A RESPONSE OF HIGH SCHOOL TEACHERS TO THE ADOPTION OF STATE ECONOMIC STANDARDS

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ABSTRACT

This paper addresses the recent adoption of economics standards in the state of Indiana. The analysis is based on responses to a survey instrument that was designed to obtain information about the demographic profile of high school economics teachers, their coverage of topic areas included in the economics standards, and the critical challenges they face as high school economics teachers. We find that while virtually all teachers in our sample deviate from the standards, the magnitude of the deviation is small, and occurs in a predictable way. Most teachers appear to spend slightly less time on microeconomics (43.2% versus the mandated 50%) and international economics concepts (9.1% versus the mandated 12%) in favor of additional personal finance topic (19% versus 10%). As a result, the standards appear to be moderately successful in achieving its intended goal of creating convergence in content coverage in high school economics curricula.

INTRODUCTION

Two evident empirical trends in high school economics education are: the higher proportion of high school students who take an economics course and the substantial increase in the number of states that have adopted economics standards for inclusion in the high school curriculum. Between 1961 and 1994, the percent of high school students taking an economics course rose from 16 percent to 44 percent (Walstad, 1992; Walstad and Rebeck, 2000). The number of states that have adopted economics standards either voluntarily or as a result of mandates increased from 38 to 48 between 1997 and 2002 (NCEE, 2003). Moreover, between 1982 and 2002, the number of states that required that some type of economics course be offered in high schools increased from 7 to 17. Notwithstanding these trends,

assessments of the performance of students and adults in economic literacy indicate significant deficiencies in knowledge about economic concepts and current issues (Walstad and Soper, 1988). Unsatisfactory results in economic literacy raise many questions including issues surrounding the impact of economics standards on economic literacy.

Assuming that the standards are appropriate, one reason this discrepancy might occur is because high school teachers fail to follow the standards. Due to time constraints, perceived student interest, or other factors, teachers may deviate from the recommended amount of time spent on "core economic concepts", thereby reducing the economic literacy of their students. The Indiana standards, established in 2001, are based on the National Council on Economic Education (NCEE) national voluntary economic standards published in 1997. As such, Indiana provides an interesting case study (which may be applicable to other states) to determine whether or not high school teachers are, in fact adhering to these standards.

This paper addresses the recent adoption of economics standards in the state of Indiana. Our maintained hypothesis is that on average, teachers are adhering to the state standards. Analysis of our hypothesis is based on responses to a survey instrument that was designed to obtain information about the demographic profile of high school economics teachers, their coverage of the topic areas included in the economics standards and the critical challenges they face as high school economics teachers. While our study is not intended to provide conclusive evidence about the connection between the adoption of economics standards and student learning outcomes, it does provide a foundation for future research in this area. For example, if we fail to reject the null hypothesis, then the aggregate allocation of time spent on each content area of economics should not impact student literacy (assuming that the standards are appropriate) as teachers are adhering to the standards. As such, future research should investigate how content allocation *within each mandated area* impacts economic literacy. Alternatively, if we reject our null hypothesis, then future research specifically needs to address the magnitude of the tradeoff between aggregate content coverage and learning outcomes.

Analysis of the survey responses indicated that on average; about 43 percent of class time is spent teaching microeconomic topics. About 28 percent of class time is spent on teaching macroeconomic concepts, 9 percent of class time is spent on international concepts, while 19.5 percent is allotted to personal finance concepts. Virtually all teachers in our sample deviate from one or more of these guidelines; however, the actual magnitude of the deviation is small, and in most cases insignificant. On average, most teachers spend slightly less than the mandated

amount of time on microeconomics and international economics in favor for additional time for personal finance content. Additionally, we find no (jointly) significant differences in content coverage by instructor characteristics such as time constraints, perceived student interest, gender, teaching experience, and degree earned.

The next section provides background information on the adoption of economics content standards in Indiana. This is followed by a discussion of the data collection process and the demographic profile of the sample of high school teachers. The remaining sections provide our empirical methodology, our results, and concluding remarks.

ECONOMIC CONTENT STANDARDS

In 1993, the National Council on Economic Education updated its publication, *A Framework for Teaching the Basic Concepts* first published in 1977. The basic content concepts were subdivided into four categories: Fundamental Economic Concepts, Microeconomic Concepts, Macroeconomic Concepts, and International Economic Concepts. The Fundamental concepts were to be introduced at the K-4 grade levels, if they were not introduced then, then at the 5-8 grade levels, the Fundamental Concepts could be either introduced or re-taught along with the introduction of Micro- and Macro-economic topics. If none of the aforementioned topics were taught at the K-8 grade level, then at the 9-12 grade levels, those concepts would be reintroduced and or presented for the first time along with the International Concept area.

In 1997, the National Council on Economic Education in partnership with the National Association of Economic Educators and the National Foundation for Teaching Economics produced new standards for economics entitled, *The Voluntary National Content Standards in Economics.* These standards replaced the 1993 *Framework* and introduced 20 content standards along with benchmarks on attainment levels for students in grades 4, 8, and 12.

