

The Grassroot Institute of Hawaii  
is pleased to present

**Elementary Principles of Monopoly:**  
Government-run Schools  
Get Less with More

Harry Messenheimer, PhD  
Director of Research, Grassroot Institute of Hawai'i and  
Co-Founder and Senior Fellow,  
Rio Grande Foundation of New Mexico

February 2008  
GRIH Study #1006

*With a possible exception of prostitution, teaching is the only profession that I know that has had absolutely no productivity advance in the more than two thousand years since Socrates taught the youth of Athens. And I'm not so sure about prostitution.<sup>1</sup>*

*Richard Vedder 2001  
Distinguished Professor of Economics, Ohio University*

## Summary

In response to competitive forces innovation has been proceeding rapidly in the private sector. In contrast, the government sponsored monopoly of government-run schools has produced no innovation. Market like reforms are needed to spur innovation in government-run schools. This study presents evidence of the need for those reforms in K-12 education. It compares percentage increase in productivity in the private sector since 1992 to percentage decline of productivity of government-run schools over the same period.

The study cites Bureau of Labor statistics on average overall output per hour of work. Competitive forces have led to innovation in the private sector, increasing productivity by 41 percent since 1992. That means workers at the close of 2006 were on average producing 41 percent more goods and services per hour worked.

The study develops a similar measure for education where output is defined by total performance on reading and math tests administered to 4<sup>th</sup> and 8<sup>th</sup> grade students by the National Assessment of Education Progress. In contrast to the private sector, government schools' are subject to very little competition and so no innovation has taken place over the same period. The proof of this is in their declining productivity. For the nation as a whole government-run schools' workers at the close of 2006 were on average producing 14.4 percent less per hour worked than they were in 1992. For government-run schools in two states singled out in this study Hawai'i was producing 22.1 percent less per hour worked and New Mexico was producing 22.4 percent less per hour worked since 1992.

Even though they are producing less, monopoly government-run schools are paying their workers more. This is exactly the opposite of what would normally happen in a market setting, where they would have to respond to competitive forces.

We need to educate our kids by unleashing competitive forces that reward innovation. Vouchers or tax credits are two tools that take power away from the monopoly establishment and give parents the power of choice that will unleash those forces. Each option is a good first step in education.

---

<sup>1</sup> "Why Are the Public Schools Failing and What Can Be Done?" July 5, 2001 at policy forum sponsored by the Independent Institute. Transcript may be found at <http://www.independent.org/events/transcript.asp?eventID=18>.

## Introduction

For years most economists have been arguing for market like reforms in K-12 schooling.<sup>2</sup> Market like reforms would unleash competitive forces that reward innovation. The purpose of this study is to provide additional empirical evidence of the need for those reforms.

Taxpayers have been allocating an ever-increasing amount of resources to K-12 government-run schools over the last couple of decades. Yet we have seen little or no improvement in government-run schools' performance. Worse still, productivity in government-run schools has declined substantially since 1992. That seems shameful in contrast to increasing productivity in the private sector; where competitive forces have kept entrepreneurs innovating and improving at a rapid pace.

The common estimate of overall productivity used by economists is average output per labor hour. By that measure, how much has government-run schools' productivity declined? And how much has private sector productivity increased by comparison? We answer these questions using estimates for the percentage changes in productivity in government-run schools and the private sector since 1992.<sup>3</sup> We begin with the private sector.

---

<sup>2</sup> Most of the economic arguments for market like reforms may be found on the Milton and Rose D. Friedman Foundation website: <http://www.friedmanfoundation.org/friedman/Welcome.do>.

<sup>3</sup> 1992 is chosen because it is the first year that we have good data for education output as measured by performance on reading and math tests administered by the National Assessment of Education Progress.

