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ABSTRACT

Part of a series which offers educational resources and teaching techniques related to major social issues to high school social studies teachers, the booklet describes and reproduces a test measuring students' economic literacy. Part I is the test manual, which explains the objectives, value, development, and two-form structure of the test. It uses a content-cognitive schema which covers seven content categories (basic economic problems, economic systems, microeconomics, macroeconomics, world economy, economic institutions, and evaluation concepts), and two cognitive-level categorizations: one measuring student learning levels in terms of knowledge, comprehension, application, analysis, and evaluation; the other in terms of recognition-understanding, simple application, and complex application. The booklet presents five suggestions for use of the test, instructions for how to administer and score it, and details technical data such as standardization and norms, norm tables, item analysis, reliability, validity, correlation with general ability, and additional descriptive statistics. Part II consists of an explanation of the 72 questions in Form A and Form B. Each question and its four possible answers are reproduced, with the correct answer appearing in bold type. Other items include a rationale for each answer, and numbers recording the percentage of the norm with the correct answer (with and without economics background) and the discrimination coefficient. Appendices list the schools that participated in the test norming, handscoring keys, and an answer sheet. (CK)

TEST OF ECONOMIC LITERACY

Discussion Guide and Rationale

By John C. Soper

Joint Council on Economic Education

JCEE Checklist No. 270

ABOUT THE AUTHOR

John C. Soper, at the time of completion of the TEL project, was senior economist and acting director of programs for the Joint Council on leave from Northern Illinois University, where he is an associate professor of economics. During 1977-78 he served as interim executive director of the Illinois Council on Economic Education, and from 1972-78 he was the director of the Center for Economic Education at Northern Illinois University. He has also taught economics at the University of Missouri (Columbia), Central Michigan University, The University of Michigan, and the University of Massachusetts, Amherst. He has published widely in economics and economic education, and is a member of more than fifteen professional organizations. He received his Ph.D. in economics from the University of Massachusetts, Amherst, in 1970.

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Part I. TEST MANUAL

1. The Development of the Test

In 1961, the National Task Force on Economic Education released its report, *Economic Education in the Schools*, a detailed and objective outline of basic economic concepts for use in the nation's schools.[1]

Following the release of the Task Force report, a void was perceived in the library of economic education materials, namely, an appropriate instrument to measure the economic knowledge of high school students. As a result, the *Test of Economic Understanding* (TEU) was developed in 1964 through the efforts of the Joint Council on Economic Education.[2] The primary purpose of the TEU was to help school systems assess gains in economic knowledge by the use of a standardized, nationally normed instrument. The test served this function adequately for a number of years. In addition, the TEU became one of the first tools available to test economic knowledge in experimental settings. It thereby fostered the development of a substantial body of research in the field of economic education.

In 1977, the Joint Council on Economic Education released the first major update of the work of the National Task Force: the *Master Curriculum Guide for the Nation's Schools*, part I, *A Framework for Teaching Economics: Basic Concepts*.[3] This document was designed to specify an optimum base of economic knowledge for the typical high school graduate. The *Framework* is not an attempt to provide detailed guidelines on how to teach economics in school systems; it is, rather, designed to spell out the basic structure of the discipline of economics in a relatively brief compass. Part II of the Master Curriculum Guide (MCG) project is a five-volume series of grade-specific strategies to carry out economic education in the schools.[4]

Concurrent with the Master Curriculum Guide project, the Joint Council on Economic Education moved ahead with the development of a substantive revision of the outdated *Test of Economic Understanding*, which culminated in the present publication, the *Test of Economic Literacy* (TEL). This two-form test provides school systems with an updated evaluation instrument and researchers with an updated set of tests for use in experimental settings.

