how individuals, households, firms, organizations make decisions to allocate limited resources e.g. libraries

Value in economics

Adam Smith “father of economics”

“The word VALUE it is to be observed has two different meanings, and sometimes expresses the utility of some particular object and sometimes the power of purchasing other goods which the possession of that object conveys. The one may be called “value in use”; the other, “value in exchange.” “

Adam Smith (1776). *An inquiry into the nature and causes of the wealth of nations*. [great many reprints to this day]

Ch. IV. *On the origins and use of money*.

Capitalization in the original

For libraries - including digital ones

- *Value in use* probably more significant
 - What did users get from using a library and its services?
 - How did the library support mission of the larger institution, community?
- *Value in exchange* more directly tied to \$\$\$
 - Funders (e.g. university administrators) ask: what did we get for our money?

Value of libraries – including digital ones

Value in use: related to value of information in information society

- where the creation, distribution, diffusion, use, & manipulation of information is a significant economic, political, and cultural activity

Value in exchange: Hard to establish, but constantly explored

- traditional market valuation not pertinent
 - e.g. return on investment (ROI) hard to do, but sometimes tried as in Mezick (2007)

Establishing value of libraries

- Value added often invoked:
libraries add & enhance value to information & inf. objects by:
 - selection, organization, storage, access provision, preservation ...
- Treated as public good (as opposed to private good)
 - consumption of the good by one individual does not reduce the amount of the good available for consumption by others
 - often subsidized

Value in use

“Value of a library and information service is an assessment by users (or user surrogates) of the qualities of an interaction with the service and the worth or benefits of the results of interaction, as related to the reasons for using the service.”

Saracevic & Kantor (1997)

Big picture: Economic models & realities changing in digital world

- For libraries
- For publishers
- For institutions
- Even for users
- New economic models are being developed, tested, changed, abandoned
- Changes are sometimes evolutionary, other times revolutionary

Economic change for libraries: from ownership to license

Traditional model

- Traditionally, libraries **owned** the publication (books, journals, maps, records ...)
- They did NOT own the content but physically owned the object

New model

- Now: in most cases digital publications (particularly journals) are **not owned** by libraries
 - they license access from the publisher
 - they do not own the object any more

Economic change for libraries

From:

- From buying **ownership**
- Stuff was
 - on library's shelves
 - in a library's building
- Owned forever or till disposed

To:

- To buying **access**
- Stuff is on
 - somebody's else's "shelves"
 - somebody's computer, where? who cares?
- Access available till license valid & paid
 - then puff into thin air

Economic changes for publishers

From:

- Selling **objects**:
 - direct sales
 - subscription

To:

- Selling or licensing **access** – rights to use
 - Various charging schemes:
 - pay per article
 - direct electronic subscription
 - licensing access to a set (basket) of publications (called “big deal” in library parlance)

Even changes in how publishers count

Traditional model

- Statistics have changed significantly
 - used to be based on subscriptions
- No. of subscriptions to individual journals not stressed any more
 - even not possible – they are in a basket

New model

- No. of **full text downloads** became important indicator
- Publishers collect & aggregate statistics
 - shown as use of journals
 - economic justification
- Libraries gather statistics (from publishers) on no. of visits & downloads to journals
 - indicate & justify value

Subscription vs licensing

- License agreements, rather than outright sales, have become an accepted and prevalent means for publishers to provide their products to libraries
- Individual subscriptions, including library subscriptions are fading away for publishers & libraries
- Licensing access, particularly “big deals”

Bundling & “big deals”

enter economy of scale for digital works

- Publishers or aggregators bundle multiple serial publications into a single access license
- Offers some efficiencies
- Bundling pricing strategies emerged & negotiated
- Libraries may be pressured into getting items they do not want
- But then they also get those they never had – particularly small libraries
- Various critiques, e.g.
 - potentially restricting access to non-bundled items – smaller publishers
 - leaves libraries with few \$\$\$ to purchase other journals
 - price discrimination

License: a legal & economic instrument

- Permission to do something which, without such permission, would be illegal.
 - For example, a license to use digital information gives the **Licensee** permission to access and use the information under the terms and conditions described in the agreement between the **Licensor** and the **Licensee**
- **Site License**
 - A particular type of **Licensing Agreement** that permits access and use of digital information at a specific site for own users only

Licensing information

- [Liblicense](#) – Licensing Digital Information – A Resource for Librarians (at Yale)
 - model licenses; licensing terms & descriptions, discussions; licensing resources; software, vocabulary ...
 - rich and very useful
- [International Coalition of Library Consortia](#) (ICOLC)
 - An international, informal group currently comprising over 200 library consortia in North & South America, Europe, Australia, Asia, & Africa.

