Library Investment Index—Why Is It Important?

Brinley Franklin
University of Connecticut, USA

Colleen Cook
Texas A&M University, USA

Martha Kyrillidou
Association of Research Libraries, USA

Bruce Thompson
Texas A&M University and Baylor College of Medicine, USA

Abstract

The Association of Research Libraries(ARL) has engaged in the implementation of the Task Force on New Ways of Measuring Collections' recommendations and developed a new index, the Library Investment Index, originally called the 'Expenditures-Focused Index' which was published in the *Chronicle of Higher Education* for the first time in 2007. The Expenditures-Focused Index was renamed the Library Investment Index in 2008 to better reflect the notion that library expenditures are reflective of investments in intellectual, scholarly, and community capital. This paper offers a closer examination of the implications of the Library Investment Index and discusses its importance for the research and wider library community. It addresses both the methodological advantages and limitations as well as the political significance of the development of this index.

Introduction

In an environment where physical library collections are being replaced or supplemented by terabytes, petabytes, exabytes, zettabytes, and yottabytes of information, it is questionable whether the units of volumes held, volumes added, and serial subscriptions can continue to offer the utility they had in the past. The challenge of measuring collections in new ways gave rise to the work of the Association of Research Libraries (ARL) Task Force on New Ways of Measuring Collections which engaged into a two year process and moved from debate to action on these issues. The Task Force[1] was convened in December 2004 and built on much of the earlier work and debates that engaged the ARL directors during the 1990s.[2]

During its two-year investigation, the task force systematically collected qualitative feedback through one-on-one interviews with nearly every ARL library director. During the second year of its operation, the task force deployed two top researchers in qualitative and quantitative methodologies, Yvonna Lincoln and Bruce Thompson. Two reports were produced for the ARL community: "Research Libraries as Knowledge Producers: A Shifting Context for Policy and Funding,"[3] documenting the results of the qualitative inquiry, and "Some Alternative Quantitative Library Activity Descriptions/Statistics That Supplement the ARL Logarithmic Index," documenting the results of the quantitative inquiry.[4]

ARL Task Force on New Ways of Measuring Collections: Interview Results

During interviews conducted by Task Force members with more than 100 of the 123 ARL directors in the spring and summer of 2005, a number of key issues surfaced that needed to be addressed. Themes from these interviews highlighted that:

- Data is not expressing uniqueness of materials;
- Relevance to teaching, learning, research is not adequately reflected;
- Collections go beyond printed volumes;
- Research library is more than collections—it

includes its services and ARL is not telling the story with the ARL Membership Criteria Index;

- Increase in expenditures for electronic resources is changing collections;
- Ownership and access are not contradictory approaches;
- Consortial relationships/cooperative collection development is increasingly important;
- Shared storage facilities are a necessity;
- Duplicate serials based on bundling is a huge problem for research libraries since quality control issues vary from product to product;
- Special collections are not reflected in our current statistics; and
- ARL Membership Committee does not use the Membership Index exclusively like it used to in the past; it also takes into account qualitative indicators now.

Many directors recognized the historical significance of the long standing ARL Statistics[5] dataset to show trends, as a way of accounting for university investments, and its importance for comparison and benchmarking. But the voices expressing serious concerns with the ARL Membership Criteria Index were clear in that the Index was misunderstood, misleading, and unhelpful.

During the second year of the investigation, Bruce Thompson was engaged and did an exhaustive and thorough analysis of the ARL Statistics data set, attempting to identify additional patterns in the data though factor analysis. In his analysis, he confirmed the statistical validity of the ARL

Membership Criteria Index and suggested an improved alternative, what came to be known as the Library Investment Index (or Expenditures-Focused Index).

Task Force Recommendations

In February 2007, the result of the two year investigation of the Task Force resulted in the formation of an action agenda approved by the ARL Board of Directors, the ARL Task Force on New Ways of Measuring Collections, and the ARL Statistics and Assessment Committee. The action agenda has a number of R&D components but it stands as a practical approach to support research libraries as they are transforming their operations from what has been a 20th century approach into a 21st century approach.

The practical and political readiness of different research libraries to adopt new ways of describing their operations varies and is presented in Figure 1. The action agenda offered a wise compromise that keeps what is valuable from the past and also helps libraries move boldly into new territory. A conscious decision was made to maintain the ARL Membership Criteria Index for institutional purposes but not publish it in the *Chronicle of Higher Education (The Chronicle)* as it contains variables like volumes held, volumes added gross and current serial subscriptions that are undergoing transformative changes. For a stable way of describing libraries, the Task Force relied on the expenditures variables, and promoted and published it in the *Chronicle of Higher Education* the Library Investment Index.

