

General Information (January 15, 2007)

Question: Does the University Research Council still exist and function?

No. The provost's office eliminated the University Research Council (URC) in 1999. The URC was replaced in University Central by two companion programs, the Discovery Grants Program and the Research Scholar Grants (RSG) Program. The Discovery Grants Program provides seed-funding for research in order to enable faculty to compete more effectively for external funding from the various granting agencies. The RSG Program provides research support for faculty conducting research in areas in which the opportunities for extramural funding are limited. There is, in addition, a Discovery Grant Program in the Vanderbilt University Medical Center. The two Discovery Grant Programs operate independently, but the two programs co-fund research projects from time to time.

Question: How does one gain access to funding provided by the Research Scholar Grant and Discovery Grant programs?

Tenured and tenure-track faculty in University Central (and faculty holding equivalent ranks in the Blair School of Music) are eligible to apply for support under these two programs. Both programs emphasize the awarding of funds on a competitive basis. That is, within each of the two programs, there is a single call for proposals that is announced annually, usually early in the fall semester; the majority of the funding available each year in each program is awarded as part of that program's annual competition. Faculty are encouraged to read carefully the description of each program to become familiar with these internal-funding opportunities. Current program information and application deadlines can be found at the following website for the Division of Sponsored Research:

<http://www.vanderbilt.edu/dsr/intramural.php>.

Awards in both programs are usually announced in early April.

Question: Does Vanderbilt provide assistance with the publication of faculty-authored books (i.e., subventions)?

It is important for Vanderbilt faculty to publish their work. In cases where special circumstances make it necessary for faculty to seek publication-assistance funds, faculty are encouraged to do so through their deans and through the Research Scholar Grants Program. The Faculty Development Grant category of the Research Scholar Grant Program invites, among other things, "requests for financial assistance with the publication of an important book."

Question: How successful has the University been in attracting external funding?

The University has experienced unprecedented growth in extramural funding, something that has been recognized in a number of rankings. For instance, Vanderbilt's rank on the

government's list of (all-agency) Federal Obligations (i.e., grant/contract awards) for Science and Engineering Research & Development has gone up steadily, as shown on the list below. Note that this ranking has a built-in two-year lag. That, for instance, the list released in 2006, on which Vanderbilt ranked #23, is based on the data for 2004.

Year	Rank	Based on	Year	Rank	Based on
2001	#39	FY1999	2004	#25	FY2002
2002	#38	FY2000	2005	#24	FY2003
2003	#31	FY2001	2006	#23	FY2004

Total external awards made to Vanderbilt during FY2006 exceeded \$450 million. In the Provost's domain, excluding the Medical Center, external funding for research doubled between 2000 and 2005, for an average annual increase of approximately 14%.

Question: What are the indirect-cost revenues that come to the University associated with research grants and contracts, and what happens to them? (Note: "indirect costs" are sometimes referred to as "Facilities and Administrative" costs, or simply as "F&A costs.")

The federal government recognizes that certain costs associated with carrying out research are difficult to assign to individual grants or contracts because the services they're connected with serve hundreds of funded programs. Such costs are better treated as common costs or pooled costs. A good, illustrative example is offered by Vanderbilt's two sponsored-research offices, one in University Central and the other in the Medical Center. Those offices serve the needs of every faculty member or other investigator requesting or receiving external funding. The offices would not exist at all if Vanderbilt did not receive external funding – they exist entirely to process and negotiate grants and contracts according to federal guidelines for doing so. Instead of trying to figure out what small fraction of such pooled-cost expenditures to charge to a specific grant or contract, the government negotiates with every university a pooled-cost reimbursement rate called the indirect-cost rate.