Library consortia

- A cooperative arrangement among groups of libraries or institutions representing libraries
 - primarily established for resource sharing & cooperative acquisition
 - working through consortium members can achieve more than working individually
 - some have broad programs, but most concentrate on licensing digital information resources
- **Consortia are primarily about economics**
 - bigger economic muscle in bigger numbers

Library consortia: economic power of scale

Marginal costs of distribution are small and thus the economies of scale are substantial

- In the US: Complicated patchwork of consortial membership around the country
- Consortia can drive a harder bargain than individual library
- Consortia evolved to provide access to all kind of electronic resources – e.g. databases; training & other functions

Examples of library consortia – US & international

- [VALE NJ](#)
 - over 50 academic libraries
- [OhioLINK](#)
 - over 120 Ohio college and university libraries, & State Library of Ohio
- [LYRASIS](#) (formerly NELINET)
 - academic, public, & special libraries in some 25 states
 - more than a consortium

International:

- [British Columbia Electronic Library Network \(BC ELN\)](#)
- [South African National Library and Information Consortium \(SANLiC\)](#)
- [Consortium of Swiss Academic Libraries](#)

Another economic model: Open Access (OA)

- Electronic materials are the result of substantial financial investment by public funds (e.g. NSF, NIH) & intellectual investment by individual scholars and authors & their institutions.
- Argument: Results should be openly available
- Free to use
- But subsidized or paid to establish for open access
- Paying at the source rather than destination

Open access goals

Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities

“Our mission of disseminating knowledge is only half complete if the information is not made widely and readily available to society. New possibilities of knowledge dissemination not only through the classical form but also and increasingly through the open access paradigm via the Internet have to be supported. We define open access as a comprehensive source of human knowledge and cultural heritage that has been approved by the scientific community.”

Open access links and resources

Subscription or access licensing vs. open access: who pays?

- In subscription or licensing at the **exit end:**
 - the user (or the user's institution such as a library) pays
- In open access at the **entrance end:**
 - the author (or institution or funders of the author) who desires to be published pays
- Users get free access

But, there is no such thing as a free lunch!

Open access (OA) main problem: Economics: Who pays?

- “Green” road to OA:
 - **Self-archiving:** authors publish in a subscription journal, but in addition make their articles freely accessible through a **digital repository** - an institutional or a central repository or archive (e.g. [DSpace at MIT](#), [PubMed Central](#))
- Depositor institution pays for depositing and access
- “Gold” road to OA:
 - authors publish in **open access journals** - articles freely accessible online immediately upon publication – e.g. [Public Library of Science](#)
- Open access journals sometimes charge authors or their institutions
 - often subsidized by governments or others

Author fees in open access journals

- Authors (or their institutions) are asked to pay a fee – at times waived
- Depending on given journal charge per article:
 - For [PLoS journals](#) \$1495-\$2900
 - For [BioMed Central](#) \$1140-\$2,240
 - [Optics Express](#) charges \$750 for articles 10 pages and under, and up to \$1350 depending on journal
- Some journals have page charges & open access options:
 - [NAR charges](#) \$ 1385 for member institutions & \$2770 per article for non-member.
 - [PNAS](#) charges \$1,125 to \$1,825. “Authors of research articles may pay a surcharge of \$1,350 to make their paper freely available through PNAS open access option. If your institution has a site license, the open access surcharge is \$1,000. All articles are free online after 6 months.”