The adoption of economic content standards in Indiana represented the culmination of efforts that began in Fall 1998 with meetings involving teachers from elementary, secondary, and post-secondary institutions, state department of education specialists, and legislature personnel. These meetings focused on development of standards for English, math, science, and social studies for Elementary, Middle School, and High School grade levels. The social studies component consisted of standards for World History and Civilization, World

Geography, U.S. History, U.S. Government, Psychology, Sociology, and Economics. The foundation for the Economics standards was taken from the National Council on Economic Education's National Voluntary Standards published in 1997. The members of the Indiana's Education Roundtable for Economics took the 20 standards that were developed by the National Council and collapsed those standards into eight standards: Scarcity and Economic Reasoning, Supply and Demand, Market Structure, the Role of the Government, National Economic Performance, Money and the Role of Financial Institutions, Economic Stabilization, and Trade.

Within each standard, student achievement benchmarks were identified. In the final phase, recommendations from representatives of the financial sector led to the inclusion of personal finance[1] benchmarks in six of the eight standards. These standards and benchmarks were recommended by Indiana's Education Roundtable and adopted by the State Board of Education in 2001. Based on the benchmarks listed under the eight content standards for Indiana, the expected allocation of content coverage is 50 percent for Microeconomics, 28 percent for Macroeconomics, 12 percent for International economics concepts, and 10 percent for Personal Finance topics.

DATA COLLECTION

Using a list of both public and private high schools provided by the Indiana Department of Education (IDOE, 430 surveys -- 394 to public high school teachers and 36 to private high school teachers) were mailed in October 2003 to individuals designated by the IDOE as economics instructors. The survey instrument sought to obtain information on content coverage in the areas of Microeconomics, Macroeconomics, International Economics and Personal Finance. Teachers were asked to determine the number of class periods that they spent on each content area. The participants had the option of stating that their school corporation used either a "standard" 50 minute class periods or "block scheduling" of 90 minutes. If participants indicated that they used "block scheduling" we determined that one class in "block scheduling" equated to two classes for standard classes. The class periods were then added to determine the total amount of time that was spend on all issues. The amount of time within each topic area was divided by the total amount of time spent on all issues to determine the proportion of time allocated to each topic area. In addition, the survey asked respondents to report demographic information, educational attainment, areas of educational interest, economic subjects enrolled in

at undergraduate and graduate levels, teaching materials used, the amount of time spent in economic content areas, and two open ended questions areas; one consisting of their thoughts on changes that have occurred during the past 10 years in economics, the other challenges that they, as teachers, face in economics education.

Teachers were asked to complete and return the questionnaire within a two-week time frame. A self-addressed, stamped envelope was also included with the questionnaire. After two-weeks, a follow-up letter, questionnaire, and self-addressed envelope were sent to those teachers who had not responded. Of the 430 potential recipients, 103 individuals returned the questionnaire to the researchers, with 100 deemed useable. Three questionnaires were not used because those teachers did not include information about the length of time they spent on economic content areas. These teachers were contacted by telephone and were asked to reply to the teaching content area either via email, telephone interview, or completing another mailed questionnaire. None of the three individuals responded. That made a useable response rate of 23.3 percent.

TEACHER DEMOGRAPHICS

The data set contains information on 100 economics teachers from 97 public and 3 private high schools in Indiana. Table 1 gives the names and definitions for the primary variables uses in our analysis, while Table 2 provides a profile of the sample of the teachers. Table 3 provides additional summary statistics for the variables used in the empirical analysis.

Table 1: Variable Names and Description

Variable Name	Description
AGE	Age of teacher in years
TEXP	Years of teaching experience
ECEXP	Years teaching experience in economics
UNEC	Hours of undergraduate economics courses
GREC	Hours of graduate economics courses
PMICRO	Percentage of class periods spent on microeconomic topics
PMACRO	Percentage of class periods spent on macroeconomic topics
PINTER	Percentage of class periods spent on international topics

Table 1: Variable Names and Description	
Variable Name	Description
PPERF	Percentage of class periods spent on personal finance topics
GAP	Difference between actual allocation of class periods and allocation prescribed by state content standard
GENDER	1 if male
ECMAJ	1 if teacher undergraduate major is economics
INSERV	1 if teacher attended a program/workshop sponsored by the Indiana Council on Economic Education or a local Center for Economic Education
GRTR	1 if teacher completed a masters degree
NOTIME	1 if teacher indicated that time to meet standards/cover material is a major challenge
CORE 40	1 if respondent teaches a college prep economics class
STMOT	1 if a lack of student interest in economics is a primary challenge for teacher
ETEACH	Number of economics courses presently being taught

The average age of economics teachers is 46.6 years and they have been teaching economics for 12.9 years. Every teacher holds an undergraduate degree and 82 percent have a masters' degree. Only 6 percent of the sample majored in economics, 65 percent in social studies. Of those holding undergraduate degrees, 72 percent of the teachers received their degree before 1984. This is significant because prior to 1984, teachers only needed six hours of economic undergraduate course work in order to be certified to teach economics by the Indiana Standards Board (Indiana State Board of Education, 169 and 1984). (Even though only 6 hours of economics courses were required prior to 1984, the vast majority of teachers in our sample – 70 percent – earned more than 6 hours of economic credit. In fact 55 percent of the sample actually earned 12 or more credit hours in economics. Of the teachers who hold a Masters' degree 85 percent have that degree in Secondary Education with 44 percent emphasizing social studies, and 36 percent emphasizing economics. At the undergraduate level 95 percent and 93 percent of

the teachers responding stated that they had a course in either Microeconomics or Macroeconomics respectively; the primary courses taken at the graduate level were Advanced Microeconomics and Advanced Macroeconomics (16 percent). Along with the teaching of economics, 42 percent teach government and 37 percent teach U.S. history. The results of the questionnaire also reveal that 65 percent of the teachers teach "academic or Core 40" economics, 42 percent teach an "applied" economics course, 13 percent teach "A.P. economics" and less than 1 percent teaches "global economics."