The TEL project began in the spring of 1976 with the formation of a National Advisory Committee.[5] A working committee, composed of economic educators, economists, and high school teachers, was also

1. *Economic Education in the Schools: a Report of the National Task Force on Economic Education, September, 1961* (New York: Committee for Economic Development, 1961).
2. *Test of Economic Understanding* (Chicago: Science Research Associates, Inc., 1964).
3. New York: Joint Council on Economic Education, 1977.
4. *Strategies for Teaching Economics: Primary Level (Grades 1–3); Intermediate Level (Grades 4–6); Basic Business and Consumer Education; U.S. History;* and *World Studies*. The first two have been published and the last three, for the secondary level, are forthcoming in 1979.
5. The National Advisory Committee consisted of the following individuals.
   G. L. Bach, Stanford University
   William E. Becker Jr., University of Minnesota
   James D. Calderwood, University of Southern California
   George G. Dawson, Empire State College–State University of New York
   W. Lee Hansen, University of Wisconsin-Madison
   Robert V. Horton, Purdue University
   Darrell R. Lewis, University of Minnesota
   Clayton Millington, Oklahoma State University
   Donald W. Paden, University of Illinois
   Phillip Saunders, Indiana University
   S. Stowell Symmes, Joint Council on Economic Education
   Arthur L. Welsh, Joint Council on Economic Education

formed.[6] The working committee first analyzed the old *Test of Economic Understanding* to specify what it contained in terms of economic concepts as well as the cognitive levels of the test items. This analysis facilitated the subsequent development of a new matrix for the TEL in which each question was categorized by content level (according to the Master Curriculum Guide *Framework*) and a set of cognitive levels (corresponding to a modification of Bloom's taxonomy).[7] This content-cognitive schema is discussed in Section 2, below. The analysis of the TEU also indicated that a large number of questions could be used in the new instruments with little or no change. In addition, the new matrix for the TEL also pointed up a number of areas in which questions would have to be either drawn from other testing instruments or constructed anew.

In the summer of 1976, the TEL Working Committee assembled to write new questions for the TEL and to flesh out the particulars of the test matrix in line with a set of guidelines provided by members of the National Advisory Committee for the TEL. The exact content weights—in terms of economic concepts—were determined after close consultation with W. Lee Hansen, chairman of the Framework Committee of the Master Curriculum Guide project. Trial administrations of the first version of the TEL were conducted in a series of teacher-training workshops at Northern Illinois University in the late summer of 1976. At roughly the same time, the first version of the TEL was administered to several classes then studying the principles of economics at NIU. Based on these first trials of the test, a number of revisions were introduced in order to remove what were statistically identified as poor questions by the outcome of an item analysis of the test results.

A second version of the TEL was pretested by the working committee in several large high school districts in Illinois. Again, based on the statistical analysis of this trial administration, a number of revisions were introduced to "clean up" poor items. Two more trial versions of the test were constructed during the fall semester of 1976, each one leading to marginal improvements in the discrimination power of individual test items and the overall reliability of the test instruments. By January 1977, the test was ready for final checking by the National Advisory Committee, and based on the reactions of this committee, a fifth and final two-form (46 questions each) version was prepared for norming purposes.

Norming activities were carried on in the spring of 1977, using a large cross section of the nation's high schools selected on the basis of a stratified random sample. A listing of the schools that participated in the national norming is contained in Appendix A. The results of that norming are contained in Section 6, below.

The primary value of the TEL should lie in its ability to help assess student understanding of the basic economic concepts that it is essential for them to know to effectively fill their present and future roles as consumers, workers, and voters. If the test is administered before and after a course of economics instruction, the test should be a useful aid in the evaluation of curriculum content and teaching methods. For pre- and post-testing purposes, two equivalent forms of the TEL are available, A and B, having 46 items each. When the period of economics instruction is shorter than a quarter or semester, pre- and post-testing should be conducted using alternate forms to preclude distortions in results because students "remember" the pretest at the time of the second testing.