JSTOR – another economic model for scholarly journals access

- Not-for-profit project but economic self-sufficiency - trusted archive of important scholarly journals
 - over 1000 journals plus other materials
 - for most a gap from 1 to 5 years, between the most recently published journal issue and the back issues in JSTOR
 - became a service of [ITHACA](#) together with [Portico](#) a digital preservation (archiving) service for scholarly journals
- Economic model: different prices for different classes of participants
 - different strokes for different folks model
 - distribute the costs of the endeavor in a fair way over as many types of institutions
 - uses The Carnegie Classification of Institutions of Higher Education; factors in the FTE enrollment of each institution

Public access – extension of open access

- Granting agencies pay for conduct of research
 - that produces publications
 - submitted to publishers of journals
 - and publishers take copyright
 - and charge for access
- Thus the argument: results of publicly funded research should be publicly available
- Basically not only an access, but even more so an economic argument

Public access: National Institute of Health initiative

“shall require that all investigators funded by the NIH submit or have submitted for them to the National Library of Medicine’s PubMed Central an electronic version of their final, peer-reviewed manuscripts upon acceptance for publication, to be made publicly available no later than 12 months after the official date of publication ...”

Policy on Enhancing Public Access to Archived Publications
Resulting from NIH-Funded Research (by law)

Attacks on open & public access – it is all about money

- Association of American Publishers (AAP) is against initiatives concerning access to federally funded research (public access) and open access
 - founded [PRISM](#) (now Professional Records & Information Services Management – formerly Partnership for Research Integrity in Science & Medicine) a trade association
 - conflate public access to federally funded research with government censorship & destruction of peer review
- Against: Association of Research Libraries [briefs](#)

Moving to microeconomics

- What are the costs of digital resources to libraries – particularly digital journals?
- How do they compare with costs for print journals?
- How did library budgets change in expenditures for digital resources?
 - size of the pie is the same, if not shrinking, but how much does it go for digital?

Economic data

- Not easy to come by
- One source: [Assoc of Research Libraries \(ARL\)](#) [annual statistics reports](#)
 - currently 125 members in North America
 - established in 1932
- Other sources: few articles & [Council on Library and Information Resources \(CLIR\)](#) reports includes [Digital Library Federation](#)

Serials crisis

- Journal prices over the past two decades or so keep increasing way out of proportion of book increases and Consumer Price Index
 - causing imbalances & severe strains on library budgets
 - and trying to find solutions such as open access
 - a growing movement
- Many factors, primarily associated with publishers, contribute

Growth of e-serials expenditures

Total Electronic resources expenditures were:

