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Chapter Authors: Paul A. David

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The Innovation Fetish among the *Economoi*
Introduction to the Panel on Innovation Incentives, Institutions, and Economic Growth

Paul A. David

My instructions from the organizers came with two messages: be brief and be provocative. Brief, I have heard about before. But I had to think about being provocative, because the message was opaque on the question of who it was that I was meant to provoke. In the end I decided to attempt a mass provocation.

How better to do that than introduce this panel discussion by assaulting what I take to be the very premise of the session—namely, that we all are agreed that our purpose here, and more generally, is to seek more innovation by designing stronger, more effective incentives and more appropriately supportive institutions. Rather than nod, I wish to demur and declare that I view that casual supposition as another manifestation of a widespread and rather deplorable contemporary obsession: "the innovation fetish."

Without going too deeply into ethnographic detail, much evidence has accumulated that this particular phenomenon recently has become ubiquitous among the *economoi,* that loose federation of tribal groups populating and continually extending their domain of influence within the social sciences. The innovation fetish grips its adherents—and particularly those among the *economoi* who avow special concerns with technological change and its impact upon economic growth and human welfare—with an unreasonable degree of attention to, and particular reverence for acts of commercial implementation of new processes and products, organizational practices, and business models.

Paul A. David is professor of economics emeritus at Stanford University, a senior fellow of the Stanford Institute for Economic Policy Research, a professorial fellow of the United Nations University-Maastricht Economic and Social Research Institute on Innovation and Technology, and a research associate of the Program on Innovation and Regulation in the Digital Economy at Telecom-ParisTech and l'École Polytechnique, Paris.

Worse still, the contemporary preoccupation with and excessive fixation upon innovation has spread beyond the *economoi* to national political leaders, the heads of private and public foundations that disperse funding for scholarly and proactive purposes, administrators of institutions of higher education and research, and ambitious high-school students. Possibly their behavior is only mimetic of the ecstatic obsessive practices they have witnessed on the part of the *economoi.* For the latter's engagement with innovation has taken on increasingly reverential overtones to the point that the revered object is endowed with seemingly magical or spiritual powers associated with animistic or shamanistic rituals—as in the practice of offering public policy advice that ritualistically summons up potent quasi-magical (certainly hard to measure) effects—notably in the forms of "knowledge spill-overs" and "information externalities."

The obverse side of the growing absorption of the *economoi* with such practices is their comparative indifference, if not outright reluctance, to being distracted with inquiries into the structure of incentives and institutions that may be affecting other, surrounding and related processes that along with innovation were once held to be important determinants of "the rate and direction of technological change." Here, of course, I allude to the multitude of less mentionable specifics, starting with the identification of unexplained phenomena and unmet practical needs; then to scientific discovery and invention, the implementation of inventions by product and process design and development, including production engineering and reengineering driven by producer-user interactions; then to marketing, and, last but not least, to the subsequent diffusion of novel goods and practices into widespread use, from whence flow the economic welfare gains generated in the forms of greater productivity and consumer satisfactions from the new goods' and services' enhanced qualities.

To sharpen the point of this, my first provocation, I say: we should not make the analytical mistake of discussing "innovation policy" to the exclusion of everything else, or approaching questions of science policy, or education policy, or competition policy, or regulatory policy by first asking "what will it do for innovation?" True, it would simplify the analysis and its presentation for discussion if we isolate our thinking about the innovation process from all but its most proximate determinants, such as the workings of the patent system and the licensing of inventions on one hand, and the management of the introduction of new products and processes by business enterprises on the other, and thereby remove the subject from its systemic context. The resulting simplicity, however, is a recipe for mistakes in policy and the misdirection of resources.

Instead, a systemic approach would help identify the interdependence and feedback dynamics in the relationships among what too often are treated as separable stages in the logical sequence beginning with research and invention, passing through the portal of innovation, and ending with diffusion

and ubiquitous adoption. Here there are several counterintuitive observations to be considered. For example, an innovation's diffusion into more widespread use is likely to identify the need for adapting the design to accommodate unanticipated variations in conditions encountered in the field. Via that "back channel," diffusion itself can be a stimulus for further inventive activity and subsequent innovative adaptation. But, if diffusion is acknowledged to be a dynamic driver of R&D and innovations that broaden the capabilities of a novel product line, then one also should be prepared to recognize the prospect of faster innovation as a potential enemy of diffusion.

