POSTERMINARIES

A Certain Uncertainty Principle

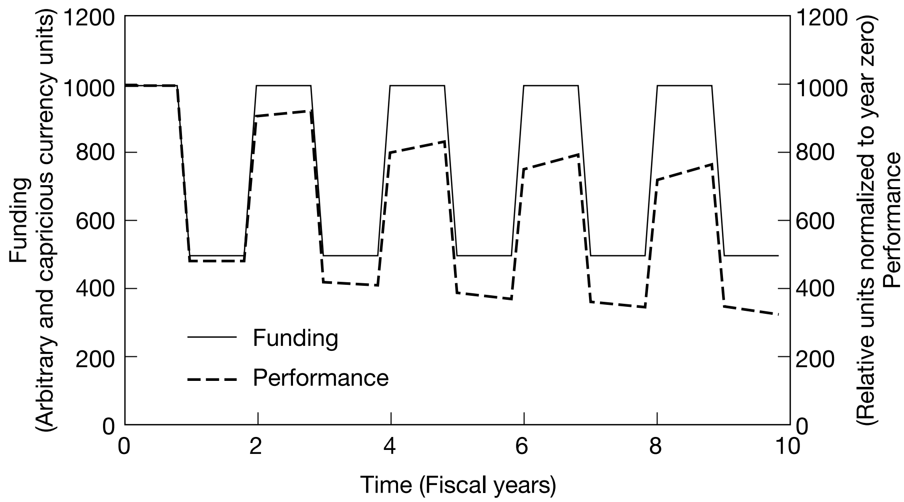

Figure. Effect of funding fluctuations.

What would you do if the amount of your paycheck fluctuated unpredictably while your job assignment and expectations remained essentially the same? Would your banker be happy to let your monthly mortgage payment fluctuate in a commensurately unpredictable way while freezing the dollar amount of interest paid? Would you be more or less likely to enter into long-term commitments of capital and other illiquid resources based on unreliable predictions of future income?

I guess the point is more than made, especially for us salaried folks. But what of an entrepreneurial enterprise or an independent contractor? Surely these people have learned to manage an uncertain revenue stream. Perhaps they have a nest egg to fall back on during slow periods, essentially ballast to weather the storms. Or, perhaps they have a large fraction of expense outsourced which they can pull back quickly when circling the wagons. Alas, a third alternative is that they file for Chapter 11 protection and then go belly-up. You say, "Such is capitalism and such is life"? Indeed so.

Now, geopolitically astute readers will cite alternative social systems intended to smooth the economic bumps. The safety nets of public assistance to the indigent and universal access to quasi-free healthcare are two of the more altruistic algorithms. Guaranteed cradle-to-grave jobs and retirement benefits go further toward avoiding the messy uncertainty of the more free-for-all alternatives. Lest we begin to ramble like a century-old manifesto, let us come straight to the point. The point is inefficiency. Unavoidable inefficiency inextricably embedded in all schemes designed to buffer dislocations. It is fair to say that this is just the cost of doing business and like any cost should be passed on to the customer. This is all well and good, unless of course you happen to be your own customer! How can that be?

If you both pay taxes and perform government-funded research, you are in effect your own customer. If this were directly so, surely you would not jerk yourself around with all the attendant psychological stress and economic doubt. The problem is, of course, that it is not directly so. There is, to borrow a term from the Internet culture, disintermediation going on. In the United States once per year, the funding agencies, the Office of Management and Budget, and by implication the President decide how much money to ask for on your behalf. If you think this amount is tied solely to your level of effort and future needs, you need a large dose of reality. Whether it is political or overall budget considerations that intervene, there are always bigger fish to fry than yours. Then the legislative branch duly changes all the numbers for a similar set of often arbitrary and capricious reasons that are largely unrelated to you. At least at this stage you had better hope that they are unrelated to you, for those who are anointed with "line-item" status become visible enough to be pawns in their own right.

It is not over yet. Unless you are an earmark, a pariah generally despised among scientific colleagues who believe in peer review, you are now subject to the post-appropriation vagaries of your funding agency's and program manager's allocation algorithms. The end result is that you, through your elected representatives and their appointees, have guaranteed yourself a fluctuating and unpredictable annual income. The figure schematically illustrates the effect on the work you produce of a periodic opening and closing of the spigot. An analogous non-periodic inefficiency arises from so-called timeline stretch-outs, a penny-wise, pound-foolish variation on the theme. Expertise lost during the cut cannot be built up quickly enough after the restoration. The dollars you do have do not stretch as far when lease-to-buy financing eats into your principal. And just as you see light at the end of the tunnel, a new fiscal year foils your best-laid recovery plan, making recruiting new talent into a soft-money situation ever more difficult, and a slow downward spiral ensues.

You will not soon get level-of-effort, multiyear block funding to reverse this self-defeating trend, but be assured that you will get your share of criticism for not having met original performance goals. It takes no quantum theorist to understand the certain consequences of uncertain support.

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