\$301,699,645 (111 libraries reporting) in 2003-04; &

\$856,151,217 (113 libraries reporting) in 2010-11

– for e-serials was \$270 mill & \$766 mill respectively

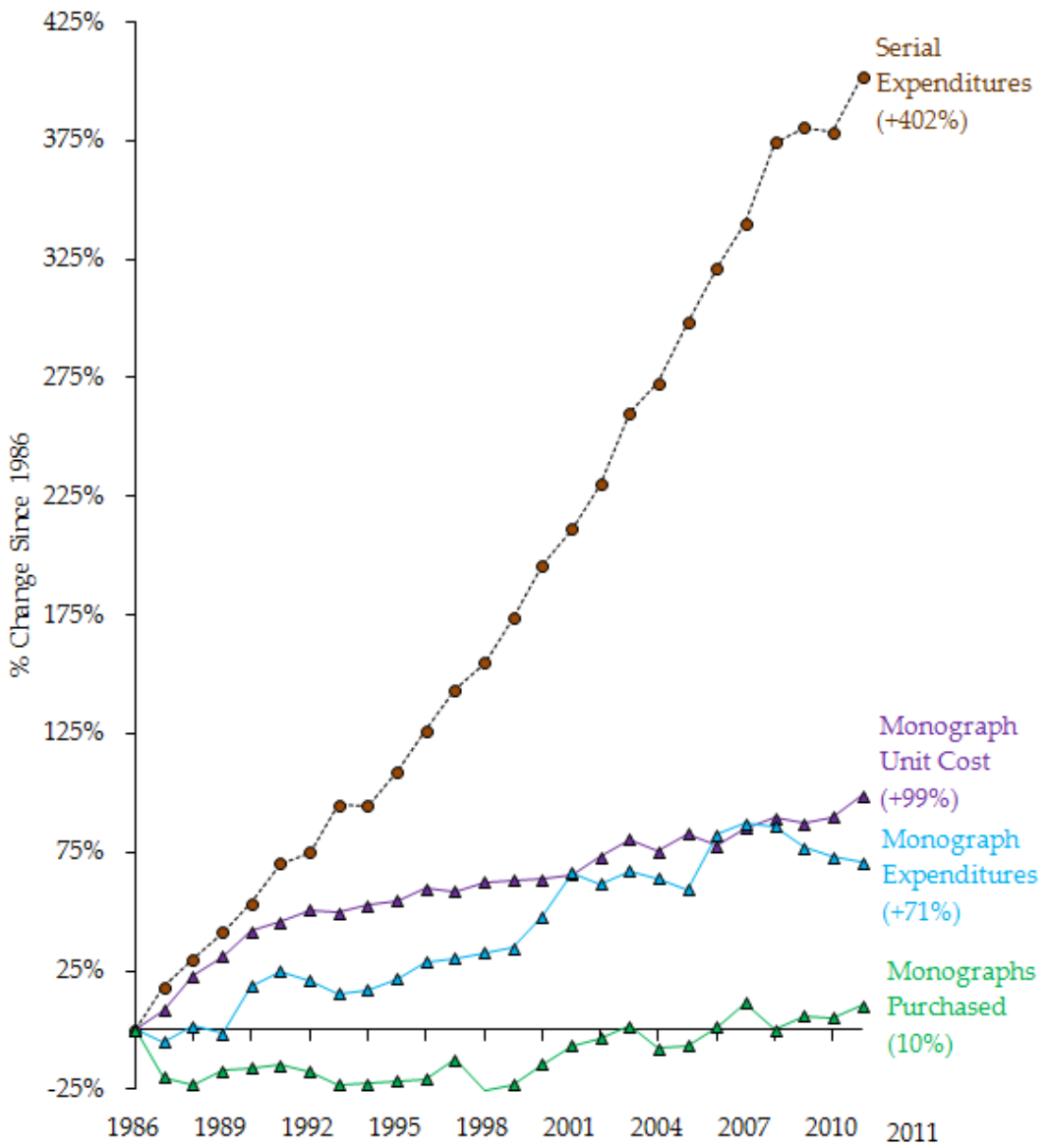
(ARL report 2010/2011 – last report that has separate data for electronic resources – now included in Total Materials Expenditures)

- Indicator of explosive growth of expenditures for digital resources

- p.s. ARL calls them “electronic resources” & “e-serials” rather than “digital”

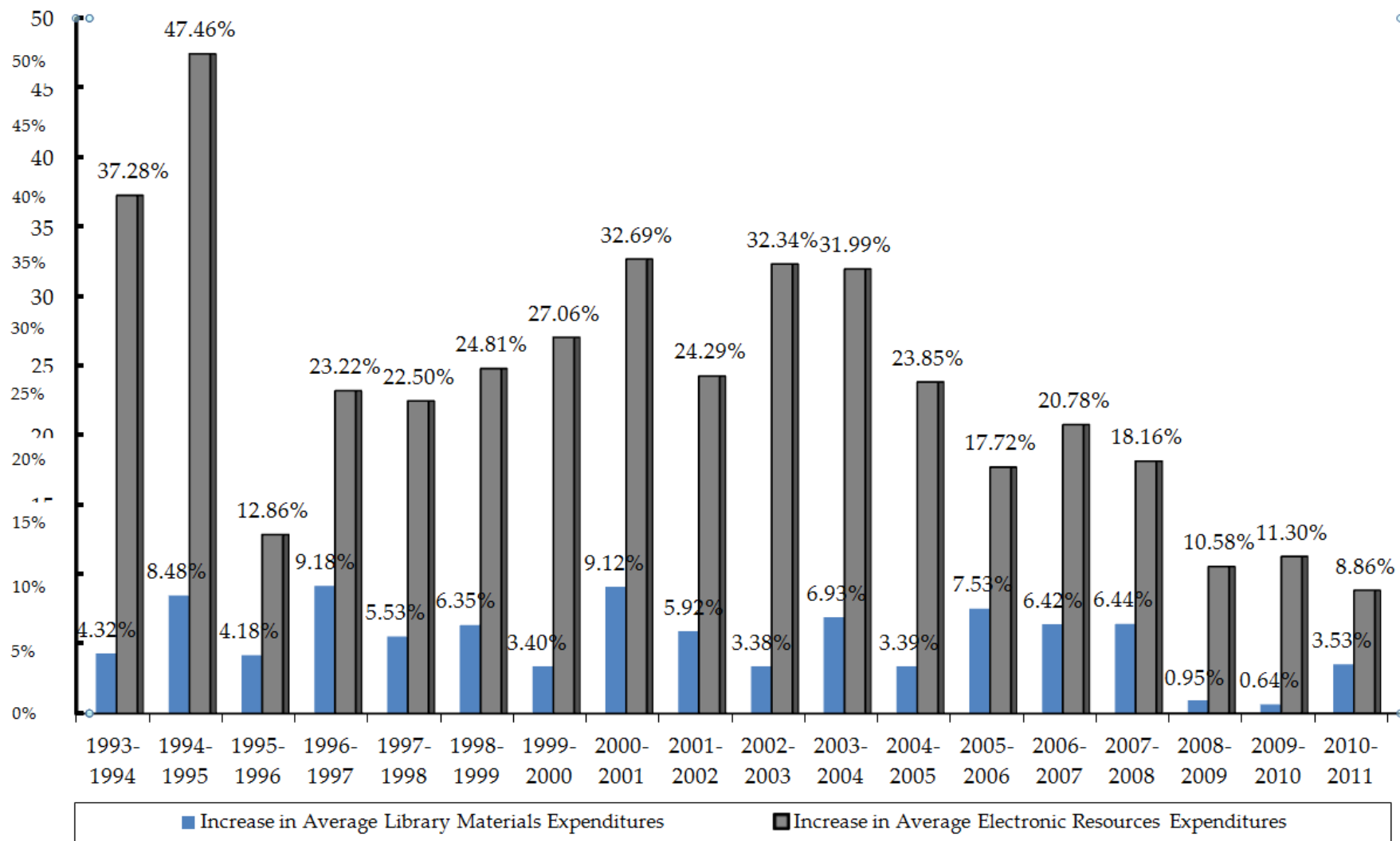
Monograph and Serial Costs in ARL Libraries, 1986-2011*

