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## Transformational Incentives for Innovation and Aid Effectiveness: Pull Mechanisms, Contests, and Prizes

Economic transformation is possible. Step changes in growth can be triggered by new incentives that attract entrepreneurs, investors, and consumers to adopt successful innovations. Prize contests are a time-honored funding instrument used to spur change, focusing attention and resources on key constraints at the development frontier. The ancient Greeks and Romans sponsored contests to improve chariots and horsemanship. In the 18th and 19th centuries, contests inspired improvements in navigation and food storage, and in the 20th century, they promoted commercial aviation. Today, we have the measurement methods and communications technology to design increasingly effective contests for a wider range of objectives.

Contests and prizes can accelerate development in part by pulling resources toward results, as opposed to pushing inputs. Recent examples

include the Advance Market Commitment<sup>1</sup> for vaccine purchase and the Cash-on-Delivery<sup>2</sup> aid for schools advocated by the Center for Global Development. Contests can also facilitate open innovation, attracting ideas from visionaries in society at large, as opposed to stovepipe R&D programs within a single organization. The power of pull mechanisms and open innovation to transform economic life was dramatized in 2004 by the Ansari X PRIZE for the first civilian space flight, whose \$10 million award attracted many times that investment to scale up the prize-winning technology. Since then, prize contests have been

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1 Ruth Levine, Michael Kremer, and Alice Albright, *Making Markets for Vaccines: Ideas to Action* (Washington, D.C.: Center for Global Development, 2005).

2 Nancy Birdsall and William Savedoff, *Cash on Delivery: A New Approach to Foreign Aid* (Washington, D.C.: Center for Global Development, 2011).

*This essay builds on research originally conducted in 2007–2008 as part of the author’s USAID-funded Linkage project with the International Food Policy Research Institute, summarized at <http://sites.tufts.edu/willmasters/research/prizes>.*





**Pakistani technicians install a wind turbine on the subtropical island of Kharochhan, couched in the cyclone belt of the Arabian Sea. This tiny island is light years ahead of the country, powering homes and businesses with wind turbines, saving the ecosystem and improving residents' quality of life.** | AFP Photo: Rizwan Tabassum

increasingly used by governments, philanthropies, and private firms, including Innocentive.com, NineSigma.com, and Hypios.com.

The U.S. government's use of contests was spurred by President Obama's September 2009 *Strategy for American Innovation*, then endorsed by the Congress in December 2010 through passage of the America COMPETES Reauthorization Act. As of March 2012, the official Challenge.gov clearinghouse hosted 163 competitions sponsored by 41 departments and agencies, including 2 contests developed by USAID. Other international development agencies are actively seeking new contest designs, with the World Bank's Agricultural Pull Mechanism Initiative, launched in late 2011, as one of several pioneering initiatives.

## **The Transformational Power of Proportional Incentives**

In well-designed contests, one dollar in prize money attracts many dollars' worth of effort toward the desired results. This economic leverage is not magic: It rests on the information provided by the contest about which innovations work best, for whom, under particular conditions. Contestants typically put more effort into the contest than they can win in prizes because the competition results are themselves valuable, revealing hidden information about relative performance for potential investors and adopters to scale up prize-winning approaches.

Contests designed to spur agricultural development were recently reviewed by the Center for Global Development in a report that contrasts

traditional lump-sum prizes with new contests that would offer proportional rewards.<sup>3</sup> A proportional-prize contest is designed to mimic private-sector competition for market share. This type of contest offers market-like incentives by specifying a way to measure success, and a sum to be divided among contestants in proportion to their share of measured achievement. With proportional rewards, every contestant is paid according to their relative success (unlike traditional contests), while the funder specifies when and how much their total payment will be (unlike Advance Market Commitments or Cash-on-Delivery aid). The approach requires only that achievements be measured by some common yardstick. The unit of measurement can vary, allowing contest sponsors to create a market for the achievement of any measurable goal.

Real-life markets often involve the accumulation of achievements, each paid in proportion to results. For example, the stock market pays investors in proportion to a firm's market capitalization and dividends, as informed by externally audited earnings in a wide variety of enterprises. Proportional prize contests can create new markets of this type, as long as each increment is measurable and additional to other successes. Like a stock market, the initial funds at stake are important, but their transformational power comes from revealing credible new information about relative performance that inspires others to invest and scale up success.

## How a Proportional-prize Contest Would Work

Creating a proportional contest starts by defining a measurable target—for example, value created by newly adopted agricultural innovations or

educational methods substantiated by an auditable form of impact data, such as controlled trials and adoption surveys. Multiplying gains per unit by the number of units gives an impact estimate. Where each innovation fills a different niche, these can be summed, revealing how much each has contributed to total measured achievement. To receive a share of prize funds, each innovator's impact data would have to be submitted for external audit, just as a stock market requires listed firms to use licensed auditors. The prize sponsor would specify the total funds and date of payment, for example \$10 million to \$20 million to be paid out annually on December 15. A contest secretariat would solicit applications and audit the data by visiting trial sites and survey locations before rewards are paid. Eligibility for prize rewards could be restricted, but a contest open to all innovations that improve agriculture in Africa would capture the widest range of successes.

