Reducing Obesity: What Americans Can Learn from the Japanese

by Benjamin Senauer and Masahiko Gemma

JEL Classification: D12, I11

Japan has one of the lower rates of obesity, although it is increasing as virtually everywhere, and the United States has one of the highest rates of obesity in the world. Only 3.6% of Japanese age 15 and over had a Body Mass Index (BMI) over 30 in 2002, which is the international standard and is determined by dividing a person's weight in kilograms by their height in meters squared (Ministry of Health, Labor, and Welfare, Japan, 2002; WHO, 2006). In contrast, 32.0% of Americans age 20 and over were obese, and a total of 66% were either overweight (BMI over 25) or obese in 2003-04; some two-thirds of the adult population (NCHS, 2006). Because the distribution of body fat affects health risks and Asians tend to have more abdominal fat at lower BMI levels, the Japanese government uses a BMI over 25 to define obesity. For Japanese age 20 and over, the same age group as for the U.S., 25.6% had a BMI over 25, which is still lower than the U.S. rate. Much can be learned about how to reduce obesity in the United States if we can explain why the rate is so much lower in Japan.

Being obese and overweight is associated with an increased risk of many chronic diseases and premature death, plus significant increases in health care costs (WHO, 2006). Viewed at its simplest, a person gains weight when their caloric intake exceeds the calories expended through basic metabolism and physical activity. The average person in Japan both eats less and is more physically active than the typical American.

Food Consumption, Prices, and Dietary Traditions

The average daily intake of Japanese over one year old was 1,930 calories in 2002, whereas Americans ages 1-85 consumed 2,168 calories on average in 2001-02 (Ministry of Health, Labor, and Welfare, Japan, 2002; NCHS, 2006). The average adult in Japan is smaller in stature than the average American, thus obviously needing fewer calories. However, this factor explains only a modest portion of the difference of over 200 daily calories. Moreover, the average daily fat consumption in Japan was 54.4 grams, compared to 80.6 grams in the United States.

Food balance sheets, also referred to as food supply and utilization data, can be used to compare the per capita availability of calories back to 1960 in the two countries. The quantities of food available at retail are derived by applying conversion factors, which account for losses in processing and distribution, to the estimated supply of each agricultural commodity, such as potatoes. The nutrients across all food categories are aggregated to determine the nutrients available for consumption. The calories available rose only slightly in Japan between 1960 and 2003, from 2,291 to 2,558 (Ministry of Agriculture, Forestry, and Fisheries, Japan, 2005). Over the same period, the U.S. per capita availability of calories increased from 3,100 in 1960 to a rather astounding 3,900 in 2003 (ERS, USDA, 2006). While the increase from 1960 to 2003 was only 267 calories per capita in Japan, in the United States it was 800 calories per person. As expected, these figures are higher than actual caloric intake, which was provided in the previous paragraph. However, this data does suggest the sheer abundance of food, especially calorie dense food, Americans have available and, hence, are tempted by. A reflection of this is the “supersizing” of serving portions, with many Americans losing any sense of what a normal serving size should be.

Expenditures and Prices

As is obvious to anyone who visits Japan, food is considerably more expensive than in the United States. As a share
of total consumer expenditures, the average Japanese household spent 23.2% on food in 2003, 19.6% for food consumed at home, and 3.6% for food away from home (Ministry of General Affairs, 2005). In comparison, the average American household devoted only 13.1% of their total expenditures to food, 7.7% for food at home and 5.4% for food away from home in 2003 (Bureau of Labor Statistics, 2005). Per capita income is almost as high in Japan as in the United States, so this difference can not be explained simply by the decline in the budget share spent on food as incomes rise. The Japanese spent 84.5% of their total food expenditures for food at home, while Americans spent only 58.8%. Dietary content can be better controlled when preparing food at home than eating away from home.

A comparison of prices in 1999 found the overall price of food to be 49% higher in Tokyo than in New York City (Ministry of General Affairs, 1999). The authors made a simple comparison of prices in April 2006 in a grocery store in Tokyo and a supermarket in St. Paul, Minnesota. For a loaf of white bread, a carton of eggs, a pint of Haagen-Das ice cream, and five kilograms of medium-quality rice, the Tokyo prices were more than double those in Minnesota. The food supply chain is far less efficient in Japan, with more layers than in the United States, where intensive competition and information technology has substantially reduced distribution costs. However, given their high level of income, food prices have a limited effect on the Japanese level of caloric intake. A comparison of the relative prices of more healthy foods, such as fruits and vegetables, and other foods, such as fats and sugar, in the two countries would be an interesting topic, but is beyond the scope of this paper.