ARL: Growth of costs & expenditures (3 slides)



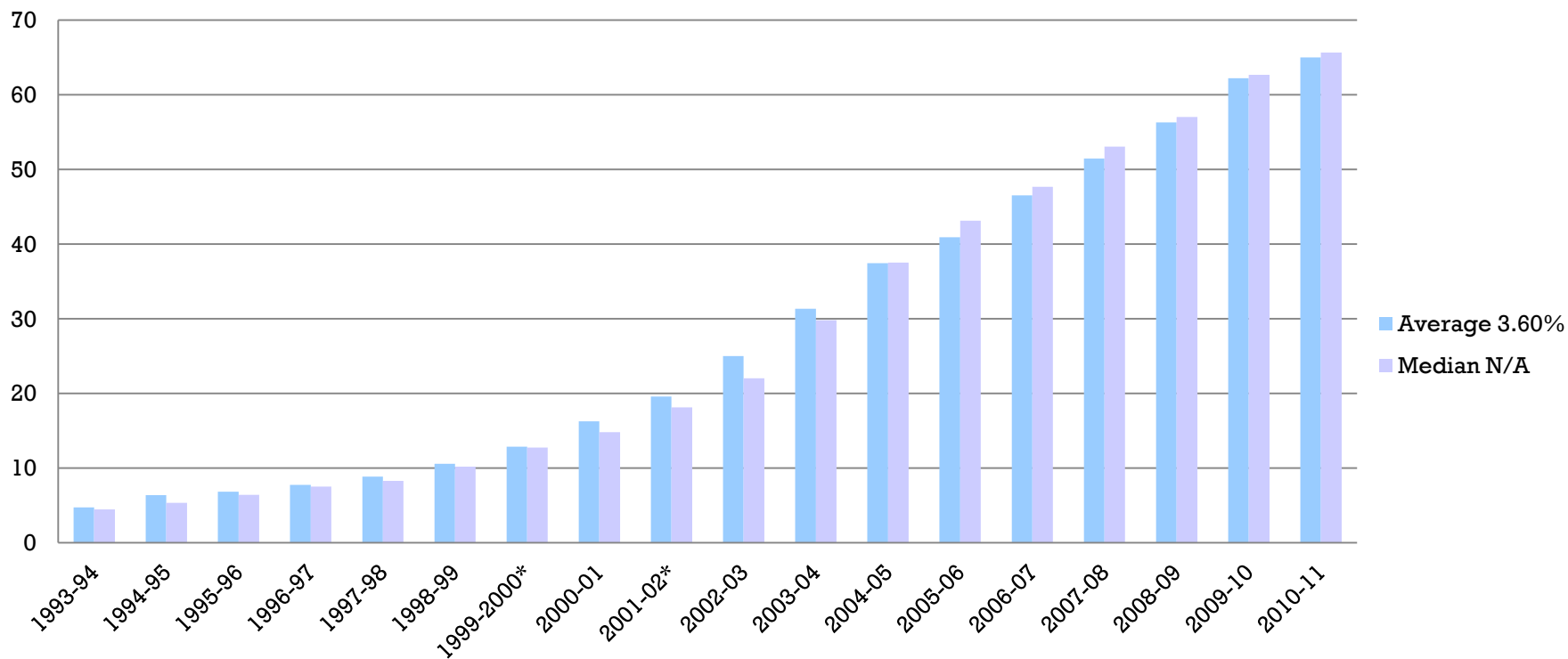
Source: ARL Statistics 2010-11 Association of Research Libraries, Washington, D.C. *Includes electronic resources from 1999-2000 onward.