Figure 1. New Ways of Measuring Collections: An Action Agenda Adopted February 2007

1. Reserve use of the current membership criteria index for those occasions when it is needed for consideration of membership issues.
2. Implement an expenditure-focused index.
3. Use the new expenditure-focused index for any public reports, such as in the Chronicle of Higher Education.
4. Begin to develop a services-based index that combines the following three factors: collections, services, and collaborative relationships.
5. Revise definitions for collections-related data categories currently collected and experiment with a variety of new measures, including usage data, strength of collections, and service quality measures to develop a richer set of variables for potential inclusion in the three-factor alternative index (see above).
6. Collect qualitative data to develop a profile of ARL member libraries.

Figure 2 presents the variables that are comprising the ARL Historical or Membership Criteria Index and the Library Investment Index. A special note is made here regarding the naming convention of the ARL Historical or Membership Criteria Index. Although the ARL Membership Criteria Index was historically used to determine membership, this is not the case any more as the membership criteria have been supplemented with qualitative indicators. Currently, the ARL Membership Criteria name is more a reflection of the history of the old practice of determining membership based on the index. It is used as only one indicator among many others to be taken into consideration when identifying potential candidate institutions for membership to ARL. Thus, we interchangeably refer to the ARL Membership Criteria Index as the Historical Criteria Index in this paper. The indicators that supplement the Historical Criteria Index are qualitative in nature and to date they have not been tested in an affirmative way as ARL has not accepted any new member libraries based on the combined (qualitative and quantitative) criteria. The new Library Investment Index is yet another way to supplement these criteria with an objective approach when considering potential members.

Figure 2. The Story of Two Indices

Historical Criteria Index or Membership Criteria Index	Library Investment Index (previously named Expenditures-focused Index)
• Volumes Held • Volumes added gross • Current Serials • Total Expenditures • Professional plus support staff	• Total Expenditures • Salary Expenditures • Materials Expenditures • Professional plus support staff

The Library Investment Index

As noted by Thompson in his report, the two indices correlate highly but there is a distinct advantage in using the Library Investment Index: "The use of a measure of total expenditures versus the use of some combination of (a) volume counts (historically part of the older statistics) and (b) expenditures on digital resources (only recently measured as part of the supplementary statistics) could (1) finesse the difficulty of distinguishing these two resources (2) while at the same time recognizing the changing face of the library in an increasingly digital world."[6]

In Figure 3, we report the correlations between the two indices and their ranks for the 2002-03 ARL Statistics showing that all correlations coefficients are very high. The same analysis was performed for every year between 2002-03 and 2006-07, and shows strong correlations.