**Dietary Traditions:**
The traditional diet in Japan is built around a base of rice and other grains, with plentiful consumption of vegetables and fruits, and also fish, but relatively little animal fat, meat and sweets. In Japan, the presentation of the food is very important, and particular attention is given to the colors and textures. There is an old Japanese saying, “we eat with our eyes.” Portions are much smaller at Japanese restaurants or in home-prepared meals than is typical in the United States. An elegant dining experience might consist of dozens of small dishes, some no more than a few bites. The meal is meant to be beautiful, as well as delicious. Fruit is usually served at the end, rather than a rich dessert. Traditionally in eating, the Japanese have applied the concept of “enryo” (restraint) (Samuels, 2005). Although more Western foods are being eaten, traditional food customs are still quite strong in Japan.

On a recent visit to a daycare facility in Tokyo by the authors, the careful attention to the nutritional quality of the food provided was impressive. A sample lunch is placed under a glass cover for all the parents to see as they pick their children up at the end of the day. A newsletter provides the meal plan to the parents in advance and suggests foods to serve at home to nutritionally complement those provided at the daycare. In addition, unlike in most American schools, students are taught even at an early age to appreciate and respect food. The students must wash their hands before eating and are expected to use good table manners. They sit at low tables with small chairs and are served their trays individually. Before eating, they thank the farmers who grew the food and those who prepared it.

**Physical Activity and the Cost of Inactivity**
Another explanation for the much lower rate of obesity is that the Japanese are more physically active than Americans. However, this is not because they go to the gym or engage in planned physical activities more than Americans. Only 29.7% of Japanese age 20 and older reported they engaged in regular physical exercise activities in 2002 (Ministry of Health, 2002). In 2003, 46.0% of Americans 18 and over said they engaged in a moderate level of physical activity for 30 minutes or more at least five times per week, or a vigorous level for 20 minutes or more at least three times a week (U.S. Census Bureau, 2006). However, these figures may be inflated since they are self-reported.

**Walking**
The major difference is that Japanese walk much more in their daily lives than Americans. Walking is a simple, but effective form of exercise in which everyone except the disabled can engage. The average person in Japan, 15 years old and above, walked 7,421 steps per day in 2002, about 3 ¾ miles at 2,000 steps per mile (Ministry of Health, 2002). Men walked an average of 7,573 steps and women 7,140. A recent nationally representative survey of Americans on walking by Harris Survey found that men walked an average of 5,940 steps and women 5,276 (Hill, 2006). Pedometers were provided to participants in both surveys that counted their steps. The average
length of a step for the Japanese may be less than for the average American, who is taller, but only modestly so.

The Japanese walk an average of about 2,000 steps more per day than Americans, which burns about 100 additional calories (Shape Up America, 2006). The reason they walk more is they rely far less on automobiles and far more on mass transit to get around. The use of public transportation usually entails walking, since it does not take you from the door of your home to that of your workplace or other destination. Americans who commute to work in their cars or drive to go shopping may simply drive from their garage and then park only a few hundred feet or less from their workplace or the shopping mall, doing whatever they can to minimize any walking. Moreover, in crowded Japanese cities, the easiest way to get somewhere nearby is to simply walk.

Costs of Automobile Use and Public Transportation

There is an economic explanation underlying this disparity in walking between Japan and the United States. The cost of owning and operating an automobile is much higher in Japan, whereas the cost of using public transportation is lower. The Japanese co-author of this article owned a car when he lived in the United States for several years, but he does not own one in Tokyo because it is too expensive.

In terms of the costs of operating a car, the price of gasoline in Japan is about double that in the United States. In addition, the ownership and operation of a car is particularly expensive in Japan because of high automobile taxes and registration fees, mandatory bi-annual inspections, and high parking fees in large cities (Japan-Guide.com, 2006).

Anyone who lives in a large city and does not have a parking space for their vehicle must pay a parking fee, which is approximately $300 per month in Tokyo, some $3,600 annually. In densely-populated metropolitan areas, where a majority of the Japanese live, driving your own car is inconvenient. Major Japanese cities are not designed for commuting from outlying areas or traveling within the city by car. Unlike in the United States, cities do not have extensive networks of freeways and expressways or even many broad boulevards. In addition, most American cities have lots of underground and/or above ground parking structures; Japanese cities do not. On the other hand, major Japanese cities have some of the best mass transit networks in the world.