Table 2: Teacher Demographics

Description	Percentage
Gender	
Male	75%
Female	25%
Age Distribution	
24 – 29	5%
30 – 39	17%
40 – 49	34%
50 – 59	38%
50 – 69	6%
Experience: Number of Years Teaching	
1 – 9	23%
10 – 19	16%
20 – 29	33%
30 – 39	24 %
40 – 49	4%
Experience: Number of Years Teaching Economics	
1 – 9	46%
10 – 19	28%
20 – 29	14%

Table 2: Teacher Demographics	
Description	Percentage
30 – 39	11%
40 – 49	1%
Undergraduate Degree	
B.A. or B.S.	100%
Year of Undergraduate Degree	
Before 1984	72%
After 1984	28%
Undergraduate Major	
Social Studies	63%
Business Ed.	14%
Economics	6%
Other	17%
Social Studies Supporting Area	
History	72%
Economics	72%
Government	59%
Western Civ.	37%
Sec. Social Studies 28%	
Geography	28%
Psychology	19%
Other	13%
Graduate Degree	
Master's Degree	82%
No Graduate Degree18%	
Year of Graduate Degree	
Before 1984	61%
After 1984	39%

Table 2: Teacher Demographics	
Description	Percentage
Graduate Major	
Secondary Ed.	69%
School Admin.	4%
Other	27%
Graduate Major: Percent with Emphasis Area	
Social Studies	44%
History	37%
Economics	36%
Government	20%
Business Ed.	17%
Sociology	15%
Psychology	12%
Political Science	11%
Geography	8%
Other	8%

A brief comparison of the survey results with the findings from a previous survey of high school economics teachers (Valentine and Quddus, 1998) indicated a number of changes. Since 1998 there has been a decrease of four percentage points from 79 percent to 75 percent in the number of males and a corresponding increase in percentage points of females teaching economics. The average age of the teachers increased by two years and the average number of years teaching and the average number of years teaching economics both rose by one year. The number of teachers who obtained their undergraduate degree prior to 1984 has increased six percentage points from 66 to 72 percent, while those holding an undergraduate degree in social studies declined from 84 percent to 62 percent. Those teachers possessing a Masters' degree decreased by one percentage point to 82 percent, however, those that had obtained their Masters' degree prior to 1984 increased seven percentage points. Of those holding Masters' degrees, there was an increase of 52 percentage points within the secondary education area and an increase of 17

percentage points within the social studies emphasis area. In addition, there was a decrease of 10 percentage points from 46 percent to 36 percent of those teachers who have a secondary education major with an economics emphasis.

EMPIRICAL METHODOLOGY

Our study operates under the null hypothesis of no difference between the proportion of (and mean/median) time suggested in the State mandates and those reported by the teachers in our data set. From a managerial perspective, we tentatively assume that the teachers in our sample are complying with the State standards. We utilize five basic measure of compliance. The first four are the proportions of time teachers report spending on the four core competency areas (microeconomic, macroeconomics, international economics and personal finance) treated individually. A fifth measure (defined as GAP) is constructed to measure divergence from the State standards based on each of the five measures taken jointly. This measure is constructed as the sum of the absolute deviations between the reported proportions and those suggested State standards. Thus, the larger the gap measure, the larger the disparity between the actual reported proportions and those proposed under the standards.

Table 3 reports summary statistics for our five measures of compliance. On average, about 43 percent of class time is spent teaching microeconomic concepts. About 28 percent of class time is spent teaching macroeconomic concepts, 9 percent is spent on international concepts, while 19.5 percent is allocated to personal finance concepts. The overall gap measure (GAP) has an average value of .336, which indicated that there is misalignment between teaching practice and the content standards.

Table 3 :Summary of Statistics for Variables used in the Analysis

Variable	Mean	Median	Std. Deviation
PMICRO	0.432	0.422	0.103
PMACRO	0.282	0.288	0.098
PINTER	0.091	0.091	0.046
PPERF	0.195	0.179	0.137
GAP	0.336	0.283	0.207
AGE	46.580 47.5	9.971	

Table 3 :Summary of Statistics for Variables used in the Analysis			
Variable	Mean	Median	Std. Deviation
GENDER	0.075	1	0.435
TEXP	20.900	22	11.456
ECEXP	12.910	10	9.874
ECMAJ	0.060	0	0.239
CORE 40	0.650	1	0.479
UNEC	11.970	12	6.389
GREC	3.020	0	4.662
NCEE	0.390	0	0.490
JA	0.400	0	0.492
ICEE	0.520	1	0.502
NOTIME	0.380	0	0.488
STMOT	0.320	0	0.469
ETEACH	1.220	1	0.462
PETEACH	0.639	0.667	0.293
INSERV	0.650	1	0.479
UNECDV	0.550	1	0.500
TEXPDV	0.640	1	0.482
PCTDV	0.600	1	0.492
SMALL	0.210	0	0.409
MID-SIZE	0.320	0	0.469
LARGE	0.230	0	0.423
EXTRA-LARGE	0.240	0	0.429
Number of Observations	100		

We formally test our null hypothesis using a stepwise approach. First, we conduct a series of simple hypothesis tests to determine whether the reported

proportions are (individually significantly different from the State mandated values. We also conduct a simple hypothesis test to determine whether the GAP mean is significantly greater than zero. Rejecting the latter indicates that respondents are not (on average) complying with the mandates jointly. Additionally, we conduct these simple hypothesis tests using the (nonparametric) sign test to determine whether teachers are complying with the mandates on the median, as well as the mean.