Figure 3. Correlations between the ARL Membership Criteria Index and the Library Investment Index (formerly known as Expenditures-focused Index)
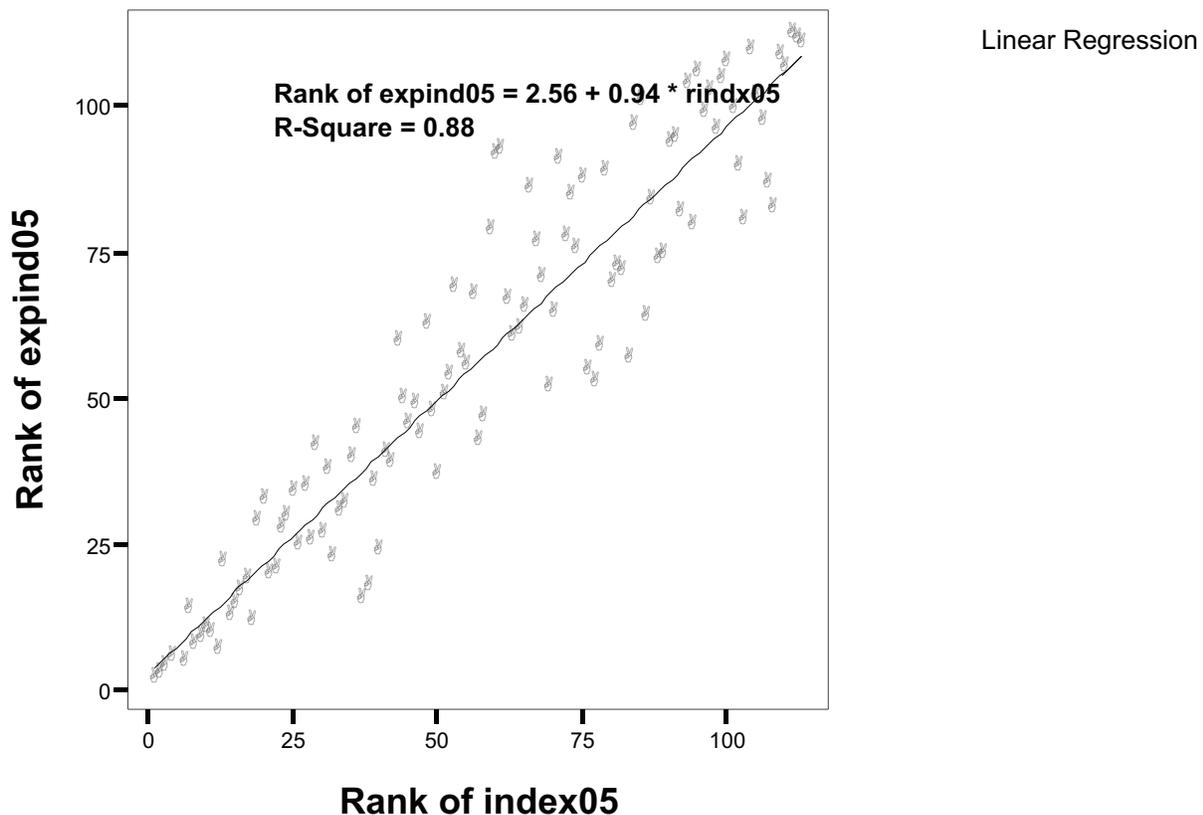
Correlations

		index03	rindx03 Rank of index03	expind03	re03 Rank of expind03
index03	Pearson Correlation	1	-.955**	.903**	-.911**
	Sig. (2-tailed)		.000	.000	.000
	N	113	113	113	113
rindx03 Rank of index03	Pearson Correlation	-.955**	1	-.785**	.943**
	Sig. (2-tailed)	.000		.000	.000
	N	113	113	113	113
expind03	Pearson Correlation	.903**	-.785**	1	-.817**
	Sig. (2-tailed)	.000	.000		.000
	N	113	113	113	113
re03 Rank of expind03	Pearson Correlation	-.911**	.943**	-.817**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	113	113	113	113

** . Correlation is significant at the 0.01 level (2-tailed).

Figure 4 demonstrates the regression line between the ranks of the two indices based on the 2004-05 ARL Statistics data and shows that the relation between these two is again very strong (R-square =.88).

Figure 4. Regression of Rank of the Library Investment Index and the ARL Membership Criteria Index

Linear Regression

Rank of expind05 = 2.56 + 0.94 * rindx05
R-Square = 0.88

Rank of expind05 (y-axis)

Rank of index05 (x-axis)

So, why is the Library Investment Index a better choice? As can be seen from Figure 5, the ARL Historical or Membership Criteria Index as calculated using the Principal Component Analysis Method every year has an Eigenvalue that is lowering each year, year after year. The underlying factor is undergoing a gradual transformation primarily due to the serial subscriptions, volumes held and volumes added gross data.[7] As collections are transforming, the Historical Criteria Index is capturing this evolution alas resulting in a less robust indicator over time. The variance explained has been lowered from 90.5% in 2002-03 to 81.7% in 2006-07 (Figure 5). The Principal Component Analysis of the Library Investment Index on the other hand explained more than 92% of the variance and is stable over the same time period.

Figure 5. How Is the ARL Membership Criteria Index Changing?

ARL Historical Criteria Index (previously named ARL Membership Criteria Index)		
Variance Explained from Principal Component Analysis		
	Eigenvalue	% of Variance
2002-03	4.53	90.50
2003-04	4.46	89.23
2004-05	4.40	87.94
2005-06	4.39	87.94
2006-07	4.08	81.70

External research also confirms that library expenditures relates to factors like institutional reputation. Sharon Weiner, Dean of Library Services, University of Massachusetts Dartmouth, published "The Contribution of the Library to the Reputation of a University"[8] where she explores the relationship between a peer-assessed reputation rating for doctoral universities with cross-institutional performance indicators for universities and their libraries, using the ARL Statistics among other sources. Weiner finds that library expenditures is the only consistently significant variable in this relationship. These findings are supportive of the ARL direction to make publicly available the Library Investment Index (formerly known as Expenditures-Focused Index).

