

C. Questions specific to performance pay

How large do performance incentives need to be in order to be effective?

Researchers agree that incentives must be large enough to matter to teachers or they will have little effect on teachers' classroom performance. It is not clear, however, how large performance incentives need to be because only a limited number of studies have explored this question. Podgursky and Springer (2007) conclude from their review of teacher performance pay that current research is not sufficiently robust to prescribe how systems should be designed, such as delineating the optimal size of bonuses. They note that "an overarching lesson seems to be that trial and error is likely required to formulate the right set of performance incentives" (p. 943). Hassel (2002), too, cautions that, "without further experimentation and research, it is impossible to state any kind of definitive number" (p. 27).

The issue of a meaningful or motivating pay increase that would increase worker performance is complicated because research in fields outside of education suggests that there are large individual differences between people that are not easy to control for or model. Varadarajan and Futrell (1984), for example, examined what private sector employees believe to be the smallest meaningful pay increase. Their review of the literature cited a range of 3.5 percent to 11.5 percent in prior studies. On average, employees in their own study reported that 7.5 percent was the smallest pay increase that they would consider meaningful. A similar study that used a salesperson sample

found that 5 percent was the smallest pay increase that participants considered attractive (Worley, Bowen, & Lawler, 1992).

Lazear (2000) found that even modest performance incentives could yield very large gains in productivity in one case study from private industry. When the company (a producer and installer of automobile windshields) switched to a performance-based pay system, average worker wages increased by slightly more than 10 percent. However, the average level of output per worker increased by about 44 percent, half of which was due to the average worker producing more because of incentive effects. The other half was due to an increase in average worker ability as a result of selection effects, i.e., hiring and retaining high-performing workers who were good at producing the desired output.

These results suggest that it is important to distinguish short- and long-term effects of incentives when determining how large performance incentives need to be. In the short run, the effect of the incentive is entirely due to motivation effects on the current workforce. It is therefore important to estimate how those who are already in the teaching force would respond to incentives of various sizes. In the long run, however, the incentive includes not only a motivation effect but also a selection effect, which inevitably changes who is in the teaching force. Lazear's findings suggest that incentives will attract new applicants, who are likely to fare well under performance-pay systems,

and retain high-performers who are successful at producing desired outcomes—in this case, student learning gains. Those who are less effective will self-select out because they will not qualify for rewards and will have less incentive to stay.

Determining the optimal size of an incentive is important because if incentives are too small, they will fail to motivate employees to change their behavior in ways that will lead to higher performance. If they are unnecessarily large, they may be popular with employees, but they will cost more than necessary to achieve the desired outcomes. McAdams and Hawk (1994) found that the median target payout in the private-sector bonus plans they studied was 5 percent and that plans targeting too much below that amount were perceived as less successful by the companies using them. They also found, however, that factors other than the payout were important and that bigger incentives were not necessarily better. They concluded that if communication and other working conditions were good, incentives of 15 percent appeared to exceed what was needed to prompt employees to change their practice.

Researchers agree that one of the primary reasons most early merit-pay programs in education did not work was that the size of the incentives was too small. Performance incentives for public school teachers have also been found to be small relative to those offered in private schools. The average performance incentive for public school teachers was roughly 2 percent of teachers' base pay in 1991. In contrast, the average performance incentive in private schools was 11 percent of teachers' base pay (Ballou & Podgursky, 1997).

Kelley, Heneman, and Milanowski (2000) note that some studies suggest that teachers in some situations do consider even small bonuses of \$1,000 desirable (see Hall & Caffarella, 1997; Kelley, 1996; Kellor & Odden, 1998). Few researchers, however, have examined the actual effects of very small teacher incentives on student performance. An exception is Lavy (2002), who examined the effects of two education interventions on high school student achievement that were implemented in Israel in 1995. The first intervention was a group-based incentive plan that awarded cash bonuses to schools for reducing dropout rates and improving scholastic achievement. Teachers received 75 percent of the funds as salary bonuses. In 1996, the bonuses ranged from about 1 percent to 3 percent of average teacher salary; the largest bonus awarded was \$715, and the smallest was \$200. The second intervention provided additional resources, such as additional staff and smaller teacher-student ratios, instead of cash awards, if schools met graduation and student achievement targets.