A drawback to these simple tests is that they do not control for other (we assume exogenous) factors that might impact whether or not teachers are complying with the state mandates. To the extent that our survey allows, we examine this possibility by conducting a series of additional tests. First, we create a series of cross-tabulations (with corresponding chi-square tests of independence) to determine whether these factors individually impact our four proportional measures. Because cross-tabulations require discrete data, we decompose each of our four proportional measures into two categories; those teachers who report that the proportion of time meets or exceeds State standards, and those whose proportion falls short of the standards.[2] For the GAP variable (which cannot easily be decomposed into discrete classifications) we utilize one-way (nonparametric) ANOVA to conduct a similar series of tests.

Lastly, we utilize regression techniques to determine whether these exogenous factors jointly impact compliance (or non-compliance).[3] Because none of our five compliance measures are likely to meet the criteria for consistent estimations via ordinary least square (OLS), we choose to utilize limited dependent variable techniques. For each of our four proportional measures, we employ a binary logit model, where the dependent variable of interest takes a value if one if the reported proportion meets or exceeds State guidelines and a zero otherwise.

Transforming the GAP variable is more problematic, because it is less easily categorized into discrete classifications. As before, we choose an approach that is both parsimonious and consistent with our prior analysis. Specifically, we sort the data from smallest to largest and create a series of binary variables that distinguish the observations based on quartiles. Each dummy variable gives a value of one if an observation falls into a particular quartile and zero otherwise. Since a higher value for GAP implies more extreme divergence from the standards, those observations in the first quartile are relatively close to full compliance, while those in the fourth quartile are not close to compliance.[4] Each of these dummy variables can be used as the dependent variable in a binary logit regression to determine whether the exogenous factors significantly and jointly impact compliance. Finally, we create a stepwise variable (or ordered ranking variable) that combines these four

dummy variables into a single, discrete variable. This metric gives a value of zero if an observation for GAP is in the first quartile, a value of one if it falls in the second quartile, and so on. This allows us to combine the information from the previous four regressions into a single equation, which can be estimated with an ordered logit model.

Our interpretation of these regression analyses is twofold. First, by examining the chi-square tests for model significance (where the null hypothesis is that the regression does not provide any additional information than the basic descriptive statistics and hypothesis tests); we can determine whether controlling for these exogenous factors jointly influence compliance. If we fail to reject the test for model significance, then the results presented in the simple hypothesis test can be interpreted as robust, even when controlling for these exogenous characteristics. Secondly, if we reject this hypothesis, we can examine the signs and significance of the coefficient estimates to determine which factors significantly influence compliance, holding the other regressors constant.

All regression equations utilize the same set of independent variables, which represent various teacher (and school) attributes and perceptions that have been identified as important influences on student achievement in the economics education literature. These include: CORE 40, NCEE, JA, ICEE, UNEC, NOTIME, STMOT, GENDER, TEXP, PCTDV, INSERV, SMALL, LARGE, and EXTRA-LARGE. The rationale(s) for including each independent variable are as follows. Teachers responsible for teaching college preparation economics class (CORE 40) are presumed to be more familiar with guidelines for topic coverage. Use of the National Council on Economic Education (NCEE), Junior Achievement (JA), and/or Indiana Council on Economic Education (ICEE) materials serve as another indication of the awareness of relevant information pertaining to economics content standards.

Undergraduate training in economics (UNEC) is expected to influence compliance since a greater awareness of content standards is likely to lead to a smaller gap between classroom instruction and the expected allocation implied by content standards. Teachers indicating time management issues (NOTIME) related to the implementation of content standards can be expected to be more sensitive to over or under-coverage of topics listed in the content standards. The importance of student effort and interest in economics has also been identified as a key determinant of the learning process, since student motivation can serve to undermine the learning process. Thus, perceived challenges in motivating students (STMOT) may

adversely affect the alignment of topic coverage with prescribed coverage in the content standards.

The experience of teachers, both overall and in economics instruction (TEXP and PCTDV) is predicted to have a favorable impact in adjusting to economics content standards, as should attending a workshop provided by one of the councils on economic education (INSERV). We have no priori expectations about the relationship between content coverage and gender or school size.

EMPIRICAL RESULTS

The results for the simple hypothesis test are contained in Table 4. Mean values indicate that teachers spend slightly less time teaching micro and international topics relative to the standards, and slightly more time teaching macro and personal finance topics. Analysis of the parametric tests indicates that the (mean) proportions of time spent teaching microeconomics, macroeconomics, and international economics topics are not statistically different from the State standards. However, the proportion of time spent teaching personal finance is significantly different (and above) the standard. The GAP variable is also significantly greater than zero at 95 percent confidence or better. These results imply that, at the mean, teachers are "shaving" the proportion of time spent teaching economics, particularly micro and international economics (such that they do not deviate too far from the standards), and re-allocating that time to personal finance topics.