To qualify for award funds, organizations would submit data from at least one controlled experiment to show gains per unit, and at least one survey to show the extent of adoption, documenting the value of a specific technique as it spreads. Applications could be invited from any private firm, public agency, NGO, or partnership able to demonstrate the value of any proprietary or public-domain innovation that they have helped to develop and disseminate. Contest sponsors would employ an independent secretariat to solicit submissions, visit field sites to audit the data, and compute measured value. Prize rewards would then be paid to each applicant in proportion to their share of total measured gains.

If the total prize fund were \$10 million or \$20 million per year, each applicant would receive a royalty-like payment per unit of measured gain that is a small but highly visible new incentive for success. The payment would serve as an audited

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3 Kimberly Elliott, "Pulling Agricultural Innovation and the Market Together" (Center for Global Development Working Paper 215, June 2010), [http://www.cgdev.org/files/1424233\\_file\\_Elliott\\_Ag\\_Innovation\\_FINAL.pdf](http://www.cgdev.org/files/1424233_file_Elliott_Ag_Innovation_FINAL.pdf).



**Indian children eat at their temporary shelter on the side of the road in Hyderabad. Is it possible to live on 50 U.S. cents per day in India without being considered poor? India's national economic planning commission recently backed away from redefining the poverty benchmark. | AFP Photo: Noah Seelam**

track record of achievement, demonstrating to other investors and adopters evidence of each prizewinner's recipe for success. Whatever the origin of success, knowing how, where, and for whom each intervention worked makes it possible to replicate and sustain each achievement.

Existing contests have not yet used proportionality, preferring the traditional approach of a fixed sum paid to the first or best entrant, plus any runner-up awards. A natural progression toward market-like incentives would be to pay in proportion to success, wherever auditable data on increments of achievement could be obtained. Agriculture and education are the most appropriate fields for such proportional prizes because

progress depends on a continuous flow of many innovations tailored to specific locations, times, and people—and controlled trials and adoption surveys are already routinely conducted to guide the programs of today.

### **Why the Proportional Approach Is Needed**

Under current circumstances, impact data on alternative approaches to improving agriculture and education are rarely comparable and almost never externally audited. As a result, it is very difficult for an investor, adopter, or donor to compare their options. Funding decisions are made subjectively, based only on proposals that cite past successes



and impact assessments in ways that can rarely be compared. Proportional-prize contests would help solve the information problem by generating credible, comparable performance data to guide further spending, informing both public agencies and private investors about what works best, where, and for whom. Such contests would be effective on the development frontier, where the central challenge is to identify and scale up recent, localized successes, which typically involve some combination of proprietary innovations with public-domain resources and ideas. A proportional contest can be open to both kinds of achievement, as well as partnerships and hybrid social enterprises under any type of intellectual property. Only outcome data is revealed, and results are externally audited to permit credible comparisons among the solutions.

Not all situations are suitable for proportional prize contests. Where goals are not measurable, more subjective allocation methods are preferable. Where the goals are measurable but not additional to one another, then a traditional lump-sum fixed prize would be preferable. And where past successes are scarce, more basic research would be needed to get started. But for agricultural development, education, and perhaps other fields, circumstances are now well suited for the introduction of contests with proportional payments.

## How New Contest Designs Can Improve Aid Effectiveness and Spur Innovation

The speed and extent of economic transformation depends on how quickly successful new solutions to important problems can be identified and scaled up. Pull mechanisms for open innovation offer a major step forward in incentive design, enabling governments, philanthropists, and private firms to specify desired outcomes and pay for success. Proportional contests, in which many successful

**A resident of Kaedi, in the drought-stricken South of Mauritania, is unable to find pasture for his cows. In a joint statement on February 15, 2012, USAID and other major donors called for urgent assistance to West Africa's drought-hit Sahel region. | AFP Photo: Pablo Tosco/Oxfam**

contestants would receive a share of the prize fund in proportion to measured gains, offer market-like adaptation of pull mechanisms for sectors such as agriculture, where success is incremental and location-specific.

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## In well-designed contests, one dollar in prize money attracts many dollars' worth of effort toward the desired results.

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The economic leverage by which small prizes attract large efforts comes from revealing hidden information about what works, where, and for whom. Proportional prizes will lead innovators to assemble existing and new data about their results, for audit by a credible secretariat, documenting the flow of prize-winning innovations to be scaled up by investors and adopters. Contests that reveal success have the power to create new markets, transform the development frontier, and fuel sustained growth where it is most needed.

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