Ratio Analysis Technique : A Tool for Assessing The Health of a Library

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Introduction

Any assessment of library has to be necessarily based on tangible quantitative data. 'How good a library' is pretty difficult to answer. 'What good it does?' is equally difficult to enumerate. At the same time answers to the question 'how big a library is ?' could be deceptive One can see numerous tangible and intangible variables contributing to make a library good and perform satisfactorily.

A figure on its own does not convey any useful meaning unless it is related to other relevent information. Ratio by bringing together two variables or a system makes it convenient to look for a meaning. In addition to indicating relationship between variables, ratio helps, to some extent, in quantitative and relative judgement or the system.

All attempts to set standards for libraries have always cautioned us not to use standards in isolation but to have contingency approach. On one hand variables such as population served, the size of parent organisation, the cost and number of books need to be bought do vary significantly from library to library. On the other hand, statistics as a double edged tool paints altogether different picture if adopted care lessly. A possible solution, at least in some of the cases, would be to explore arriving at meaningful ratios between two variables of the library and compare it with that of other similar libraries or with such ratios of the same library over a period of time. This process may also lead to set realistic standards for libraries. This paper attempts to show how RAT of Financial Management can be suitably adopted to assess the health of a library particularly in terms of the internal ratios based on the variables budget, space, staff, users, collection, annual addition (to collection) and use/loans.

Statistics, Standards end Ratios

Lot of statistics about libraries are flooded in annual reports, display boards, articles and conference papers. Many of them lack specific frame of reference, for

interpretation and comparison. A frame of reference or basis is a must to derive any meaning from statistical data. Statistics can be made highly deceptive; often it is misused and abused rather than objectively used. In order to make library statistics more objective and reliable, it is advisable to adopt ratios than presenting raw statistics.

Persistent efforts have been made by professional organisations, committees and experts to set quantitative standards for libraries based on past performance, work sampling data, time study data, standard time data and other measures. Experts opined that about 60% of library work is quantifiable. Hence, providing standards in the form of ratios wherever possible is highly desirable.

It is quite likely that a single ratio may convey very little meaning. Hence it is also desirable and profitable to compare it with some standards. Needless to say that choosing proper standards for comparison with ratio is most important. Standards chosen for comparison with ratios could be any one of the following :

(1) *Absolute Standards.* Absolute standards are set for performance of a library. They are quite often rules of thumb and hence the authenticity of such standards is questionable.

2 *Historical or Internal Standards.* Comparison of present performance of a library with that as of a particular point of time on earlier period lead to historical or internal standards Ratios of a single library computed over a period of time indicate trend of the library.

3 *Budgeted Standards.* Budgeted standards are nothing but the realistic projected or targetted performance. Ratios can be compared with planned or projected data, if any.

4 *Horizontal or External Standards.* Horizontal or external standards are concerned with the standards set for similar/comparable Libraries. Ratios of comparable libraries can be computed and interpreted to see relative performance of the libraries.

By and large, widely accepted standards on all aspects of libraries are not yet available. Lack of standards come in the way of interpretation of statistics of any library whether in the form of ratio or otherwise.

Ratio Analysis Technique

Ratio is a statistical yardstick which helps to measure the relationship between two variables. The relationship can be expressed as percentage or as a quotient. The

ratio analysis is the process of determining, comparing and interpreting ratios of certain meaningful quantitative data.

The technique is widely used in Financial Management where several ratios have been devised to assess the health of a business firm. Financial ratios have been grouped under several headings to emphasise the specific use of ratios

The ratio analysis is not totally new to librarians. Some attempts to set standards for libraries have already utilised ratios. For example, it is widely accepted that about 6% of the budget of a university or college 'needs to be spent on its library, library expenditure on staff and reading materials should be in the ratio of 3:2 and about 0.4% of circulation of books should be allowed as loss. However, RAT is not extensively used in libraries. Like financial ratios, library ratios also help to assess the performance of a library, predict the trend of a library, compare two similar libraries and finally ratios can be compared with standards to assess the health of a library.