The nonparametric tests presented in Table 4 not only reinforce the results of the parametric tests, but also do so with a higher degree of statistical significance. Approximately 80 percent of the teachers in the sample spend less time (relative to the State standards) teaching microeconomic and 74 percent spend less time on international economics. Conversely, this time is spent teaching personal finance. Moreover, as evidenced by the GAP variable, every teacher in the sample deviates from the standards to some extent. A plausible interpretation of the results is that while virtually all teachers in the sample deviate from the standards, they do so in a predictable fashion. Additionally, when they do deviate, they are careful (at least on average) about the magnitude (or proportion of total class periods) from which they deviate from the individual standards.

As a robustness check, we also ran a nonparametric test with the null hypothesis that the population median for the GAP variable was equal to the sample mean (0.336). The results show that we reject the null at better than 95 percent confidence. This finding provides two insights. First, it supports our earlier

assertion that teachers are deviating from the standards. Second, rejecting this test indicates (but does not conclusively prove) that the distribution of the GAP variable is non-normal. As such, when conducting analysis of variance on the GAP variable, it is necessary to resort to nonparametric techniques (i.e., the Mann-Whitney analog to ANOVA).

Table 4: Simple Hypothesis Tests for Convergence to State Standards

Parametric Tool for Convergence based on Mean Values					
Variable	Mean/Sample Portion	Hypothesized Value	Std. Error	Z-Stat.	
PMICRO	0.432	0.5	0.05	-1.36	
PMACRO	0.282	0.28	0.045	0.045	
PINTER	0.091	0.12	0.032	-0.892	
PPERF	0.195	0.1	0.03	3.167**	
GAP	0.336	0	0.021	16.232**	
Non-Parametric (Sign) Tests for Convergence based on Median Values					
Variable	Hypothesized Median	No. Above	No. Equal	No. Below	Z-Stat.
PMICRO	0.5	19	80	1	-6.131**
PMACRO	0.28	54	46	0	0.800
PINTER	0.12	26	74	0	-4.800**
PPERF	0.1	75	25	0	5.000**
GAP	0.336	35	65	0	-3.000**
GAP	0	100	0	0	10.000**

** indicates statistical significance at 5% or better

Table 5 presents the cross-tabulations and chi-square tests of independence between our proportional variables and exogenous variables. We find no significant relationship (i.e., we fail to reject the null hypothesis of independence) between failing to meet (or meeting/exceeding) the standards and whether or not teachers used NCEE or JA materials, the number of undergraduate credit hours in economics earned by each teacher, perceived lack of student interest, gender, years of teaching experience, the percent of that experience spent teaching economic, whether the teacher attended an economic education workshop, and the size of the school.

Table 5: Cross-Tabulations and Chi-Square Tests of Independence													
		PIMCRO			PMACRO			PINTER			PPERF		
Variables		Does Not MeetStandards	Meets or Exceeds Standards	Total	Does Not Meet Standards	Meets or Exceeds Standards	Total	Does Not Meet Standards	Meets or Exceeds Standards	Total	Does Not Meet Standards	Meets or Exceeds Standards	Total
Core 40	No	29	6	35	22	13	35	27	8	35	4	31	35
	Yes	51	14	65	24	41	65	47	18	65	21	44	65
	Total	80	20	100	46	54	100	74	26	100	25	75	100
χ^2 Statistics		.0275			6.16**			0.276			5.289**		
NCEE	No	50	11	61	31	30	61	47	14	61	14	47	61
	Yes	30	9	39	15	24	39	27	12	39	11	28	39
	Total	80	20	100	46	54	100	74	26	100	25	75	100
χ^2 Statistics		.0378			1.463			0.756			0.35		
JA	No	50	10	60	29	31	60	44	16	60	17	43	60
	Yes	30	10	40	17	23	40	30	10	30	8	32	40
	Total	80	20	100	46	54	100	74	26	100	25	75	100
χ^2 Statistic		1.042			0.329			0.035			0.889		
ICEE	No	39	9	48	23	25	48	37	11	48	8	40	48
	Yes	41	11	52	23	29	52	37	15	52	17	35	52
	Total	80	20	100	46	54	100	74	26	100	25	75	100
χ^2 Statistics		0.09			0.137			0.456			3.319*		
UNEC	<12hrs.	36	9	45	22	23	45	31	14	45	10	35	45
	≥12hrs	44	11	55	24	31	55	43	12	55	15	40	55
	Total	80	20	100	46	54	100	74	26	100	25	75	100
χ^2Statistics		0			0.275			1.111			0.337		