That apparent paradox is readily explained if one starts with the analysis of the determinants of the decision to adopt an innovation embodied in a durable producer-good. Viewed from that vantage point, a credible commitment of public policy to accelerating the rate of innovation in the particular class of technologies being considered for adoption is tantamount to promising the future arrival of new and superior vintages of the new capital equipment that currently is on the market. Because rational potential buyers are likely to be concerned to avoid the capital loss that the arrival of tomorrow's improved version is expected to bring some of them, at least they will defer today's acquisition of the novel equipment now available. The result of the pro-innovation policy commitment may well be the perverse slowing of adoptions, to the detriment of the innovating firm's profits and its ability to finance needed incremental technical improvements that would widen the market future vintages in its product line.

A single provocation of this kind may not be adequate to stir either the panelists or the audience. So, here is a second prod. It has become apparent that, gripped in the thrall of the innovation fetish, the *economoi* collectively have lost the ability to contemplate the possibility that enough may be enough; that a point could be reached where more innovation is worse. The near pathological impulse to push the rate of innovation to be ever-faster needs a medical psychiatric designation, and I propose to refer to it as the innovation fetish's "Imelda Marcos syndrome"—in memory of a famous instance of the uncontrollable, obsessive accumulation of more and more pairs of women's shoes (another richly documented fetish object).

The optimum rate of innovation for an economy, business entity, or social organization is a notion that rarely is discussed, except by implication, which has left it poorly defined. Yet, unless this concept somehow was implemented and thereby operationally defined, how could one claim to judge whether the pace of innovation currently prevailing in a given branch of industry or sector of the economy was too slow, rather than just right or too fast? By contrast, the optimal rate of Harrod-neutral technical change and hence the optimal steady-state rate of labor productivity growth is nicely defined, at least for certain familiar classes of growth models; and, in the literature on the economics of R&D the question whether we have too much or too little (R&D) input into the processes of research and inven-

tion is frequently asked and answered empirically. Why should not excessive innovation be acknowledged to be just as much a possibility as is excessive investment in scientific research, or in industrial R&D?

But, for all the attention and advice being offered to governments seeking to promote innovation as the key instrument responsible for economic growth, questions as to whether the prevailing rate of innovation was undesirably slow or excessively rapid barely can be posed, let alone answered. This state of affairs is not without consequences. Because one cannot say with confidence that it is or ever has been optimal, or too rapid, the judicious position for policy advisors to take regarding the innovation rate is to say in all candor that there simply are no grounds for not supposing that the pace of innovation is slower than its optimum rate. The argument from ignorance thus continues to leave full scope for policy recommendations that are justified on the ground that their effects will encourage innovation.

In confronting this, the root of the innovation fetishists' "Imelda Marcos syndrome," I shall confine myself to offering an evolutionary argument for supposing that if an optimal rate of innovation exists for any branch, industry, or economic sector, it cannot be continuously positive. Therefore its *average* rate over substantial finite durations in time must remain strictly bounded from above. This proposition in itself is not very useful as a guide for concrete policy recommendations, but, beyond serving my present provocative purposes, the "evolutionary" perspective from which I have reached it may be of some more general interest.

My argument proceeds from the observation in biogenetics that evolutionary processes that allow populations of organisms to adapt incrementally by "experimenting" with genotypic mutations—some of which have the potential to enhance aspects of the functionality (and hence inclusive fitness) in the organisms that carry them—cannot proceed continuously through time. This is to say that evolutionary dynamics in biology has to allow for finite "pauses" during which new functional traits acquire stability, in the sense of becoming "fixed" in the gene pool of the current population. By doing so, phenotypic "platforms" are created for further experiments, in which recessive mutant genes may express themselves and manage to replicate in the population, or not.

Most mutations and their associated traits, however, will give rise to nonviable "monsters" and be rapidly discarded, rather than becoming fixed in the gene pool. Analogously, it may be remarked that "inventions" in the domains of technological artifacts and financial instruments, and the innovations that seek to exploit their properties, also are most likely to result in dysfunctional monsters that are destined to be rejected as technically or commercially nonviable, or worse, actually destructive of larger systems into which they are introduced. Innovation in the technological and economic sphere is notorious as a highly dissipative process that will burn lots of

resources before it finds something that is new, better, and "ecologically" sustainable enough to yield a substantial stream of quasi-rents.