2. The Structure of the Test

The economic content of the *Test of Economic Literacy* is based upon the Master Curriculum Guide *Framework*. The test questions are broken down into seven distinct content categories:

A. The basic economic problem
B. Economic systems
C. Microeconomics: resource allocation and income distribution
D. Macroeconomics: economic stability and growth
E. The world economy
F. Economic institutions
G. Concepts for evaluating economic actions and policies

6. The TEL Working Committee consisted of the following individuals:
William C. Braman, economics teacher, Lake Forest High School, District 115, Lake Forest, Illinois
William Carlson, economics teacher, Rockford Charter School District 205, Rockford, Illinois
Michael A. MacDowell, former executive director, Illinois Council on Economic Education, DeKalb, Illinois; now president of the JCEE.
John S. Morton, economics and political science teacher, Homewood-Flossmoor High School District 233, Flossmoor, Illinois
Peter R. Senn, professor of economics and social science, Chicago City College (Wright Campus), Chicago, Illinois
John C. Soper, associate professor of economics, Northern Illinois University, DeKalb, Illinois
In addition, the TEL working committee had the benefit of special assistance from W. Lee Hansen, Arthur L. Welsh, and Darrell R. Lewis in the preparation of draft test instruments.

7. Benjamin S. Bloom, ed., *Taxonomy of Educational Objectives, The Classification of Educational Goals, Handbook 1: Cognitive Domain* (New York: McKay, 1956).

In addition, a number of questions on the TEL involve one or more of the seven "statistical concepts" listed in the MCG *Framework*. However, these questions also test knowledge of the "content categories" listed above. In general, each question involving a "statistical concept" has at least one corresponding question testing the same "content category" without the "statistical concepts." Thus, the teacher should be able to determine if the student has trouble with the "math" or the "economics" by comparison scoring of the appropriate questions. Table 1 lists the detailed content categories for the TEL.

The TEL is also broken down according to a five-level schema of cognitive taxonomy. This set of cognitive levels is a variant of Bloom's taxonomy. In Bloom's original work, six taxonomic levels or categories were identified: knowledge, comprehension, application, analysis, synthesis, and evaluation. In the TEL cognitive taxonomy, Bloom's synthesis level has been omitted, on the presumption that little or no synthesis is called for in the typical high school course or unit on economics. The working committee felt that the remaining five levels provide an adequate breakdown of the learning levels that could and should be broached in the typical high school economics course or unit. Table 2 displays this five-level cognitive taxonomy for the TEL.

The overall specifications of the TEL are contained in Table 3, a matrix that breaks down each item of each form of the test by content and cognitive categories. Table 4 contains a summary TEL matrix, categorizing the test according to both cognitive levels as determined by the TEL five-level categories and the three-level breakdown used to categorize questions on the *Test of Understanding in College Economics* (TUCE).[8] The TUCE cognitive categories were identified as (1) recognition-understanding, (2) simple application, and (3) complex application.[9] Those familiar with the TUCE categories will note the lack of overlap between the two cognitive-level categorizations.

The classification of a particular test item according to a single economic content category or a clear-cut cognitive level (either based upon the modified Bloom taxonomy or TUCE level) is often somewhat arbitrary. Thus, any individual surveying the test matrix might well disagree with the determination of the working committee for any given item. However, it was the judgment of the working committee that the content and cognitive levels finally adopted best reflected the actual structure of the TEL. With regard to the economic content tested by the two forms of the TEL, Table 4 indicates the working committee's interpretation of the National Advisory Committee's guidelines as to what *ought* to be tested. In other words, the optimal content weights for the TEL were determined

TABLE 1: Content Categories for the TEL

A. The Basic Economic Problem

1 Economic wants
2 Productive resources
3 Scarcity and choices
4 Opportunity costs and trade-offs
5 Marginalism and equilibrium

B. Economic Systems

6 Nature and types of economic systems
7 Economic incentives
8 Specialization, comparative advantage, and the division of labor
9 Voluntary exchange
10 Interdependence
11 Government intervention and regulation

C. Microeconomics: Resource Allocation and Income Distribution

12 Markets, supply and demand
13 The price mechanism
14 Competition and market structure
15 "Market failures": information costs, resource immobility, externalities, etc.
16 Income distribution and government redistribution