Lavy found significant gains in student performance in the schools participating in the teacher incentive intervention two years after the program was implemented, as measured by increases in the average number of credits per student and difficulty of coursework, the proportion of students taking graduation examinations, average scores and passing rates on these exams, and lower dropout rates. Though he also found increases in student credits units in the schools participating in the resources intervention, he found no reduction in dropout rates and concluded that the teacher incentive program was a more cost-effective approach.

Several studies of teacher attitudes toward school-based performance award programs in Kentucky and in Charlotte-Mecklenburg, North Carolina, revealed that on the whole, teachers considered the possibility of receiving a performance bonus a very desirable outcome (Heneman & Milanowski, 1999). Although teachers' positive valuations of the bonuses indicated that the performance award programs could have had strong motivational potential, the potential was not fully realized, in part because the size of the bonuses in these programs was quite small.

Teachers in Kentucky received \$1,300 to \$2,600, while those in Charlotte-Mecklenburg received even less, \$750 to \$1,000. Subsequent interviews with teachers in Charlotte-Mecklenburg revealed that teachers were highly critical of the small bonuses offered by the district, especially since the \$1,000 bonuses were typically less than \$600 after payroll taxes were deducted (Heneman, 1998). Teacher opinion varied, however, as to whether tripling the size of the bonuses would be any more motivational. In contrast, teachers in Kentucky did not view the size of their performance awards as insufficient and did not speak disparagingly of them in the same way that teachers from Charlotte-Mecklenburg did.

According to Heneman, these findings have several implications for the use of bonuses in school-based performance award programs:

Bonuses must be of a magnitude that is truly noticeable and meaningful to the teachers. At the Charlotte-Mecklenburg Schools, the relatively small bonus amount was uniformly commented on in negative terms by the teachers,

suggesting that the bonus was not the strong positive consequence it was intended to be. It would seem that for bonuses to have maximum motivational value (either as a signal of goal importance or as a reward for goal attainment) they must be a meaningful addition to teacher compensation, perhaps at least 5 percent of base pay. (p. 57)

Odden and Wallace (2007) offer similar advice to policymakers, noting that, "a general principle is that the average bonus awards should be at least between 4 and 8 percent of base pay which, at an average teacher salary of \$50,000, is from \$2,000 to \$4,000 per teacher" (p. 33). Likewise, Heneman, Milanowski, and Kimball (2007) emphasize:

Teachers must value the reward. The form (i.e., base-pay increase or bonus) and amount of performance pay must be sufficient to motivate teachers to seek it. Relatively small salary increases or bonuses (less than 2 percent of base pay) will not work. Performance-pay plans should not be built on trifling amounts of financial reward. (p. 6)

It is important to note that performance incentives will likely need to be much higher to reach a meaningful threshold for teachers in high-need schools, such as those participating in the federal Teacher Incentive Fund program, because these jobs generally require teachers to work under more difficult working conditions and require greater effort to bring student achievement to high levels of performance. As a general rule, the size of a performance incentive should reflect the amount of work that is required to attain it.

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We are grateful to Michael Podgursky, University of Missouri, and Anthony Milanowski, University of Wisconsin-Madison, for their helpful comments and suggestions.

The Center for Educator Compensation Reform (CECR) was awarded to Westat — in partnership with Learning Point Associates, Synergy Enterprises Inc., Vanderbilt University, and the University of Wisconsin — by the U.S. Department of Education in October 2006.

The primary purpose of CECR is to support Teacher Incentive Fund (TIF) grantees in their implementation efforts through provision of sustained technical assistance and development and dissemination of timely resources. CECR also is charged with raising national awareness of alternative and effective strategies for educator compensation through a newsletter, a Web-based clearinghouse, and other outreach activities.

This work was originally produced in whole or in part by the CECR with funds from the U.S. Department of Education under contract number ED-06-CO-0110. The content does not necessarily reflect the position or policy of CECR or the Department of Education, nor does mention or visual representation of trade names, commercial products, or organizations imply endorsement by CECR or the federal government.



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