From the economists’ viewpoint, the time costs are much lower to use public transportation than an automobile in Japan. Unlike the United States, where many companies subsidize driving by providing parking for their employees or paying for their parking costs, in Japan, many businesses pay for their employees’ commuting costs using public transportation (Japan-Guide.com, 2006).

Lessons for the United States

The lower obesity rate in Japan reflects deep structural differences between the two nations. This study, therefore, highlights how challenging reducing the incidence of obesity will be in the United States. However, this comparison does suggest some possible approaches to addressing the problem of obesity. Policies that raise the cost of driving in the United States and make other forms of transportation more convenient, would increase walking in our everyday lives. The recent sharp increase in the price of gasoline is encouraging some Americans to switch from driving to mass transit (Peterson, 2006).

In most cities, mass transit and other alternatives to driving, such as walking and biking, have suffered from under-investment for decades. One of the factors keeping people in their cars is the inconvenience of public transportation, the high time costs, because of poor service. Encouragingly, a number of cities are expanding and improving their mass transit systems. There are fundamental contrasts between the two countries that limit the feasibility of mass transit in many areas of the United States. Although 79% of Americans live in urban areas, public transportation will never be a viable alternative for many, in part because of the complex daily travel patterns of numerous people (U.S. Census Bureau, 2006).

Therefore, other efforts must be made to make exercising more convenient, especially walking. More funds could be put into walking and bike pathways. Walking in many areas needs to be made safer from dangers posed by traffic or crime. Many sprawling U.S. suburbs do not even have sidewalks for walking along busy streets. Employers could give an extra half hour at lunch time to employees who used the time to walk or otherwise exercise. Companies and other institutions could provide on-site exercise facilities or subsidize athletic club memberships for their workers, which could pay off by reducing health insurance expenses. There are several programs, including America on the Move and 10,000 Steps, that provide blueprints to encourage walking for individuals and communities.

Changing Americans’ dietary habits will be difficult. Very high taxes have been imposed on cigarettes
and other tobacco products to improve the public's health. However, eating is not like smoking. Eating is both an absolute necessity and intrinsically healthy, whereas tobacco has unquestionably been shown to pose serious health risks. Some have proposed a tax on soft drinks and high sugar foods, which have a high caloric content and lack other nutrients (Squire, 2006). However, a tax on foods for the purpose of reducing obesity would be viewed by many Americans as interfering with the freedom of choice that is seen as the right of adult consumers. A subsidy that lowered the price of fruits and vegetables, encouraging their consumption, might be considered though. A major effort needs to be launched by the government, with the help of the food industry, to educate Americans on what normal serving sizes should be for various foods. Our nation's schools can help start changing young Americans' attitudes towards food from a predominant focus on convenience and quantity.

The key lessons from Japan are that Americans need to eat less, giving more attention to the quality of food and less to the quantity, and get more exercise, particularly by adding more walking to their daily lives.

For More Information


Available online: www.cdc.gov/nchs/nhanes.htm.


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Winners and Losers: Formula versus Competitive Funding of Agricultural Research

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State Agricultural Experiment Stations (SAESs) were established with federal formula funding by the Hatch Act of 1887. In 1955, the Hatch Act was amended and a number of subsequent formula funding programs were consolidated under the USDA Cooperative States Research Service (CSRS), which today is known as the Cooperative Research, Education and Extension Service (CSREES). Currently, all of the Hatch funds and a small amount of other formula funds go to SAESs. In 1977, CSRS established its first competitive research grant program. However, this program remained quite small until 1990, when it was re-named the National Research Initiative (NRI) Competitive Grants Program with a much larger funding authorization. Currently, the SAESs account for 60% of U.S. public agricultural research, with 7% of SAESs funding obtained from Hatch funds and 2.3% from NRI Grant funds (Huffman & Evenson, 2006b, pp. 107, 117-118). Hence, the SAES system has become relatively diversified in its funding sources after starting with only Hatch funding.