Electronic Resources vs. Total Materials Expenditures, 1993-2011
Yearly Increases in Average Expenditures



Growth (cont.)

Electronic Resources Expenditures as a Percent of Total Materials Expenditures



ARL member libraries reporting: 82 in 1993-94; 105 in 1999-2000; 113 in 2011-11

Interpretation

ARL Statistics 2010-11

The percentage of acquisitions dollars that ARL member libraries devote to electronic resources has risen from 3.6% in 1992–93 to 12.9% in 1999–2000 to 65.03% in 2010-11.

Trend

- Large rise in expenditures for electronic resources over the past few years
- Increase in percent of materials budget that is spent for electronic resources
- But there are significant differences among libraries
- *Note: these statistics are **only** for ARL libraries – now 125 libraries; public & other academic libraries NOT included*

Are there economic advantages in digital?

- There may be significant cost advantages to moving away from print collections and toward electronic collections

Conclusion from

[CLIR research report:](#)

“The Nonsubscription Side of Periodicals: Changes in Library Operations and Costs between Print and Electronic Formats”

more study conclusions ...

- There is strong reason to conclude that the electronic format brings a reduction in the nonsubscription costs of periodicals across the board.
- The potential savings are most pronounced at the smaller institutions
- Each year, a library that has transitioned to the electronic format for periodicals may have the opportunity to avoid immediate costs and long-term financial commitments as high as several hundred thousand dollars

Paradox?

- As print subscriptions **rose** to create a crisis
 - cost of ownership up
- Libraries spending less & less on print subscriptions – dropping them
- Publishers offering premium for dropping print & going to digital
 - want to get out of print
- Licensed access cost per journal **fell**
 - cost of access down
 - but journals in a basket – no pick & choose
- No more ownership
- License prices consortia negotiated
- Archival costs
????

Toward conclusions

- Digital resources are drastically changing economics & economic models for all stakeholders
 - libraries
 - publishers
 - funders
 - users
- Digital economics are different
 - with what consequences?

In libraries

- Percentage of materials budgets allocated for digital resources is rising & rising
 - not the same for all kinds of libraries
- But the budgets are not rising commensurately
 - what gives? with what consequences?
- However, are we getting more bang for a buck?

Trend: open access

- Digital world allows for wide access –push for open access follows this
 - “green” road for open access archiving
 - becoming mandatory for government-funded research (US, UK, possibly EU)
 - “gold road” for open access publishing
 - immediate & open availability
- Faces strong opposition by powerful stakeholders – becoming a battleground

Open questions

- But who pays? How? When?
- Subsidies?
- Where does the buck stop?
- Many economic issues unresolved
- They are also political and policy issues much larger than digital libraries
- Libraries and librarians are deeply involved & **must** get involved

Back to the big picture: Information ecology

- Stakeholders in creation, distribution, diffusion, use, preservation & manipulation of information form an **ecology** - they interact like a living system
 - changes in one part affects other parts
- Libraries are part of this ecology
- Currently, this ecology is changing with many effects on libraries
- Economic effects are significant

Economics of digital resources



stirring up a hornets' nest

Lecture in Wordle