Limitations of Ratio Analysis Technique

Before demonstrating computation and interpretation of some specific library ratios it is necessary to understand their limitations. By and large, the RAT is not foolproof. As a matter of fact over employing ratios just because they are simple to compute and easy to understand will lead to accumulation of mass of data without proper relevance. Some of the drawbacks of ratios are as follows :

1 *Ratio First or Standard First?* Eventhough ratio analysis helps setting standards for libraries, standards become pre-requisite for deriving meaning from stray ratios. Thus the success of ratio analysis in turn depends on availability of realistic standards. Even where standards exist, the comparison of different libraries becomes difficult due to limitations of standards. In other words it is at times difficult to decide proper basis for comparison of ratios

2 *Uniqueness of a library.* Each library has its own individuality and hence it becomes difficult to evaluate them by comparison due to multiplicity of factors affecting their performance.

3 *Lack of Common Understanding on Basic Units.* It is very common that definitions and data recording systems of libraries differ from one another. Many examples can be cited for this inconsistency in basic unit. What is called a 'report' or a 'volume' or an 'use' in a library may not be the same as in another library.

In this connection, it may be emphasised here that libraries should strive hard for setting and uniformly accepting definitions of basic units and data recording systems.

4 *Statistical Data are not Dynamic and Real Time.* Statistics are one time figures and they essentially ignore short term fluctuations. In addition, seasonal characteristics like initial, growing and saturated periods of a library have to be taken into consideration before interpreting ratios.

5 *Inability of Ratios to Measure Efficiency.* The RAT ignores the effiency of a library and service efficiency being an intangible factor cannot be measured or compared by ratios.

6 *Artificial Manipulation of Ratios.* Finally it is always possible to artificially improve ratios by inflating certain variables. In other words, ratios are very much prone to manipulation. To guard against such biases are extremely important.

Thus ratios are only symptomatic and all connected ratios should be examined before arriving at a conclusion. They provide clues and guides towards better or worse performance. An element of judgement and lot of skill are essential in selecting, evaluating and interpreting ratios.

Ratio Analysis for Libraries

One can identify seven major parameters/variables which substantially contribute to the performance/health of a library. They are budget, space, staff, users, collection, annual addition to collection, and use/loans. These seven variables taking two at a time result in 21 ratios. However, as shown in Table 1, five of them (marked -) appear to be less meaningful. Hence, one can arrive at 16 major ratios to any library from the above variables.

It may be noted that each one of the variable has several components which in turn results in several ratios among themselves as well as with other variables. For example, in case of budget, one can see budget for staff, reading materials like books, reports and journals, budget for furniture, budget for binding, etc. Hence, all ratios which include budget as one of the two components can be further extended to individual budget items and ratio between any two budget items (e.g. ratio of budget for staff to reading materials) can also be worked out.

All the above ratios can be called internal ratios of libraries as both variables are concerned with the library. But by considering one variable of the library and another factor external to the library like a variable of parent organisation it is possible to arrive at external ratios of libraries. For example, ratio of budget of the library to budget of the parent organisation quite commonly used in standards is an external ratio.

TABLE I   Major variables for deducting internal ratios for libraries

	Budget	Space	Staff	Users	Collection	Annual addition (to collection)	Use/ loans
Budget							
Space	—						
Staff	X	X					
Users	X	X	X				
Collection	—	X	X	X			
Annual addition (to collection)	X	—	X	X	X		
Use/loans	—	—	X	X	X	X	

Key : ×, Ratio is meaningful ; —, Ratio is not meaningful.

It may also be noted that the variables budget, annual addition to collection and use/loans are for specific period (i.e. one year) whereas all other variables are cumulative to a point of time. It is also possible to group and classify ratios like budget ratios, space ratios, staff ratios and so on, on the fact that one of the components of ratios is budget, space, staff, etc., respectively. It is not the intention of this paper to enumerate every possible ratio, but to highlight some selected internal ratios out of the domain of seven variables mentioned and illustrate them with the data from ISAC library.

At this juncture, it is worth reviewing some of the ratios already in vogue in librarianship in the form of standards. One of the widely used external ratios is to suggest a norm for providing budget to university libraries. While Radhakrishnan Commission (1948) has suggested 6.25% of university budget, Kothari Commission (1966) has suggested 6.5% of university budget as a standard[2]. The recommendation of Mr. Deshpande that 10% of the book budget should be for furniture and equipment and 5% of the book budget for binding in a college or university library are internal budget ratios.[3]

A collection to user ratio was involved when Mr. Goil recommended a provision of one copy of text book for every ten students as a standard.[4] The norm that a library should spend money on its staff salary and reading material in the ratio of 2:3 in its initial years and the ratio is reversed in later years as recommended by Kothari Commission (1966) and others is a clear budget ratio. Similarly, the per user (say student, research fellow, teacher) provision of budget is a manifestation of ratio between user and budget. Further recommendations like the reading room facility of a university library should house 10% of the total student population is a space to user ratio.