The composition of these funds has changed substantially over time. From 1980 to 2003, the USDA-administered federal formula funds declined by 57% or $124 million (2,000 dollars; Huffman & Evenson, 2006a). Over this time period, NRI appropriations increased by $120 million, but less than 40% of NRI funds go to the SAESs. The remainder goes to non-SAES units, especially those in non-land grant universities. Hence, CSREES funding of SAESs has fallen dramatically over the past 25 years. Other changes in SAESs' funding have also occurred since 1980. They include an 88% increase in grants and contracts from non-USDA federal agencies, a 51% increase in contract, grant, and cooperative agreement funding from USDA agencies other than CSREES, and a 100% increase in Congressional earmarks or special grants for research.

Prospects are that the funding composition will continue to change. In the Fiscal 2007 Budget of the United States, President George W. Bush proposed further reductions and eventually elimination of federal formula funding for agricultural research, while replacing these funds with a new competitive grants program for State Agricultural Experiment Stations with perhaps a regional focus. The proposal seems likely to be rejected by Congress, but new proposals to redirect federal formula funds seems likely to resurface in the future. This raises questions of who wins and who loses from such a policy change.

This article examines who wins and loses from a change in the composition of federal funding. We explore the implications by examining

• Differences in who sets the research agenda,
• Implications for priorities in long- and short-term research,
• Capacity to respond to local needs,
• Cost efficiency of distributing funds,
• Distributional effects across the states and regions,
• Payoff to society, and
• Sustainability of future funding.

Who sets the research agenda?
A major issue across alternative research funding mechanisms is who sets the research agenda. With federal formula funds, the research agenda is set by the states, either by the scientists, the SAES directors, or a combination of the two. With a national competitive grant program, the research agenda is set by CSREES, which uses input from the National Agricultural Research, Extension, Education, and Economics (NAREEE) Advisory Board and other advisory groups (Board on Agriculture and Natural Resources, 2001, pp. 86-89). The current CSREES grant agenda tends to take a national perspective, but is also subject to political influence from various lobbying groups, as well as fads in research and public administration. Because crop and livestock production is sensitive to local and regional geo-climatic and economic conditions, many important agricultural research problems are local or regional and not national in nature. If formula funds are eliminated or dramatically reduced, SAES directors in small heterogeneous states might find it difficult to undertake sufficient local agricultural research to meet local needs. Research and extension faculty would spend a greater proportion of their time writing proposals for federal grants and conducting research on grants based on Federal priorities, with a smaller share of their time addressing state-level research needs. Some experiment stations would also risk losing matching state funds, the amounts of which are tied to the amount of federal formula funds to be received. Hence, there is more at stake than just federal formula funds for agricultural research. Therefore, the influence of national, and perhaps regional, research interests would likely increase at the expense of the influence of local farmers, consumers, and agri-business firms.

How would changes affect the willingness of scientists to undertake longer-term research objectives?
Federal formula and state funding provide secure funding to scientists across a broad set of disciplines related to agriculture for undertaking projects that require sustained multi-year efforts before major objectives and large payoffs can be obtained. Examples of research that took decades to complete, but that generated very high payoffs, include the discovery of hybrid corn (Huffman & Evenson, 2006b, pp. 159-161) and of tillage systems that conserve soil and provide outstanding crop yields.

Uncertainty about when and if scientists will obtain competitive grant funding, coupled with typically shorter-run priorities in grant funding, reduces opportunities for long-term pursuits and shifts research efforts toward shorter-term projects with more predictable outcomes (Huffman & Just, 2000). A larger federal competitive grants program might have the advantage of leveraging state and federal formula SAES funding to focus on medium-term national needs. This focus, however, comes at the cost of reduced opportunities for long-term research. Also, for some states a significant reduction in formula funds might erode their overall capacity to undertake agricultural research. This would mean closing campus and outlying research facilities and research farms. Under the proposed changes in science policy, SAESs would lose flexibility to pursue long-term agricultural research objectives, while agricultural research with medium-term national or possibly regional objectives would gain.

Would changes affect the capacity of states to meet local and regional needs or to respond quickly to crises?
Examples of research efforts generating high-payoffs for locally-important crops include developing
• cultivation methods and new varieties of wild rice in Minnesota,
• blueberry cultivars with improved taste and yield in Maine, Michigan, and Vermont,
• wastewater management research in Maryland and North Carolina, and
• improved procedures for combating a new wheat rust in Kansas.