D. Macroeconomics: Economic Stability and Growth

17 Aggregate supply and productive capacity
18 Aggregate demand: unemployment and inflation
19 Real and money income; price level changes
20 Money and monetary policy
21 Fiscal policy: taxes, expenditures, and transfers
22 Economic growth
23 Saving, investment, and productivity

E. The World Economy

24 International economics

F. Economic Institutions

G. Concepts for Evaluating Economic Actions and Policies

Economic goals: freedom, economic efficiency, equity, security, price stability, full employment, and growth
Trade-offs among goals

8. *Test of Understanding in College Economics* (New York: The Psychological Corporation, 1968).
9. "Recognition-understanding" (RU) questions are those that could, in principle, be answered by reference to a textbook. Such questions need not be answerable by rote memory, but can and should test understanding or comprehension rather than simple recall. A "simple application" (SA) question involves the application of a principle or concept when its use is specified or clearly implied. A "complex application" (CA) question requires that the student demonstrate ability to *select* and *utilize* a concept or principle when its use is not specified. A CA question may also be one in which two or more concepts or principles must be related in some manner not previously presented to the students.

TABLE 2: Five-Level Cognitive Taxonomy for the *Test of Economic Literacy*

Level	Objective	Operative Verbs	Emphasis
I Knowledge	To show that the student knows	list, recall, remember, tell, define, identify, label, locate, recognize	recognition and recall—ability to remember facts in a form close to the way they were first presented
II Comprehension	To show that the student understands	explain, illustrate, describe, summarize, interpret, expand, convert, measure, understand, translate, extrapolate	grasp the meaning and intent of information—ability to tell or translate in own words
III Application	To show that the student can use what is learned	demonstrate, apply, use, construct, find solutions, collect information, perform, solve, use abstractions, choose appropriate procedures	use of information—ability to apply learning to new situations and real-life circumstances
IV Analysis	To show that the student perceives and can pick out the most important points in material presented	analyze, debate, differentiate, generalize, conclude, distinguish, organize, determine	reasoning—ability to break down information into component parts and to detect relationships of one part to another and to the whole
V[a] Evaluation	To show that the student can judge and evaluate ideas, information, solutions, procedures, and goals	compare, decide, judge, evaluate, conclude, contrast, appraise, develop criteria	criteria or standards for evaluation and judgment—ability to make judgments based on criteria or standards

SOURCE: Adapted from Sally R. Campbell, *Consumer Education in an Age of Adaptation* (Chicago: Sears, Roebuck, 1971), p. 10.

[a]This is actually the *sixth* level of Bloom's original taxonomy. We decided to delete the *fifth* level ("Synthesis") from the original schema, as it does not appear to fit in with what is normally taught in the economics classroom. In Bloom's formulation, the emphasis in the "synthesis" category is on originality and creativity.

TABLE 3: Overall Specifications for the TEL

Content Categories	Form A							Form B						
	Cognitive Categories					No. of Questions	Per Cent	Cognitive Categories					No. of Questions	Per Cent
	I	II	III	IV	V			I	II	III	IV	V		
A	1													
	2	1												
	3	2							1					
	4		3						2	3				
	5		19			4	8.7			4			4	8.7
B	6	4	6											
	7	5						5						
	8		7						7					
	9		8							9				
	10							6	8					
	11		9			6	13.0					10	6	13.0
C	12		11	14,15				11		15,16,17				
	13			16,17	22				12	18	20			
	14		12	20,21						14,19				
	15		13			23,24					22	23		
	16	10			18		14	30.4		13			21	13	28.3
D	17		33						33					
	18	25			38,39				34		29,39,40			
	19	26,30			27,28	42			24,25,26	37	28			
	20	31,32	34						27,31	35				
	21			37	40,41			37.0	32		38			
	22		35								41			
	23		36			17				36			17	37.0
E	24		43			1	2.2				42		1	2.2
F		44,46				2	4.3	43,44					2	4.3
G					29,45	2	4.3		45			30,46	3	6.5
Total number of questions		10	12	11	5	46	100.0	11	11	11	8	5	46	100.0
Per cent		21.7	26.1	23.9	17.4	10.9	100		23.9	23.9	23.9	17.4	10.9	100	

NOTE: The entries in the matrix cells are the question numbers in the TEL. The "cognitive category" numbers above the vertical columns correspond to those in Table 2; the "content category" letters and numbers at the left correspond to those in Table 1.