Though many standards have not been based on ratios, the experts have found it

reasonable to base some standards on ratios so that it can be related convincingly to one or more of other variables.

Before we examine the internal ratios of ISAC library, it must be noted that Randall[*] has identified six sets of ratios in line with financial ratios. He has called them ratios of acquisitions (annual additional) to collection, loans (use) to acquisitions, loans to collection, loans to borrowers (users), budget ratios and staff ratios. Based on data from several libraries of IBM he has not only tried to interpret and rationalise the ratios but also attempted to set some standards for industrial libraries of USA for comparing ratios of two libraries.

As found in case of standards, any attempt to compare ratios of dissimilar libraries and libraries of even different countries may become unrealistic.

Ratio Analysis of ISRO Satellite Centre Library

Some selected (sixteen) internal ratios based on seven variables discussed earlier are worked out for ISAC library. Table 2 presents the raw data on budget, space, staff, users, collection, annual addition and use/loans for five systematically selected random years ever since the library was started i.e. for the year, 1973, 1976, 1979, 1982, and 1985. There is a linear increase in all variables over years. However, the increase in collection is abnormally high as it includes volumes in microform which is acquired since 1979. The increase in space is very marginal. The annual addition to collection seems to have stablised after 1982. Using the raw data presented in Table 2, all the sixteen internal ratios for five sample years have been worked out and presented in Table 3,

TABLE 2 Growth of ISAC library budget, space, staff, users, collection, annual addition (*to* collection) and use/loans

Year	Budget* (Rs. in lakhs in F. Y.)	Space (in sq. ft.)	Staff	Users +	Collection	Annual addition	Use/loans (in 000's)
1973	1.20	800	1	200	1229	1017	NA
1976	3.40	800	3	316	3539	1211	NA
1979	9.52	2500	9	692	13306	6032	7
1982	22.C0	4000	11	982	54725	11972	23
1985	24.60	8000	19	1305	90345	11130	31

Key : NAm Not available; *. Budget excludes staff salary, office stationery, fixture, lighting and other utilities, import duties, etc; +, Users are those who have registered themselves as members.

Note : The collection respectively consists of O. O, 1898, 31962 and 55512 volumes in microform as of 1973, 1976, 1979, 1982 and 1985.

As could be seen from the table, the data for the year 1973 represents the initial years of library and the data of 1976, 1979 and 1982 represents a steep growth period and 1985 represents a tendency to saturated period. Secondly, wherever collection is used as one of the variables, the higher proportion of microforms in the collection has abnormally affected the ratios. Probably, the ratios based on individual type of documents like books, reports and microforms may indicate a different picture. Further microforms are scarcely used within the library and negligibly circulated outside the library. Further. almost no weeding out from the collection has been done so far.

Budget Ratios

In case of budget ratios, it is necessary to keep in mind a minimum inflation rate of about 10% and a considerable change in foreign exchange rates. Inspite of inflation and steep increase in price of reading materials the average price of a volume added has almost remained less than Rs. 300/- mainly due to high increase in acquisition of microform, a trend consciously planned and brought in. Budget per user as well as per staff has slowly increased over years and reached a maximum in 1982 and came down in 1985 (i.e. in saturated period).

Space Ratios

The variables space and staff strength of the library change in specific stages rather than continuously like collection or budget. Though space is loosely related to staff strength, one can see that about 250 to 400 square feet of space per staff was maintained except in the initial year.' The ratio of space to user is a quite stable ratio ranged from 2.5 to 6 sq. ft per user. The space per volume in the collection is a more meaningful space ratio. Incidentally, this ratio has linearly decreased though the addition of space is mearge, addition of volumes over years is very large and almost no weeding out has been done again mainly due to microforms in the collection.

Staff Ratios

How staff strength of the library is related to budget and space of the library has already been seen. How staff strength makes ratios with collection, annual addition to collection and use/loans are discussed in the respective groups below.