Table 5: Cross-Tabulations and Chi-Square Tests of Independence													
		PIMCRO			PMACRO			PINTER			PPERF		
Variables		Does Not MeetStandards	Meets or Exceeds Standards	Total	Does Not Meet Standards	Meets or Exceeds Standards	Total	Does Not Meet Standards	Meets or Exceeds Standards	Total	Does Not Meet Standards	Meets or Exceeds Standards	Total
NOTIME	No	53	9	62	26	36	62	45	17	62	15	47	62
	Yes	27	11	38	20	18	38	29	9	38	10	28	38
	Total	80	20	100	46	64	100	74	26	100	25	75	100
χ^2 Statistics		3.067*			1.085			0.171			0.057		
STMOT	No	56	12	68	33	35	68	49	19	68	17	51	68
	Yes	24	8	32	13	19	32	25	7	32	8	24	32
	Total	80	20	100	46	54	100	74	26	100	25	75	100
GENDER	Female	20	5	25	11	14	25	25	5	25	7	18	25
	Male	60	15	75	35	40	75	54	21	75	18	57	75
	Total	80	20	100	46	54	100	74	26	100	25	75	100
χ^2 Statistics		0			0.054			0.642			0.160		
TEXP	≤15 yrs	28	8	36	20	16	36	26	10	36	9	27	36
	>15 yrs	52	12	64	26	38	64	48	16	64	16	48	64
	Total	80	20	100	46	54	100	74	16	100	25	75	100
PCTDV	<=50%	34	6	40	17	23	40	30	10	40	12	28	40
	>50%	46	14	60	29	31	60	44	16	60	13	47	60
	Total	80	20	100	46	54	100	74	26	100	25	75	100
χ^2 Statistics		1.042			0.329			0.035			0.889		

Table 5: Cross-Tabulations and Chi-Square Tests of Independence

Variables		PIMCRO			PMACRO			PINTER			PPERF		
		Does Not MeetStandards	Meets or Exceeds Standards	Total	Does Not Meet Standards	Meets or Exceeds Standards	Total	Does Not Meet Standards	Meets or Exceeds Standards	Total	Does Not Meet Standards	Meets or Exceeds Standards	Total
INSERV	No	29	6	35	16	19	35	28	7	35	6	29	35
	Yes	51	14	65	30	35	65	46	9	65	19	46	65
	Total	80	20	100	46	54	100	74	26	100	25	75	100
χ^2 Statistics		0.275			0.002			1.008			1.773		
SIZE	Small	18	3	21	11	10	21	17	4	21	3	18	21
	Mid-	27	5	32	16	16	32	22	10	32	5	27	32
	Large	17	6	23	8	15	23	17	6	23	9	14	23
	X-L	18	6	24	11	13	24	18	6	24	8	16	24
	Total	80	20	100	46	54	100	74	24	100	25	75	100
χ^2 Statistics		1.719			1.716			0.999			6.124		

* indicates statistical significance at the 10% level

** indicates statistical significance at the 5% level

We do, however, find a number of factors that significantly influence whether a teacher fails to meet the standards. First, respondents who do not teach a Core 40 course are more likely to exceed the personal finance standard and less likely to meet or exceed the macro standard than those who do teach a Core 40 course. Additionally, teachers who do not use materials sponsored by the Indiana Council on Economic Education are more likely to spend too much time on personal finance topics. Perhaps more importantly, teachers who indicated that time is not a major factor in covering all of the standards are more likely *not* to meet those standards. The implications of the latter is that the breadth and depth of content teachers are expected to cover under the standards is not a significant determinant

of whether those standards are met. That is, the standards do not appear to be taxing in terms of the amount of time necessary to meet them. It remains to be seen from more detailed analysis whether this preliminary finding is upheld.

Table 6 contains the results from a series of nonparametric ANOVA (Mann-Whitney) tests for the GAP variable. Unlike the cross-tabulations that examined compliance for each of the core competency areas individually, the Mann-Whitney test indicated whether certain factors jointly influence compliance with the standards. The tests indicate that two of the factors outlined in Table 5 significantly influence joint compliance. Specifically, teachers administering a Core 40 course exhibit less deviation from the standards than those not teaching such a course, and those teachers who use National Council on Economic Education materials exhibit less deviation from the standards than those who do not use such materials. The first of these results upholds the findings from our cross-tabulation analysis, while the latter is a new result arising from aggregating compliance (or a lack thereof) across all four areas.

Table 6: Mann-Whitney Tests

Dependent Variable: GAP				
Decomposed by:	n	Mean	Std. Deviation	Test Statistics
CORE 40				
No	35	0.435	0.274	-2.464**
Yes	65	0.283	0.134	
NCEE				
No	61	0.379	0.229	-2.226**
Yes	39	0.271	0.146	
JA				
No	60	0.331	0.209	-0.654
Yes	40	0.344	0.206	
ICEE				
No	48	0.345	0.175	-0.866
Yes	52	0.323	0.233	
UNEC				
<=9 hrs	45	0.371	0.262	-0.391

Table 6: Mann-Whitney Tests				
Dependent Variable: GAP				
Decomposed by:	n	Mean	Std. Deviation	Test Statistics
> 9 hrs	55	0.308	0.144	
NOTIME				
No	62	0.357	0.236	-0.586
Yes	38	0.303	0.145	
INTEREST				
No	68	0.350	0.207	-1.526
Yes	32	0.307	0.206	
GENDER				
Female	25	0.361	0.237	-0.354
Male	75	0.328	0.196	
TEXP				
<= 15 yrs	36	0.338	0.208	-0.417
> 15 yrs	64	0.336	0.208	

The regression results are reported in Tables 7 and 8. We begin by examining the chi-square tests for model significance. Clearly, we fail to reject the null hypothesis (that controlling for the exogenous characteristics provides no additional information than the simple descriptive statistics) with 95 percent confidence for every equation in Tables 7 and 8. Thus, we conclude that our simple hypothesis tests from Table 4 are robust, even when controlling for these variables jointly. In other words, when taken in tandem, none of the exogenous characteristics are significant determinants of compliance with the state standards. Given the sparse number of significant coefficient estimates, this result is not surprising. However, it is interesting (merely as an exercise) to note that the few significant coefficient estimates do coincide with some of our previous findings. For example, teachers administering a Core 40 course are more likely to meet or exceed the macroeconomics standards and are also less likely to have extreme GAP values (indicating divergence from the standards taken jointly).