# Innovation and Productivity Growth in the Private Sector

The most frequently cited estimate of overall productivity in the private sector is for “non-farm business” as provided by the Bureau of Labor Statistics. This estimate is based on inflation-adjusted measures of gross domestic product produced per hour of labor. Specific quarterly and yearly estimates can be found on the BLS website.<sup>4</sup>

The market determined price of each good and service in the estimate is used for weighting each quantity produced. That way we can add the market value of TV’s, toothbrushes, personal training and so on to obtain an estimate of overall output in dollars. The productivity estimate is obtained by dividing overall output (measured by its market determined value in dollars) by the total of labor hours used to produce it. The resulting overall productivity estimate is the average dollar value of output per hour of labor input. Our interest herein is how private sector productivity has grown (so that we can contrast it with the declining productivity in government-run schools). Estimated inflation-adjusted *annual growth* in non-farm business productivity by year beginning in 1992 is:<sup>5</sup>

Year	Annual Percentage Growth		Year	Annual Percentage Growth
1992	4.1		2000	2.8
1993	0.4		2001	2.5
1994	1.1		2002	4.1
1995	0.5		2003	3.7
1996	2.7		2004	2.7
1997	1.6		2005	1.9
1998	2.8		2006	1.0
1999	2.9			

Accounting for the effect of compounding, the overall increase in productivity beginning in 1992 is 41 percent. In other words, entities in the private sector are estimated on average to be producing 41 percent more goods and services per hour of labor input at the end of 2006 than they were at the beginning of 1992. Competitive forces have rewarded innovation, increasing productivity.

<sup>4</sup> Bureau of Labor Statistics productivity data available at: <http://www.bls.gov/lpc/home.htm>

<sup>5</sup> Source: Bureau of Labor Statistics

## **Declining Productivity in K-12 Government-run Schools**

Productivity in government-run schools is analogous to that of the private sector. We can estimate overall output per hour; and we can then contrast the declining productivity in government-run schools with increasing productivity in the private sector.

### ***Explanation of Productivity in K-12***

We begin with an explanation of productivity in producing education. The idea is to develop a measure of education output similar to the way private sector output is estimated. How much overall educating per hour of labor input actually gets accomplished by government-run schools?

Think of testing<sup>6</sup> a sample of students in government-run schools to see how well they are learning the “three R’s.” The test would produce an average score; say 200 points per student, for example. By multiplying the average test score by the total number of students enrolled we obtain an estimate of overall education output produced in units of total points-value achieved. Continuing with the example, if there are 10 million students then the estimated amount of education output produced, as measured by total points value achieved, would be two billion points (10 million students times an average of 200 points per student equals two billion points).

The estimate of productivity for government-run schools is education output divided by the number of labor hours used to produce it. Productivity measurement units for government-run schools are test points achieved per hour of labor input. Continuing with the example above, assume that it took two billion hours of labor input within government-run schools to produce the total output of two billion points. In that case productivity would be estimated to be one point achieved on the test per hour of labor input. Notice that these units are not directly comparable to private sector productivity. Education productivity is measured by test points achieved per hour of labor input; but private sector productivity is measured by dollars worth of output per hour of labor input.

We can, however, directly compare estimated rates of growth (in the case of private sector) to estimated rates of decline (in the case of government-run schools) over comparable time periods. The units in each estimate are percentage change per unit of time and are, therefore, directly comparable.

### ***Estimates of Declining Productivity in Educating***

We don’t have an all encompassing estimate of how well government-run schools are educating their students. But we do have widely-accepted indicators in math and reading produced by National Assessment of Education Progress (NAEP) tests since 1992 in most states, including Hawai’i and New Mexico. NAEP provides us with average test scores for 4<sup>th</sup> and 8<sup>th</sup> grades for math and reading.<sup>7</sup>

---

<sup>6</sup> The actual testing data available for estimating will be discussed in the next section.

<sup>7</sup> Other indicators such as science and writing have not been available until more recently. The initial trends of those indicators give me confidence that the limitation of using only math and reading results nevertheless produces a

To estimate the decline in productivity from one test to the next subtract the starting productivity from the ending productivity and divide that quantity by the starting productivity.<sup>8</sup> The detailed logic of the estimate is displayed in the following graphic where the starting productivity is indicated within the large parentheses that include the “Year 0” and ending productivity is indicated by “Year 1.” For example, “year 0” might be 1992 when the tests began and “year 1” would then be 1996 – the year the next set of tests was administered. FTE indicates the total of full time employment<sup>9</sup> for the year indicated, giving us productivity as output per unit of labor.