User Ratios

The number of user per library staff has shown some indication for setting standards. Except for the first year the library had one staff for every 69 to 105 users. Other user ratios are discussed below.

Collection Ratios

The two collection ratios in Table 3 indicate that the number of volumes per staff as well as per user have considerably increased over years (of course, including huge microform collection) indicating a rapid growth of collection compared to staff and user strength.

Annual Addition Ratios

While the number of volumes added per staff member has varied from 404 to 1088 (except initial year) the same stabilised around 600 during 1985. The same trend can be seen in case of number of volumes added per user. Leaving the initial year which naturally has a very high ratio of annual addition to collection, the rest of the years, the trend is that as the collection grows, the ratio decreases linearly and in a saturated period after 13 years it has become just 12%. It is interesting that Randall[6] has suggested this ratio to be between 6% and 10% for a 10 to 15 years old industrial library concerned with literature covering a changing technology. It is much higher in case of ISAC library which deals with space technology literature and hence suggests very high currency of the collection, despite lack of regular weeding of old items. However the ratio of number of loans per volume added is on much lower side in ISAC library mainly due to largely unused microform collection which forms more than double the paper copy collection in recent years. Randall[7] suggests that for an adequate acquisition program the number of loans in a year should be 3 to 7 times the number of volumes added in a year. In ISAC library, number of loans is slightly less than three times the annual addition for 1985. As a result intake of microforms is subjected to very keen scrutiny to reduce intake in future.

Use Loan Ratios

Both number of loans per staff and number of loans per user have well stabilised in recent years at over 1600 and 23 respectively indicating a high use. But the number of loans per volume in the collection is again on lower side due to abnormally large microform collection which is negligibly borrowed as well as lack of systematic weeding of obsolete volumes. Randall[8] suggested that the number of loans in a year should range between 30% to 40% of the number of volumes in the collection. Inspite of negligibly borrowed microforms forming nearly two third of the collection, ISAC library meets this requirement in the years 1979, 1982, abd 1985 with ratios 0.53, 0.42 and 0.34 respectively. However, as microform collection has grown rapidly, this ratio has decreased correspondingly from 53% to 34% over years.

TABLE 3

Budget, Space, Staff, User, Collection, Annual Addition and Use/Loan Ratios of ISAC Library

	Budget Ratios (Rs. in Thousand)			Space Ratios (in sq. ft.)			User Ratio	Collection Ratios		Annual Addition Ratios			Use / Loan Ratios			
	Budget per staff	Budget per user	Budget per volume added	Space per staff	Space per user	Space per volume	No. of users per staff	No. of volumes per staff	No. of volumes per user	No. of volumes added per staff	No. of volums added per user	Annual addition to collection ratio	No. of loans per volume added	No. of loans per staff	No. of loans per user	No. of loans per volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1973	120	0.60	0.12	800	4	0.65	200	1229	6	1017	5.1	0.83	NA	NA	NA	NA
1976	133	1.08	0.28	267	2.5	0.23	105	1180	11	404	3.8	0.34	NA	NA	NA	NA
1979	106	1.38	0.15	278	3.6	0.19	77	1478	19	670	8.7	0.45	1.16	778	10.12	0.53
1982	200	2.24	0.18	3?4	4.1	0.07	89	4975	56	1088	12.2	0.22	1.92	2091	23.42	0.42
1985	129	1.89	0.22	421	6.1	0.09	69	4755	69	586	8.5	0.12	2.79	1632	23.75	0.34

Key ; NA, Not available.

NOTE : The groups such as user ratios, collection ratios, etc,, are not mutually exclusive.

The grouping is just based on convenience. Hence, staff ratios are spread over other groups.

Conclusion

The interpretation of above ratios would have been more effective if standards for special libraries in India in terms of ratios were available for comparison. On the other hand, if more use of ratios are promoted eventually it helps to compare libraries and even set standards.

Uniform procedure to maintain library statisics with common understanding of definition of basic units and data recording systems would go a long way in promoting use of RAT in libraries and setting performance standards. Being too simple a tool, RAT needs to be applied in libraries with extreme care, intuitive judgement and skill. Inspite of its limitations RAT is a useful tool for assessing quantitative aspects of libraries.

Acknowledgement

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