Table 7: Logit Regression Results

Dependent Variable	PMICRO		PMACRO		PINTER		PPERF	
	Dummy Variable		Dummy Variable		Dummy Variable		Dummy Variable	
Variable	Estimated Coefficient	T-Stat	Estimated Coefficient	T-Stat	Estimated Coefficient	T-Stat	Estimated Coefficient	T-Stat
Constant	-4.532	-2.866**	-1.166	-1.136	-2.010	-1.768*	-1.474	-2.203**
CORE 40	0.459	0.718	1.415	2.720**	0.114	0.210	0.663	1.099
NCEE	-0.165	-0.246	0.405	0.753	0.664	1.154	0.537	0.969
JA	0.493	0.843	0.732	1.449	-0.181	-0.343	-1.131	-1.178
ICEE	-0.072	-0.076	0.150	0.195	-0.495	-0.600	-0.032	-0.728
UNEC	-0.023	-0.480	-0.008	-0.219	-0.003	-.0.089	-0.574	-0.912
NOTIME	1.733	2.170	-0.628	-1.135	-0.726	-1.237	-0.699	-1.060
STMOT	1.664	1.991**	0.673	1.117	-0.892	-1.391	0.355	0.553
GENDER	-0.190	-0.271	-0.598	-1.016	0.522	0.810	0.002	0.087
TEXP	0.039	1.340	0.050	2.232**	0.020	0.907	1.289	1.250
PCTDV	0.892	0.857	-0.680	-0.817	0.728	0.794	0.083	0.085
INSERV	-0.275	-0.303	-0.481	-0.655	0.820	1.014	0.048	0.055
SMALL	0.083	0.094	0.268	0.416	-0.652	-0.881	-0.797	-1.051
LARGE	0.959	1.205	0.612	0.911	-0.397	-0.561	-0.727	-0.953
EXTRA-LARGE	0.924	1.179	0.017	0.026	-0.521	-0.745		
Unrestricted Log-Likelihood				-43.676	-59.535	-53.694	-47.766	
Restricted Log-Likelihood				-50.040	-68.994	-57.306	-56.234	
Chi-Square Statistic (14 degree of Freedom)				12.73	18.92	7.22	16.94	
Number of Observations				100	100	100	100	

* indicates statistical significance at the 10% level

** indicates statistical significance at the 5% level

Table 8 Logit Regression Results

	GAP Ranking Ordered		GAP Bottom Q Dummy Variable		GAP Second Q Dummy Variable		GAP Third Q Dummy Variable		GAP Top Q Dummy Variable	
	Estimated Coefficient	T-Stat.	Estimated Coefficient	T-Stat.	Estimated Coefficient	T-Stat.	Estimated Coefficient	T-Stat.	Estimated Coefficient	T-Stat.
Constant	2.837	2.927**	-2.913	-2.198**	-1.415	-1.185	-1.576	-1.392	0.840	0.709
CORE 40	-0.762	-1.814*	0.301	0.514	0.657	1.148	0.509	0.877	-1.343	-2.371**
NCEE	-0.230	-0.491	-0.221	-0.364	0.477	0.763	0.398	0.669	-0.933	-1.404
JA	0.467	1.045	-0.544	-0.954	-0.026	-0.047	0.015	0.027	0.544	0.929
ICEE	-0.450	-0.662	0.521	0.573	0.370	0.418	-0.917	-1.076	-0.193	-0.203
UNEC	0.009	0.267	-0.051	-1.080	0.040	0.980	0.005	0.123	-0.011	-0.253
NOTIME	-0.810	-1.661*	0.496	0.758	0.420	0.682	-0.022	-0.038	-0.921	-1.453
STMOT	-1.388	-2.875**	1.083	1.666*	0.761	1.190	-0.546	-0.816	-1.482	-1.968**
GENDER	0.145	0.298	-0.076	-0.119	0.530	0.770	-0.313	-0.497	0.026	0.041
TEXP	-0.009	-0.433	0.004	0.181	-0.020	-0.845	0.034	1.422	-0.026	-1.039
PCTDV	-0.326	-0.434	0.797	0.831	-0.811	-0.873	0.377	0.365	-0.277	-0.285
INSERV	0.309	0.462	-0.260	-0.292	-0.121	-0.144	0.195	0.249	0.433	0.483
SMALL	0.212	0.333	0.920	1.054	-0.983	-1.326	-0.460	-0.654	0.755	1.015
LARGE	-0.637	-0.982	1.951	2.373**	-1.579	2.0733**	-0.239	-0.338	0.089	0.107
EXTRA LARGE	-0.511	0.841	1.940	2.343**	-1.229	-1.664*	-0.763	-1.012	0.427	0.562
Unrestricted Log-Likelihood		-129.267		-48.467		-51.029		-52.754		-47.012
Restricted Log-Likelihood		-138.629		-56.234		-56.234		-56.234		-56.234
Chi-Square Statistic (14 dof)		18.73		15.53		10.41		6.96		18.44
Number of Observations			100							

* indicates statistical significance at the 10% level ** indicates statistical significance at the 5% level

The regression also indicates that teachers working in larger schools are more likely to adhere to the State standards (as evidenced by the logit regression for the GAP, first and second quartile dummy variables). Greater teacher experience also has a positive impact on whether the macroeconomics standard is met. Perhaps most intriguing is the finding that teachers reporting that student motivation is a major challenge are more likely to adhere closely to the standards, both overall (as evidenced by the GAP regressions) and to the microeconomics standard individually.

