Part I: Assessing Big Deals

Is your current Big Deal a good one?

Big Deal price = core journal price + additional journal price

This may be difficult to separate if the Big Deal is a single line item. If the core journals are not itemized, then they are the journals to which you subscribed pre-Big Deal.

I calculated the average and median cost per use (CPU) of journals from various publishers.

At the time, Villanova had long-standing Big Deals with Elsevier and Springer. I calculated the CPUs and compared to the individual subscription CPUs.

Core CPU = core cost / core use
Additional CPU = additional cost / additional use
Big Deal CPU = (core cost + additional cost) / (core use + additional use)

If Big Deal CPU is less than Core CPU, then the Big Deal is a good deal.
Whether or not you have the money is a separate question.

Publisher	Average CPU	Median CPU
Elsevier		
Core journals	$51	$27
Big Deal (including core)	$29	$6
Springer		
Core journals	$41	$33
Big Deal (including core)	$10	$0 (no cost)
Wiley (after cancellations)	$63	$36
Sage	$87	$28
Cambridge	$93	$33
Oxford	$65	$19
IEEE	$22(total cost / total use)	
Taylor & Francis	$280	$82

If you ignore the additional journals, the average CPUs for the core Elsevier and Springer subscriptions are lower than all publishers other than IEEE. Median CPUs are comparable to all publishers. Big Deal CPUs are significantly lower than other publishers.

- At Villanova, the Big Deals from Elsevier and Springer are better values than the individual subscriptions from other publishers.

- At Villanova, the value of the individual subscriptions from Taylor & Francis is the far bigger problem.

Should you agree to a new Big Deal?

First, assess your current subscriptions. These will be considered the core of the Big Deal.

High median CPU indicates that the core has low value. A Big Deal is likely to be a bad deal.

High average CPU paired with low median CPU indicates that low value journals are polluting a high value core. The low value journals should be cancelled. A Big Deal that contains the low value journals is likely to be a bad deal, but a Big Deal that does not contain them is likely to be a good deal.

Prior to the above analysis, Villanova had been offered a Big Deal from Wiley. We rejected the deal for a variety of reasons, including the presence of a significant number of journals polluting the core. The remaining journals are a little high, but comparable to other publishers. We are not currently negotiating with Wiley, but hope to do so in the future.

At the time of the analysis, Villanova was considering a Big Deal from Taylor & Francis. Clearly, this would have been a bad deal. We have cancelled most of the low value journals and hope to negotiate a Big Deal with a reduced core.

How to do the analysis

You can calculate the CPU for each core journal, but you will not be able to do this for the additional journals. Instead, use total cost and total use.

Step 1: Get year-end COUNTER report JR1: Number of Successful Full-Text Article Requests for as many years as possible. I believe that this is the best single measure of use.

Optional: Standardize names. For example, some journal names start with "The." I move "The" to the end of the title and change the color to red: Counseling Psychologist The.

Step 2: Combine spreadsheets. You need the journal name and YTD total. For some big deals, you need publisher and platform.

Step 3: Separate the core journals from the additional journals. If you do not have this information, you should be able to get it from the publisher. You may need to go back to the last invoice before the Big Deal.

Step 4: Add the prices you paid for the core journals for as many years as possible. If you do not have an itemized bill, use the list prices.

Optional: Add department budget codes. This will enable you to assess department allocations but is irrelevant to the Big Deal assessment.

Step 5: Calculate CPU over time. I have done this different ways depending on the data that was available to me at the time. I think you need a minimum of 3 years of use (which you should average) and 1 price. **Ideally, I would calculate annual CPU for every year and average the last 5 CPUs.**

Step 6: Calculate total, average, and median CPU. This can be compared to CPUs for other publishers.

Step 7: Calculate the total CPU for the additional journals. This is almost certainly a **single line item** that may or may not be combined with the core journals. Subtract the core journal price if necessary.

Step 8: If possible, maximize the value of the core by swapping the best additional journals for the worst core journals. There are multiple ways to do this. The easiest is to look for the additional journals that have significantly higher use than the core journals. You can use list prices to calculate CPUs that are comparable to the CPUs of the core. I use a combination of CPU, total use, and subjective judgment to determine the "best" journals. **Regardless of how you define "best," those journals should be in your core.**

Step 9: If necessary, repeat 6 and 7.

