

Effects of Hold Harmless Provisions on School Funding Formulas

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Overview

- Many states use foundation aid programs to distribute revenues to school districts
- Often rely on foundation grant (FG) to determine revenues
 - Revenues are proportional to enrollments
($FG = FL * E$)
- Approach used to achieve goals such as equity, fiscal neutrality



Hold Harmless Provisions

- Many state formulas include “hold harmless provisions” (HHP)
- HHP = Modifications to funding formulas that limit revenue reductions for districts
 - Often introduced through political process
 - Initially intended to protect districts from harm due to funding formula changes
 - Commonly used to protect districts from revenue declines when enrollments fall
 - Very little research on effects of HHP on school funding (level, distribution, equity)



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Argument for HHP

- Revenues should correspond to costs
- Districts are harmed by FG when there are fixed education costs
 - As $E \downarrow$, revenues from FG decline faster than costs
 - As $E \uparrow$, revenues from FG rise faster than costs
 - Difference increases as fixed costs increase
- Even some variable costs may be “fixed” in short run for small changes in enrollments



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Table 1: Effects of Fixed and Variable Costs on Total Cost of Education – Four Options

Enrollments	Revenues from Foundation Grant	Total Cost of Education			
		Option(1): All education costs are variable	Option(2): \$2 million fixed education cost	Option(3): \$4 million fixed education cost	Option(4): All education costs are fixed
700	\$4.2 million	\$4.2 million	\$4.8 million	\$5.4 million	\$6.0 million
800	\$4.8 million	\$4.8 million	\$5.2 million	\$5.6 million	\$6.0 million
900	\$5.4 million	\$5.4 million	\$5.6 million	\$5.8 million	\$6.0 million
1000	\$6.0 million	\$6.0 million	\$6.0 million	\$6.0 million	\$6.0 million
1100	\$6.6 million	\$6.6 million	\$6.4 million	\$6.2 million	\$6.0 million
1200	\$7.2 million	\$7.2 million	\$6.8 million	\$6.4 million	\$6.0 million
1300	\$7.8 million	\$7.8 million	\$7.2 million	\$6.6 million	\$6.0 million
Average	\$6.0 million	\$6.0 million	\$6.0 million	\$6.0 million	\$6.0 million
Total	\$42 million	\$42 million	\$42 million	\$42 million	\$42 million

Notes: Under the foundation grant, districts receive \$6000 per student. In Option 1, total costs are calculated as 6000*enrollments. In Option 2, total costs are calculated as 2000000+4000*enrollments. In Option 3, total costs are calculated as 4000000+2000*enrollments. In Option 4, total costs are set equal to fixed costs of \$6 million.

State with seven districts and 7,000 students

$$FG = (\$6000) \times (\text{Enrollments})$$

Types of HHP

1. Economies of scale adjustment: Foundation level is a function of enrollments
2. Provide additional funding for districts with falling enrollments
3. Impose cap and/or floor on foundation grant
4. Provide alternatives to foundation grant
5. Use weighted average of past enrollments in foundation grant calculation



HHP in Indiana's 2004 Formula

1. FG used weighted average enrollments from past five years (“reghosting”)

$$FG = (\$4350) \times (wADM) \times (\text{Complexity Index})$$

$$CI_j = 1 + \beta_1 * NoHS_j + \beta_2 * OneP_j + \beta_3 * Pov_j + \beta_4 * FreeL_j + \beta_5 * LEP_j$$

where NoHS, OneP, Pov, FreeL, and LEP are measures of poverty, educational attainment, and English proficiency used for vertical equity adjustments.



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Indiana's Complexity Index

Complexity Index Component	Mean (std. dev.)	Weights in Indiana's Complexity Index	Intended Weights in Regression Model
% Adults in 2000 who Did Not Graduate from High School (<i>NoHS</i>)	18.37% (6.67%)	0.2000 (= \$870 / \$4,350)	+8.70
% Single-Parent Families in 2000 (<i>OneP</i>)	22.82% (7.59%)	0.1011 (= \$440 / \$4,350)	+4.40
% Population in 2000 Below Poverty Level (<i>Pov</i>)	8.38% (4.91%)	0.0506 (= \$220 / \$4,350)	+2.20
% Students Eligible for Free Lunch in 2004 (<i>FreeL</i>)	20.00% (11.08%)	0.2529 (= \$1,100 / \$4,350)	+11.00
% Students with Limited English Proficiency in 2005 (<i>LEP</i>)	1.40% (3.10%)	0.0713 (= \$310 / \$4,350)	+3.10



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HHP in Indiana's 2004 Formula

2. FG had a cap and a floor (2% of previous year's \$/pupil times current enrollment)
3. Two other options for total revenue:
 - Variable grant = last year's revenue/pupil times current enrollment
 - Minimum guarantee grant = last year's revenue plus 1%
 - Total revenue = Max[FG, VG, Min Guarantee]
 - Growing reliance on Min Guarantee (31% in 2000, 79% in 2004)



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Five Simulations

Model	Description
I	No changes were made in the state's funding formula
II	Weighted average enrollments were replaced by actual enrollments in the foundation grant calculation
III	The cap and floor on the foundation grant were eliminated
IV	The variable grant and minimum guarantee grant options for calculating total revenue were eliminated
V	All three of the hold harmless provisions in Models II, III, and IV were eliminated