**Formula for Rate of Decline in Government-run Schools’ Productivity from an Initial Test (Year 0) to the Next Test (Year 1)**

$$\left( \frac{(\text{Points in Year 1}) (\text{Student Population in Year 1})}{\text{FTE in Year 1}} \right) - \left( \frac{(\text{Points in Year 0}) (\text{Student Population in Year 0})}{\text{FTE in Year 0}} \right) \div \left( \frac{(\text{Points in Year 0}) (\text{Student Population in Year 0})}{\text{FTE in Year 0}} \right) = \left( \frac{(\text{Points in Year 1}) (\text{Student Population in Year 1})}{\text{FTE in Year 1}} - \frac{(\text{Points in Year 0}) (\text{Student Population in Year 0})}{\text{FTE in Year 0}} \right) \div \left( \frac{(\text{Points in Year 0}) (\text{Student Population in Year 0})}{\text{FTE in Year 0}} \right)$$

The logic of the formula is modified so as to give reading and math productivity percentage rates of change equal weight in computing overall percentage rates of change.

NAEP tests were administered in 1992, 1996, 2000, 2003, 2005, and 2007. The following tabulation displays the productivity declines for New Mexico, Hawai’i and the nation:<sup>10</sup>

**Percentage Productivity Declines beginning in 1992<sup>11</sup>**

Period	NM	HI	National
1992 to 1996	-8.93%	-0.90%	-4.51%
1996 to 2000	-4.28%	-7.76%	-5.61%
2000 to 2003	-8.20%	-11.21%	-2.49%
2003 to 2005	-4.00%	-0.80%	-0.55%
2005 to 2007	0.97% <sup>12</sup>	-1.80%	-2.07%

Although only math and reading tests are used to estimate the percentage rate of productivity decline in government-run schools, there is plenty of anecdotal evidence that other measures of education output are following the same trend. Recent trends in NAEP tests of writing and science closely follow what is going on in reading and math. Nationwide results for NAEP 12<sup>th</sup> grade reading tests<sup>13</sup> have shown a decline since 1992.

---

good overall estimate of government-run educating. Test results for participating states may be found at <http://nces.ed.gov/naep3/>. By using them herein, I am by no means suggesting that NAEP test scores should be the education output objective. Rather, my view is that parents are best able to assess the indicators of how well their own unique children are being educated.

<sup>8</sup> The ending productivity is consistently less than the starting productivity, thus the decline.

<sup>9</sup> The number of FTE for each year can be found on the Census Bureau’s website at <http://www.census.gov/govs/www/apesstl.html>.

<sup>10</sup> Two quirks in the data used in estimating productivity declines are documented in the Appendix.

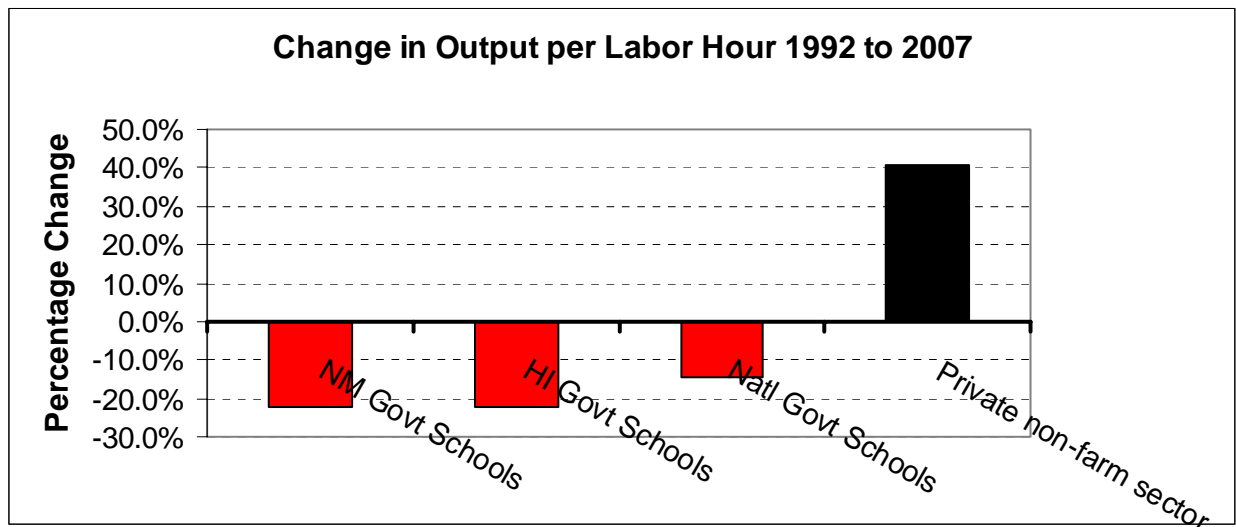
<sup>11</sup> The row labeled 1996 presents results from 1992 to 1996 while the row labeled 2000 presents results from 1996 to 2000 and so on.