These types of projects are disadvantaged when research funds are allocated by national or regional competitive grant programs, either because these programs are cumbersome and time-consuming to organize, or because they cater to national or regional, and not local, research needs. Also, once scientists have been awarded a large, multi-year competitive grant to undertake a particular line of research, their effort is “locked-in,” and they are unable to redirect their efforts to important, new, and emerging local and regional issues. Hence, local research interests would lose and national research interests would gain.
What is the relative cost of distributing the two types of funding?

Compared to external competitive grants programs, formula funding has low administrative costs. Federal formula funds are distributed to the states by a fixed formula: part is allocated equally to all states, part is allocated to states according to their share of the farm and rural populations, and part is allocated for multistate research (Huffman & Evenson, 2006b, pp. 23-25). Allocation of these funds to individual research projects and scientists is under the control of the local SAES administration and is subject to local, but minimal national political pressure. Historically, SAES Directors have built ties to local clientele groups to help prioritize state research needs and have then integrated this information with the research capacity of their local scientists to allocate the total research budget. SAES administrators have generally required a small amount of proposal writing and evaluating, preferring that their scientists dedicate their efforts to conducting research and publishing discoveries. These administrators have a variety of tools for setting incentives for scientists, including repeat contracting and annual evaluations for salary increments.

In contrast, competitive programs significantly increase the amount of scientists’ time allocated to proposal writing, assisting with peer review of research proposals, and peer-panel decisions on which proposals to fund. In fact, a new layer of CSREES bureaucracy has been added to coordinate and administer the NRI and other national competitive grant programs. Costs imposed on scientists of competitive grant research are not funded by the NRI or by most other external competitive grant programs. At the current NRI research proposal funding rates of 5-12%, large amounts of resources are being consumed per dollar of research grant funding reaching scientists from this program (Huffman & Just, 1999a). In addition, while federal formula research funds do not pay indirect costs to recipient institutions, the NRI permits indirect costs equal to 25% of project direct costs.

Additionally, the Bush Administration’s grant program proposal suggests full funding of indirect costs, which would raise the current indirect cost rate on the NRI to an estimated 45-55% of direct project costs and use this higher indirect cost rate on the new grant program for the SAES. Although land grant universities vary in how they use the revenue from indirect costs, it is common for central administration to take 50% or more of these funds and for the remainder to be split between the college and department of the recipient principal investigators. It is unusual for the principal investigator(s) of an externally funded project to receive part of the revenue from indirect costs. Indirect costs are primarily an accounting concept and not an economic concept, and a university’s indirect cost rate for federal grants is a negotiated rate between the institution and the Office of Management and Budget (May & Sarson, 1999). Hence, the new Bush policy would significantly increase the amount of scientists’ efforts allocated to proposal writing and evaluating and the share of CSREES research funds allocated to university indirect costs. Central university administrators would in general win, but the SAES system would in general be losers. If non-land grant universities were eligible for new CSREES grant funds, then scientists and administrators outside the SAES system would be gainers at the expense of the SAES system. In fact, unless the pool of competitive grant funds is increased dramatically, the actual funds reaching SAES scientists will decrease.

Which states would be likely to gain or lose?

Competitive grant funding tends to favor institutions that have a large research infrastructure supporting research proposal writing and administration. In 1990, all but 11 SAES universities were eligible for new competitive grants included Massachusetts, New York, Florida, Michigan, Wisconsin, Arizona, California, and Oregon. In 2004 these same states, plus Maryland, Rhode Island, Kansas, Iowa, Illinois, Indiana, and Texas, were the leaders. The states that remain heavily dependent on formula funds are the ones likely to be the most disadvantaged by a shift toward increased funding through competitive grant programs. They are New Hampshire, New Jersey, W. Virginia, Georgia, Louisiana, Minne-

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1. Indirect cost revenue goes to pay for university administration, research facilities (infrastructure), and utilities to laboratories, which are not easily attributable to individual projects, and hence not permitted under project direct costs.

2. It is a data-intensive and time-consuming process for universities to document and defend their request for an indirect cost rate to the Office of Management and Budget (May & Sarson, 1999).
sota, Mississippi, Tennessee, South Dakota, Alaska, and Hawaii. The other 24 states would be small losers. See figure 1. In general, states where the SAES is part of a mid- to large-size land grant university outside of the South-Southeast would be winners and others would be losers, including states with a small agricultural sector. If the new grant program were regional in nature, this would provide a more equitable distribution of the research funds across regions, but it would sacrifice much of the potential gains from high scholarship.