CONCLUSION

From a policy perspective, our findings present a surprisingly optimistic picture about the response of high school teachers to the adoption of state economic standards. We find that while virtually all teachers in our sample deviate from the standards, the magnitude of the deviation is small and occurs in a predictable way. Most teachers appear to spend slightly less time on microeconomics (43.2% versus the mandated 50%) and international economics concepts (9.1% versus the mandated 12%) in favor of additional personal finance (19% versus 10%). Moreover, our regression analysis indicates that this finding is robust to many exogenous factors that are purported to influence a teacher's decisions over course content. As a result, the standards appear to be moderately successful in achieving its intended goal of creating convergence in content coverage in high school economics curricula.

Successfully aligning economics instruction with state standards is dependent upon altered teacher behavior. The findings of this paper suggest that there may be interventions that can lead to altered behavior by teachers. The lack of significance of demographic factors suggests that these interventions may be workable under various demographic profiles of teachers of economics courses. A key focus of these interventions would be to build awareness of standards coverage through curriculum planning as well as through the activities such as the NCEE, upon which the Indiana standards are based. It may also be useful for educators to be aware of the extent to which standards have been adequately implemented in the classroom, prior to the proposed economics assessment of high school students (such as the 2006 National Assessment of Educational Progress (NAEP) Economics Assessment.

Given our findings that teachers behave in a predictable fashion, changing the standards themselves may be another viable way to achieve the goal. For

example, if policy makers want exactly 50% course content in microeconomics, they may actually want to increase the microeconomics standard (for example, to 56%) and reduce the personal finance standard (to say, 8%) knowing that teachers will deviate from the standard, but only marginally so. Future work that empirically estimated the magnitude of this tradeoff (between personal finance and microeconomics/international economics) would provide valuable information about the effectiveness of such a policy.

The underlying motivation for this paper comes from the hypothesis that deviations between actual content coverage and state mandates may contribute to a lack of economic literacy in high school students. The results of our analysis do not support this claim, as teachers appear to be (for the most part) adhering to the standards. However, the aggregate nature of our data does not allow us to answer the question definitively. Instead, it provides direction for future research. If teachers are spending the correct proportion (or something close to the correct proportion) of time on each content area, the determinants of economic literacy should focus not on *what* is being taught, but *how* it is being taught. Additionally, while teachers may be spending an appropriate amount of time on each content area, the allocation of time spent on individual topics within each area may not be appropriate to ensure that students grasp the major concepts central to economic literacy. As such, future research is necessary to identify the allocation of time spent on individual concepts. This allows policy makers to subsequently create standards at the level of the concept, and not the subject area, which enhance economic literacy.

ENDNOTES

[1] Within Indiana's Economic standards, the following standards and benchmarks can be associated with personal finance issues. Standard 1, "Scarcity and Economic Reasoning", two benchmarks can be identified as those dealing with personal finance: (1) "Formulate a savings or financial investment plan for a future goal" and (2) "Predict how interest rates will act as an incentive for borrowers and savers." In Standard 2, the "Supply and Demand" benchmark deal with personal finance reads, "Explain how financial markets, such as the stock market, channel funds from savers to investors." In Standard 4, "Role of Government", the personal finance benchmark statement reads, "Identify taxes paid by students." In Standard 5, "National Economic Performance", the personal finance benchmark statement

reads, "Analyze the impact of inflation of students' economic decisions." Standard 6, "Money and the Role of Financial Institutions", identifies four benchmarks that deal with personal finance: (1) "Explain the role of banks and other financial institutions in the economy of the United States", (2) "Compare and contrast credit, savings, and investment services available to the consumer from financial institutions", (3) "Research and monitor financial investments, such as stocks, bonds, and mutual funds", and (4) "Formulate a credit plan for purchasing a major item comparing different interest rates." Standard 7, "Economic Stabilization" has a benchmark that reads, "Articulate how a change in monetary or fiscal policy can impact a student's purchasing decisions."

[2] As the results in Table 4 show, only one reported value is exactly equal to the state standards. As such, including the observations who exactly meet the standards with those who exceed the standards (as opposed to including them with those who do not meet the standards) causes little loss of generality. Also, we chose to use cross-tabulations (as opposed to an approach such as the Mann-Whitney test) because we believe that it expresses the same information, yet it is also more consistent with the coming regression analysis.

[3] Because our survey does not provide data to control for all important determinants of compliance, our results may suffer from omitted variable bias. As such, our intent in Table 7 and 8 is simply to perform an exploratory analysis with the data at our disposal.

[4] The Mann-Whitney test employed to analyze the GAP variable prior to the regression analysis essentially operated by ranking the data and comparing rakings across the treatment variable(s). As such, our decision to categorize the GAP variable by quartiles is consistent with our previous analysis

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