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Effects on Total Revenue

Category	Model II: Use actual ADM in foundation grant	Model III: Remove caps from foundation grant	Model IV: Eliminate variable grant and minimum guarantee grant	Model V: Make all changes from Models II through IV
# districts would receive more total revenue	26	7	0	26
Average increase in per-pupil revenue	\$43	\$32	\$0	\$35
Total increase in revenue	\$5,248,888	\$3,118,860	\$0	\$3,351,640
# districts would receive less total revenue	8	22	249	266
Average decrease in per-pupil revenue	-\$12	-\$66	-\$134	-\$396
Total decrease in revenue	-\$450,228	-\$1,785,060	-\$105,878,295	-\$297,002,617
Net change in total revenue from Model I	+\$4,798,660	+\$1,333,800	-\$105,878,295	-\$293,650,977

Effects of HHP on Equity

- Vertical equity measure: $VE_k = \frac{b_k}{\beta_k^*}$

where b_k = estimated effect of k-th equity factor on per-pupil revenues, β_k = weight for factor as prescribed in funding formula

- Vertical equity achieved when $VE = 1$
- VE can be less than 1, negative, or greater than 1
- Horizontal equity measure: $HE = 1 - R^2$
 - Horizontal equity achieved when $HE = 0$

Correlations of CI Factors and Per-Pupil Revenues

Complexity Index Component	Model I: No changes made to funding formula	Model II: Use actual ADM in foundation grant	Model III: Remove caps from foundation grant	Model IV: Eliminate variable grant and minimum guarantee grant	Model V: Make all changes from Models II through IV
% Adults in 2000 who Did Not Graduate from High School (<i>NoHS</i>)	+0.303	+0.304	+0.303	+0.302	+0.708
% Single-Parent Families in 2000 (<i>OneP</i>)	+0.447	+0.450	+0.449	+0.462	+0.792
% Population in 2000 Below Poverty Level (<i>Pov</i>)	+0.520	+0.520	+0.524	+0.521	+0.836
% Students Eligible for Free Lunch in 2003 (<i>FreeL</i>)	+0.501	+0.503	+0.507	+0.520	+0.934
% Students with Limited English Proficiency in 2003 (<i>LEP</i>)	+0.120	+0.123	+0.125	+0.151	+0.399

Table 7: Coefficients from Multiple Regression Model of Vertical Equity Factors on per-Pupil Revenues for Education in Indiana, 2004.

Dependent variable = Per-pupil revenues (Y_j)

Estimated Coefficients (standard errors)

<u>Variable</u>	<u>Model I</u>	<u>II</u>	<u>III</u>	<u>IV</u>	<u>V</u>
% Adults in 2000 who Did Not Graduate from High School (<i>NoHS</i>)	1.49 (5.18)	1.50 (5.15)	0.93 (5.12)	0.26 (4.63)	8.56** (0.15)
% Single-Parent Families in 2000 (<i>OneP</i>)	8.44 (5.92)	8.59 (5.89)	7.57 (5.86)	7.52 (5.29)	4.88** (0.17)
% Population in 2000 Below Poverty Level (<i>Pov</i>)	33.57** (9.97)	33.11** (9.87)	33.53** (9.82)	27.61** (8.88)	2.98** (0.30)
% Students Eligible for Free Lunch in 2003 (<i>FreeL</i>)	7.66 (5.36)	7.72 (5.33)	8.38 (5.30)	8.66* (4.79)	11.11** (0.16)
% Students with Limited English Proficiency in 2003 (<i>LEP</i>)	-3.42 (8.58)	-3.16 (9.51)	-2.80 (9.46)	0.93 (8.55)	3.83** (0.29)
Intercept	4563** (117.60)	4565** (116.90)	4574** (116.29)	4516** (105.12)	4334** (3.51)
F-statistic (5, 286)	23.86**	24.07**	24.41**	25.05**	13260.77**
R-squared	0.29	0.30	0.30	0.30	0.99
Std. error of estimate (σ_e)	456.28	453.56	451.18	407.84	13.63

Table 8: Vertical and Horizontal Equity Measures for Indiana, 2004

Equity Measures	Model I	Model II	Model III	Model IV	Model V
<i>Horizontal Equity</i>					
(1-R ²) x 100%	71%	70%	70%	70%	0.43%
Std. error of estimate	456.28	453.56	451.18	407.84	13.63
<i>Vertical Equity</i>					
% Adults in 2000 who Did Not Graduate from High School (<i>NoHS</i>)	17.1%	17.2%	10.7%	2.99%	98.5%
% Single-Parent Families in 2000 (<i>OneP</i>)	191.8%	195.2%	172.0%	190.9%	110.9%
% Population in 2000 Below Poverty Level (<i>Pov</i>)	1,525.9%	1,505.0%	1,524.1%	1,255.0%	135.5%
% Students Eligible for Free Lunch in 2003 (<i>FreeL</i>)	69.63%	60.18%	76.2%	78.7%	101.0%
% Students with Limited English Proficiency in 2003 (<i>LEP</i>)	-110.3%	-101.9%	-90.3%	30.0%	123.5%

Conclusions

- HHP can greatly affect the level and distribution of school funding, and progress towards vertical and horizontal equity.
- Little impact individually in Indiana due to heavy reliance on Minimum Guarantee grant. Collectively, though, impact is much more substantial.
- HHP are the primary source of inequity
- Policymakers should conduct simulations to determine full impact of provisions before they are adopted. Are losses in equity offset by the benefits of HHP?