Conclusion

Clearly 'measuring the size of library collections cannot be what it used to be.'[9] The continued work of collecting profile descriptions from ARL member libraries[10] as well as the potential of developing a three-factor index[11] hold promise for richer and more fulfilling ways of capturing the value of research libraries. Currently, we have a rich array of assessment tools which continues to be supplemented with new efforts and explorations describing effective and successful library services.

Endnotes

1. ARL Task Force on New Ways of Measuring Collections Members:
   - Brinley Franklin, Chair (University of Connecticut)
   - Shirley Baker (Washington University, St. Louis)
   - Dale Canelas (University of Florida)
   - Colleen Cook (Texas A&M University)
   - Carol Pitts Diedrichs (University of Kentucky)
   - Eileen Hitchingham (Virginia Tech)
   - Mod Mekkawi (Howard University)
   - Lou Pitschmann (University of Alabama)
   - Alice Prochaska (Yale University)
   - Jennifer Younger (University of Notre Dame)

   ARL staff:
   - Julia Blixrud
   - Mary Jackson
   - Martha Kyrillidou

2. M. Kyrillidou and W. Crowe, "In Search of New Measures," *ARL: A Bimonthly Report* 197 (1998): 8-10, http://www.arl.org/bm~doc/newmeas-2.pdf; M. Kyrillidou, "Research Library Trends: ARL Statistics," *Journal of Academic Librarianship* 26 (2000):427-436; M. Kyrillidou, "To Describe and Measure the Performance of North American Research Libraries," *IFLA Journal* 4 (2001): 257-263; M. Kyrillidou, "From Input and Output Measures to Quality and Outcome Measures, or, From the User in the Life of the Library to the Library in the Life of the User," *Journal of Academic Librarianship* 28 (2002): 42-46; and M. Kyrillidou, "Library Assessment as a Collaborative Enterprise," *Resource Sharing and Information Networks* (special issue of on the theme "Creative Collaborations: Libraries Within Their Institutions and Beyond") 1/2 (2005/2006): 73-87, http://www.libqual.org/documents/admin/kyrillidou_haworth_sept72004.pdf.

3. Yvonna Lincoln, "Research Libraries as Knowledge Producers: A Shifting Context for Policy and Funding: Final Technical Report to the Task Force on New Ways of Measuring

Collections, Association of Research Libraries," Presented at the ARL Membership Meeting, October 18, 2006, http://www.arl.org/bm~doc/lincoln.pdf.

4. Bruce Thompson, "Some Alternative Quantitative Library Activity Descriptions/Statistics That Supplement the ARL Logarithmic Index," Presented at the ARL Membership Meeting, October 18, 2006, http://www.arl.org/bm~doc/bruce_3mk.pdf.

5. K. Stubbs, "University Libraries: Standards and Statistics," *College and Research Libraries* 42 (1981): 527-538; K. Stubbs, "On the ARL Library Index," Paper presented at the 108th meeting of Research Libraries: Measurement, Management, Marketing, Minneapolis, MN," 1986; K. Stubbs, "Lies, Damned Lies . . . and ARL Statistics?" Paper presented at the 108th meeting of Research Libraries: Measurement, Management, Marketing, Minneapolis, MN, 1986; K. Stubbs, "Apples and Oranges and ARL Statistics," *Journal of Academic Librarianship* 14 (1988): 231-235; K. Stubbs, "Access and ARL Membership Criteria," Proceedings of the 125th Meeting of the Association of Research Libraries, 1993, 117-122, http://www.arl.org/bm~doc/stubbs93.pdf; and M. Mekkawi, "The ARL Library Index as a Decision-making Tool," *College and Research Libraries* 43 (1982): 396-401.

6. Thompson, 19.

7. Martha Kyrillidou, "Reshaping ARL Statistics to Capture the New Environment" *ARL: A Bimonthly Report* 256 (2008) http://www.arl.org/bm~doc/arl-br-256-stats.pdf; Martha Kyrillidou, "The Impact of Electronic Publishing on Tracking Research Library Investments in Serials" *ARL: A Bimonthly Report* 249 (2006), http://www.arl.org/bm~doc/arlbr249serials.pdf.

8. S. Weiner, "The Contribution of the Library to the Reputation of a University." *Journal of Academic Librarianship* (2008), doi:10.1016/j.acalib.2008.10.003.

9. Kyrillidou, "Reshaping ARL Statistics to Capture the New Environment."

10. Lincoln.

11. Thompson.