<sup>12</sup> Yes, there was actually a slight increase from 2005 to 2007 in New Mexico!

<sup>13</sup> Results by state are not published for 12<sup>th</sup> grade reading.

## Conclusion

Innovation is not rewarded in government-run schools. Thus, we are not surprised that while productivity in the private sector has been increasing by leaps and bounds, productivity in government-run schools has been declining. Since 1992 productivity in the private sector has increased by 41 percent. Over the same period productivity in government-run schools has declined by 14.4 percent nationally, 22.1 percent in Hawai'i and 22.4 percent in New Mexico. This shameful conclusion is shown pictorially in the following graphic:



Looked at another way, since 1992:

- private sector productivity relative to government-run schools nationally has increased by a factor of 1.64
- private sector productivity relative to Hawai'i government-run schools has increased by a factor of 1.81
- private sector productivity relative to New Mexico government-run schools has increased by a factor of 1.82.

So far we have been assessing the decline in estimated average productivity for government-run schools. But there is another implication of this decline. It implies that the incremental productivity of labor,<sup>14</sup> that is the additional contribution to output of each additional unit of K-12 labor input, has been declining at an even more rapid pace. Because of competition in the private sector, such a decline would normally result in a commensurate decline in wages or a failed business. But not so in government-run schools where pay has instead increased

---

<sup>14</sup> Readers who have suffered through a course in microeconomics may recognize this as the marginal product of labor.

dramatically! The following table shows the dramatic increase in per pupil expenditures from 1992 to 2005 (in 2005 dollars).

**Per Pupil Spending in 2005 Dollars**

	FY05	FY92	Percentage Increase in Workers' Pay <sup>15</sup>
US	\$ 8,701	\$ 6,961	25.0%
HI	\$ 8,997	\$ 7,023	28.1%
NM	\$ 7,580	\$ 5,338	42.0%

Sources: Census Bureau, Bureau of Labor Statistics

Is it any wonder that the K-12 education establishment (administrators and teachers' unions) engages in frantic opposition<sup>16</sup> whenever the threat of competition challenges their monopoly status?

The policy conclusion of this empirical exercise seems obvious: Because of incentives to innovate, markets work and government sponsored monopolies do not. Let's educate our kids by unleashing competitive forces of the market, either by use of vouchers or tax credits, which take power away from the monopoly establishment and give it to parents.

---

<sup>15</sup> Salaries and benefits have remained fairly constant at roughly 80 percent of total spending, so these percentage increases are equivalent to the percentage per pupil spending increases going to labor.

<sup>16</sup> To wit, the recent election that overturned the universal tuition tax credit in Utah. As Milton Friedman wrote regarding California's Proposition 38 in the Wall Street Journal on July 11, 2000: "The teachers' unions that today control the government school monopoly would not relish that competition, even though they would have twice as much per pupil to spend as the size of the voucher. That is why they are going to such lengths to oppose Proposition 38, spending millions of their members' money on frantic political opposition."

## Appendix

There were two problems with the data. The first was that beginning in 2003 FTE estimates for Hawai'i appeared to be in error. The estimates were inconsistent with Hawai'i Department of Education (DOE) estimates and implied an implausible pay increase subsequent to 2003. To resolve the problem I used Census data until 2000 and then switched to DOE data (DOE data were not available prior to 2000). In essence I had to use the most recent, seemingly reliable data to make predictions about past FTE numbers.<sup>17</sup>

The second problem was with the timing of test scores for 8<sup>th</sup> grade reading. 8<sup>th</sup> graders were not tested for reading until 1998. They were next tested in 2002. To use the information from these tests I included the 1998 scores with 1996 and the 2002 scores with 2000. After 2002 the 8<sup>th</sup> grade reading scores were on the same schedule as other tests. Estimates of productivity declines were not sensitive to this problem.

---

<sup>17</sup> I am reminded of a quote often attributed to Yogi Berra: "It's tough to make predictions, especially about the future." Hawai'i is so poorly managed that it is also tough to make predictions about the past.