Part II: Assessing Journals and Budget Allocations

Science vs. Quantitative Procedure

The most important articles on budget formulas:

Gary M. Shirk, "Allocation formulas for budgeting library materials: science or procedure?", Collection Management Vol. 6 Iss: 3-4 pp. 37-47. 10.1300/J105v06n03_05

The author argues that a book allocation formula must be scientific, i.e., theoretically and empirically sound, to be a viable, long-term budgeting technique for collection development. The paper explains why, despite their appearance, most published formulas are not scientific, but, rather, merely notationally simplified expressions of arbitrary procedures. The author develops and applies criteria that distinguish between scientific and procedural formulas in published works. The paper concludes that, **if currently available formulas are successful, they owe their success to political acceptance, not to a defensible theoretical framework.**

Roger L. Cross, (2011),"Budget allocation formulas: magic or illusion?", The Bottom Line: Managing Library Finances, Vol. 24 Iss: 1 pp. 63 – 67. http://dx.doi.org/10.1108/08880451111142114

Budget allocation formulas claim objectivity, and hence fairness. But factors composing the formula are limited to supply, demand, and cost. Attempts to correct for this imbalance of empirical data like usage have led to the use of weighted values in the formulas. This paper seeks to argue that **assigning "weight" in a formula introduces value judgments and subjectivity, leaving only the misplaced illusion of objectivity.**

Eric FuLong Wu, Katherine M. Shelfer, Materials budget allocation: A formula fitness review, Library Collections, Acquisitions, and Technical Services, Volume 31, Issues 3–4, 2007, Pages 171-183. 10.1016/j.lcats.2008.03.001

Based on our findings, we believe that the semantic attributes of the variables we use in our formulas need to be better understood, since our calculation outcomes rely on them. For this reason, we believe that variable diagnostics are important, because variables themselves are seldom justified, however, they are commonly reported. **Our work indicates that the use of evidence-based insight is lacking**. FTE in particular is widely used, but we found no evidence to actually support this practice. There is a body of information science literature that discusses these concerns, but we believe there is urgent need for empirical research that will generate evidence to support the variables used in our calculations. We also believe that practitioners should not ignore advances in information science that could improve library practices.

Can we quantitatively assess the value of a journal?

Yes. I believe that there are 3 components to an accurate assessment.

1. Cost Per Use: I believe this is the best single measure of value.

2. Total Use: I believe this is the second best single measure of value.

3. Importance: This is incredibly difficult to accurately measure. Impact factors, eigenvalues, and similar quantitative measures attempt to do this.

The University of California beat me to it.

http://www.cdlib.org/cdlinfo/2012/02/13/calculating-scholarly-journal-value-through-objective-metrics/

I like their language better than mine, so I'm adopting it.

1. **Cost Effectiveness** I measure this with cost per use, but there are other measures.

2. **Utility** I measure this with total # of full text article requests (COUNTER compliant when possible).

3. **Quality** I use, or will use, both quantitative and qualitative measurements.

In mathematical form (for non-mathematicians)

y=f(x) means that y is a function of x
In other words, y is determined by an equation that contains x.
For example, y= x+2.

f(x) can be used when you don't know the formula,
but you do know that it contains x.

$$V_{(j)} = f(c,u,q)$$

$V_{(j)}$ = value of a journal = a function of c, u, and q

c = cost effectiveness u = utility q = quality

What is f(c,u,q)?

Is it c+u+q? Is it 2c+u*q? Is it (c+3)*(u+q)?

We don't know. We may never know.
Further research is needed to answer this question.

How can we determine f(c,u,q)?

We can make up formulas, but these formulas are quantitative administrative procedures. We may be like them, but we won't know that they accurately measure value. Instead, as Shirk points out, we need to create a "defensible theoretical framework" that can be empirically tested.

What Can We Learn from the Ideal Gas Law?

A simple formula may not be perfect, but it might be good enough.

$$PV = nRT$$

Pressure * Volume = constant * constant* Temperature

Ideal gases are not real, but the ideal gas law does a good job of predicting real experimental values.

The Van Der Waals Equation is significantly more complex.

$$\left(p + \frac{n^2 a}{V^2}\right)(V - nb) = nRT$$

In some situations, it does a better job of predicting real values. In other situations, it doesn't.

Instead of trying to identify every factor that contributes to the value of a journal and completely understand how they relate to each other, I'm attempting to find major factors with simple relationships that can be easily tested.

The Three Components of f(c,u,q)

We do not know the relationships between c, u, and q. Figuring out the exact relationships is a difficult problem to solve. However, if we look at each individual component, we should have simpler equations that are easier to test.

Can we define f(u) with a single measure?

How do we easily measure utility?