With few exceptions (a complicated story), that negotiated rate is applied to every grant and contract to determine the extra funds that will be awarded for the pooled costs. For instance, if a faculty member seeks \$100,000 to cover approved expenses (i.e., direct costs) for research at a time when the approved indirect-cost rate is 52%, then the proposal sent to the funding agency will ask for \$152,000. If awarded, then \$100,000 will go to the faculty investigator and \$52,000 will go to the institution to help defray the common, pooled costs. It's worth noting that, in that example, the \$52,000 is not intended to pay for the pooled costs associated with that particular grant. The government understands that different kinds of research rely differently on the shared support structure. The 52% figure is chosen so that, when applied as above to all grants, the intended total number of dollars will be sent to the institution for approved indirect costs. The 52% figure takes on meaning only at the institutional level.

The government agrees to reimburse universities for an appropriate share of a defined set of approved indirect costs incurred for such things as administrative services (recall the sponsored-research-office example), building depreciation, equipment depreciation, interest on building loans, operation and maintenance, and library costs, things that clearly support federally sponsored research. Every few years, the university

enters into negotiation with the government to determine a new indirect-cost rate. There is a prescribed approach for doing this based on the institution's *actual* expenditures for the approved set of categories in a specified recent year. Once upon a time, if the negotiation showed that the university could justify, to the government's satisfaction, say, a 62% indirect-cost rate, then the government would approve that 62% cost rate. In modern times, to the chagrin of universities, the government deliberately approves a lower indirect-cost rate. Even though Vanderbilt can justify an indirect-cost rate of around 60-62% based on actual research-related expenses in the approved categories, the government nevertheless approves a rate of 53% (for 2006-2007). Indirect cost revenues are best described as an under-reimbursement of actual expenses. Those revenues have to be supplemented from other sources in order to cover the university's actual expenses connected with research.

Question: Where can one find information about the initiatives seeded by the Academic Venture Capital Fund?

A list of the eleven initiatives seeded under the AVCF Program, and the points of contact for each initiative, can be found at the web address given in the response to the previous question.

Question: What is the relationship between the annual growth rate R and the doubling time T ? That is, if a quantity N is increasing at the annual rate R (so many percent per year), how long will it take to double N ? (Example: a 14% annual growth rate leads to a doubling in 5 years.)

The answer is $T = \frac{69.3}{R}$.

Question: Why is the above true?

This is an exercise in understanding the implications of *exponential growth*. First, why is this exponential growth? Another way of saying that N increases by so many percent per year is to say that as time passes, the increase in N , call it dN , is directly proportional to N . Mathematically, we say, with a little calculus, that

$$\frac{dN}{dt} = P \cdot N, \quad (1)$$

where P is the rate of increase (so much per unit time, not yet expressed in percent) and t is the time. Equation (1) is a differential equation with the well-known solution

$$N = N_0 \cdot e^{Pt}, \quad (2)$$

where N_0 is the value of N at the moment when we set our stopwatch to $t = 0$ to begin marking time. Equation (2) is the definition of exponential growth, with e being the basis of the system of natural logarithms ($e \sim 2.7183$). We're interested in the time it takes for N to double from starting value N_0 to $2N_0$. Let's define the doubling time T to be the time on

our stopwatch when N reaches the value $2N_0$. Said simply, at time $t = T$, we'll have $N = 2N_0$. Plugging this into Equation (2) gives

$$2N_0 = N_0 \cdot e^{PT} \quad \text{or} \quad 2 = e^{PT}. \quad (3)$$

After taking the natural logarithm of both sides of the right-hand equation in Equation (3), we find that

$$\ln(2) = P \cdot T \quad \text{or} \quad T = \frac{\ln(2)}{P}. \quad (4)$$

The right-hand equation is the basic result we're after, but we can put it into rule-of-thumb form. Multiplying numerator and denominator by 100 lets us express P in percent (i.e., $R = 100P$):

$$T = \frac{100 \cdot \ln(2)}{100 \cdot P} = \frac{100 \cdot (0.693)}{R} = \frac{69.3}{R}. \quad (5)$$

The last of the above is our final result. With T the doubling time in years, and R the percentage rate of increase per year (i.e., so many percent per year), we find that R and T are related by the simple equation

$$\boxed{T = \frac{69.3}{R}}. \quad (6)$$