Furthermore, like genetic mutations, innovations may take a considerable length of time before manifesting their full systemic consequences, and the process of selection (whether by market forces or other social mechanisms) is likely to involve many learning errors. That is the case especially when the epigenetic landscape affecting adaptive selection itself is undergoing frequent and essentially exogenous alterations—as a consequence of experiments concurrently taking place in the other inhabitants of the same ecological ("market") niche. Some of those selection errors will not be quickly sloughed off, however, and instead may persist long enough to shape the ensuing course of technological and institutional developments in ways that impose significant cumulative economic costs upon later generations.

Therefore, if one seeks the useful outcomes of a highly dissipative process, and identification of utility itself is neither straightforward nor swift, it is not unreasonable to adopt a strategy of launching as many waves of concurrent "experiments" (innovations) as can be afforded. This line of thought proffers an attractively broad and cogent rationale for even more innovation. But it should be embraced cautiously. To the extent that it is possible to partition the experimental field so that the outcomes of each trial are substantially independent of what is going on in the next field, and, by analogy, to have an economy partitioned along business and industrial lines so that linkages among them are neither very dense nor very strong, there is a case to be made that the pace at which new things are being introduced within a given sector should be left uncontrolled. To put this in more concrete terms, there are some special circumstances in which the kinds of generative, innovation-inducing externalities (of the sort whose effects that have been lauded in the endogenous economic growth literature dealing with the "general purpose technologies") safely can be expected to yield overwhelmingly beneficial systemic outcomes.

Still, it is worth pausing here to delve a little more deeply into those qualifying conditions. If the processes of diffusion, adaptation, and modification are slow-moving and only one such major "disruptive innovation" is in play, and has initial impacts that remain largely localized within one or another among the economy's major sectors, then we have conditions in which the destructive and dislocating consequences the "creative destruction" left in the Schumpeterian innovator's wake are likely to be tolerable, in the sense of being manageable at the macro-system level. This is not to ignore or minimize the adverse redistributive effects of the economic obsolescence and vanishing profitability of long-established business firms, of the displacement of workers and the lost market value and social status associated with particular human skills, or of the diminished support for certain valued social institutions and public services that were dependent upon the local tax

revenues formerly generated by now destabilized and business agglomerations. Rather, it is to say simply that under certain favorable circumstances the economic damages need not assume unmanageable proportions; that such negative spill-over effects as the ramifications of creative destruction impart to other regions and agents that comprise the economy may well be offset by compensating gains in its newly emerging and rejuvenated lines of activity; and that even if no compensation can be arranged politically for the injured, at least the transition initiated by a narrowly directed burst of technological innovation in itself will not substantially degrade the performance of economy as a whole.

The situation is quite different, however, where the structure of interindustry linkages in the system renders it far from semidecomposable, or where major economic sectors are burdened by persisting structural problems, or have been seriously dislocated by foreign competition or aggregate demand shocks. One should hardly be so sanguine about policies that in *such conditions* undertake to promote disruptive innovations in order to invigorate sectors of the economy that were functionally stable, albeit technologically dormant. Unfortunately, qualifications of this sort appear sparsely if at all in the rhetoric of innovation policy that today calls for further measures to promote faster innovation, ceaselessly, and concurrently everywhere throughout the economy—taking this to be the obvious all-purpose remedy for the multiplicity of our economic difficulties.

I think I have now said enough, and perhaps more than enough to articulate the thought that there are phases in the life of economies, as in the lives of firms, where strategies of consolidation and reconfiguration of effective routines are likely to be more beneficial than those that seek to exploit opportunities for enhanced performance by "shaking up everything." If that is so, then the socially optimal rate of innovation cannot be continuously positive within industries or organizations, and it surely cannot be the maximum rate attainable. By the aggregation of diverse micro- and meso-level innovation processes whose phases are uncorrelated but similar in amplitude, a suitably diversified economy may enjoy the effects of a more or less steady average pace of innovation at the macro-level. The habit of abstracting from this more complex view of the issue in growth modeling exercises that work with single- or two-sector systems runs the risk of leading analysts and policymakers astray.

To free ourselves from the innovation fetish's grip might well lead to more thoughtful and discriminating policy advice about innovation and its role in economic growth, and it could usefully reinvigorate research on the determinants of the rate and direction of technological change. At the very least, it is likely to refresh discussions and debates among the *economoi,* hopefully on this occasion and continuing thereafter.