# of full text article requests? # of times cited by your faculty?
# of times cited in student papers? Some combination of these?

I use "utility" to refer to the broader concept that combines various measures.

I use "use" to refer to the f(u) when determined by a single measurement. specific measure that I'm using.

f(u) = # of full text article requests = use
COUNTER compliant where possible

Can we define f(c) with a single measure?

How do we easily measure cost effectiveness?

cost per use? cost per article? cost per issue? cost per citation?
Some combination of the these?

f(c) = cost per use = CPU

CPU contains Use

f(c) = c / f(u)

Can we define f(q) with a single measure?

How do we easily measure quality?

Not at this time.

Quantitative measures such as impact factors , eigenfactors, and SNIP are useful but appear flawed.

The best measure that I have found is a qualitative one: the ERA Journal List produced by the Australian Research Council. Journals were assigned letter grades. http://www.arc.gov.au/era/era_2012/era_journal_list.htm

I believe that quality is best measured at the local level. A high quality but highly specialized journal does not need to be in the collection of a library that does not support that specialty. Similarly, a journal that is low quality by broad standards may be considered high quality by a more specialized audience.

I intend to ask faculty to rank journals as "essential," "important," or "optional." I intend to do this for actual subscriptions and for JCR categories. I can then calculate %s by department to assess the strength of the collecitons.

Do we need f(q) in order to determine f(c,u,q)?

I do not believe that we do. Consider the following scenarios.

If CPU is low and U is high, we can infer that the journal is high quality.

If CPU is low and U is low, then C must be low; we can infer that the journal is low quality.

If CPU is high and U is high, we can infer that the journal is high quality but overpriced.

If CPU is high and U is low, we can infer that the journal is either low quality or overpriced. But in both cases, the value of the journal is low.

My first hypothesis is that there is a weak positive correlation between quality and value (as measured by CPU).

Can we approximate $V_{(j)}$ without an exact formula for f(c,u,q)?

I believe we can.

We don't need to know an exact numeric value for each journal. We need to know whether or not we should subscribe and whether or not we need to negotiate a better price.

My second hypothesis is that we can broadly measure value by measuring CPU alone. If we need to make fine distinctions between similar CPUs, then we need to consider Use.

In mathematical terms, $V_{(j)} = f(c,u,q) = f(c) = CPU$.

More complex functions are not necessarily more accurate. If more complex functions are not well understood, they are arguably less accurate because they are administrative procedures, not scientific formulas

Future Research to test these hypotheses

I hope to do the following.

- Measure the correlation between the local faculty assessment and CPU.
- Measure the correlation between the local faculty assessment and any of the other metrics of quality.
- Depending on the results of the above, I may attempt to measure the correlation between CPU and the other metrics of quality.
- Possibly measure the correlation between CPU and Use.

ΔCPU: A Revolutionary Approach to Assessing Budget Allocations

CPU = cost per use

ΔCPU = CPU (year 2) – CPU (year 1)

For journals, I use the # of full text downloads as defined by COUNTER when possible.

Circulation can be used to calculate CPU for books.

Negative ΔCPU means that CPU went down. The value of $ spent went up.
Either use went up, costs went down, or some combination of these.

Positive ΔCPU means that CPU went up. The value of $ spent went down.
Either use went down, costs went up, or some combination of these.

My hypothesis is that ΔCPU accurately assesses budget allocations and can be used as a tool to rebalance.

ΔCPU

Dept. A: +$5

Dept. B: -$2

Dept. C: -$4

Dept. D: +$1

In this example, the big budgets became larger while the small budgets became smaller.

If all you see are the pie charts, then you might think that the big departments are overfunded. But the big budgets are getting more for their money than the small budgets are.

Using ΔCPU rather than CPU factors out differences among various subject areas.

What is a good value for CPU? $50 might be a good number in one field but a bad number in another. CPU can vary among fields just like cost per living varies among zip codes. Using ΔCPU corrects for this.

Rebalancing using ΔCPU is self-correcting

For example, let's say Dept. B's ΔCPU went down because use went up. Costs were constant. According to my theory, Dept. B should get more money to meet the demand indicated by the increased use. If that money was really needed, then ΔCPU will keep going down. But at some point, the needs will be met. If costs increase but use doesn't, then ΔCPU will go up. In this scenario, the budget will go down.

Testing the Hypothesis

I intend to simulate a budget reallocation using existing journal data. I manage 9 fund codes, so I can rebalance just my funds or the overall budget. First, I intend to see what journals I would cancel and compare to my faculty assessment. The results of this will determine what I do next.

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