**Would society gain or lose?**

Under the Hatch Act, federal formula funds are allocated for research across problems in agriculture, marketing, forestry, home economics, and rural and community development, which are researched from the perspective of several disciplines. Washington administrators sometimes suggest that this is too broad—topics or disciplines—or not adequately targeted on important national issues, reducing its overall impact. In addition, a claim is sometimes made that this research is not subject to rigorous research methods, and that projects are reviewed infrequently. But scientists working on these projects must publish in scholarly outlets in order to prosper professionally. Thus, the expectations set by their colleagues and university administrators are a critical factor affecting scientists’ efforts in research and other activities. As evidence that public agricultural research is productive, Huffman and Evenson (2006a) found that the social rate of return to public agricultural research remains high—about a 50% real rate of return. However, they also found that shifting federal formula to competitive grant programs would lower its impact and rate of return. In a related study, Huffman and Evenson (2006b, pp. 276-278) found that from this type of fund reallocation only California, Oregon, and Wisconsin would likely benefit from increased research productivity, while the other 45 contiguous states would likely see a decline in productivity. Hence, a case can be made for increasing federal formula funding.

The production process for scientific discoveries contains uncertainty. Scientific efforts result in a continuum of output from no discovery to a revolutionary discovery. Furthermore, unanticipated discoveries sometimes occur. Hence, the social payoff or value of any research project is initially unknown. The uncertainty to stakeholders in scientific discovery can be reduced by research administrators choosing to undertake a portfolio of diverse projects with diverse incentives for

![Figure 1. States likely to gain or lose from a CSREES increase of competitive grant funding and decrease in formula funding.](image-url)
discovery (Huffman & Just, 2000). This implies that more than expected returns are at issue. With a variety of research funding mechanisms, such as federal formula and competitive funding, it is possible for some scientists to be working with strong incentives for discovery and others with weaker incentives. Simultaneously, some can work on long-term goals and yet others on short-term or intermediate goals. Hence, a case can be made for larger competitive grant funding for selective national or perhaps regional priorities. Moreover, a diversified portfolio of projects and funding mechanisms decreases society's discovery risk.3

How would changes affect the sustainability of research funding?

If fewer dollars were allocated across the land grant system for formula funding, for example by eliminating formula funds to small SAESs, those dollars could be used to increase the research funds available for competitive grant programs. In this scenario, the country might not “need” more than 20 Colleges of Agriculture and SAESs, and perhaps could get by with even fewer. However, dramatically reducing the number of states receiving federal agricultural research funds would greatly change the political economy of federal agricultural research funding. One prospect is that, over time, the currently strong Congressional support for formula funds would wither under a competitive grant program, and total CSREES appropriations for competitively funded agricultural research would decline. State matching funds would also decline. Another possibility is that the excluded land grant universities would pursue Congressionally earmarked research funds or “special grants” on a grander scale (National Research Council, 2003, pp. 71-72; Huffman & Evenson, 2006b, pp. 116-117; Law & Tonon, 2006). Hence, a few states would win in the short run, but all might lose in the long run. There are also strong implications for complementary university instruction and public outreach (extension) programs of altering the nature of the complementary research support from formula funds.

Conclusions

Some will win and some will lose with changes in the size and relative amount of CSREES-administered formula and competitive grant funding for agricultural research. We conclude that a further reduction or elimination of federal formula funding of agricultural research will significantly impact

• Future research priorities and the research agenda,
• The composition of short- versus long-term research,
• The mix of national versus local needs research,
• The transactions costs of undertaking research,
• The distribution of research funds across the states,
• The distribution of research benefits across states,
• The rate of return that society earns from its research investments,
• The discovery risk faced by society, and
• The sustainability of future research funding.

Although recent research has shown that the social rate of return to public agricultural research would decline as the competitive grant share rises, we believe that the very considerable risks associated with future discoveries in agricultural research will be best diversified by maintaining a portfolio of CSREES administered formula and competitive grants funding in the future. Moreover, a case can be made for continuing and possibly increasing federal formula funding because of their high payoff and at the same time expanding competitive grant funding to address selective high priority national or perhaps regional needs.

For More Information

Huffman, W.E., & Evenson, R.E. (2006a). Do formula or competitive grant funds have greater impact on state agricultural productivity? American Journal of Agricultural Economics 88, 783-798.

3. The analogy to wealth management based on a criteria containing expected return and risk trade-offs is intended.


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