TABLE 4: Summary Content/Cognitive Level Matrix for the TEL (number of questions)

Content Category	Cognitive Level I	II	III	IV	V	Total	TUCE Level RU	SA	CA
Form A									
A	0	2	2	0	0	4	2	2	0
B	2	2	2	0	0	6	4	2	0
C	1	3	6	2	2	14	6	8	0
D	5	4	1	6	1	17	14	3	0
E	0	1	0	0	0	1	1	0	0
F	2	0	0	0	0	2	2	0	0
G	0	0	0	0	2	2	0	0	2
Total	10	12	11	8	5	46	29	15	2
Form B									
A	0	2	2	0	0	4	2	2	0
B	2	2	1	0	1	6	5	1	0
C	1	2	6	2	2	13	6	7	0
D	6	4	2	5	0	17	14	3	0
E	0	0	0	1	0	1	1	0	0
F	2	0	0	0	0	2	2	0	0
G	0	1	0	0	2	3	1	0	2
Total	11	11	11	8	5	46	31	13	2

on the basis of consultation with members of the National Advisory Committee (in particular with W. Lee Hansen). The extent to which the working committee was able to find or to write test items that adequately reflected this optimal test structure is a completely different question, and is, of course, open to critical comment by reviewers and users of the test instruments.

3. Use of the Test

To Measure Student Knowledge

The *Test of Economic Literacy* was designed primarily to aid teachers in evaluating and improving the quality of high school economics teaching. There are several ways in which it can be used to achieve that objective.

• In Pretests

The TEL can be administered as a pretest at the outset of a unit of instruction or at the beginning of a semester to assess the students' prior knowledge of economic concepts. This is becoming more and more important to high school teachers because many school systems have inserted instruction in economics—sometimes only on a limited basis—well below the high school grades. If pre-high-school economics instruction has been effective, many students will already have acquired some knowledge of economic ideas. Thus, the wise high school teacher will want to know the students' areas of strength and weakness, so that the teacher can balance the course's content appropriately.

To determine areas of students' relative strength or weakness in economic knowledge, teachers can compare the scores of their students with the national scores for each test item. The relevant national scores for comparison with pretests are those listed in the Discussion Guide in Part II for students "without economics." Small differences between scores reported for a given question in this manual and those obtained in the classroom should not be emphasized. However, certain kinds of comparisons may prove useful. For instance, if the average score of students on the test as a whole is as good or better than the national scores, significantly lower scores on selected items may indicate areas of economics the teacher may wish to emphasize in subsequent teaching. The Discussion Guide provides a brief rationale for each question, and teachers might want to examine those before deciding whether the particular concept tested deserves greater attention in the classroom. If still in doubt, the teacher should refer to the relevant pages of the MCG *Framework*.

In addition to comparing pretest scores by item, teachers can group their students' responses by the content and/or cognitive categories discussed in Section 2, above. This will enable the teacher to compare scores in several different areas of economic content or levels of cognition. For example, the scores of students in a given class can be compared with national scores in content categories such as economic systems or macroeconomics or in cognitive categories such as application or analysis. Students' incorrect responses often tend to cluster about specific topics; the identification of such topics may lead teachers to give them greater emphasis and to develop strategies for teaching them more effectively. However, whether a comparison is made on the basis of individual items or content/cognitive groupings, the TEL can be used to identify areas in which students have strengths and weaknesses even before formal teaching begins so that the teacher can make appropriate adjustments in the time and emphasis given to various economic topics.

• In Post-tests

The TEL can also be used at the end of a semester or unit of instruction in order to measure the extent to which understanding has improved. Post-test scores for a given group of students may be compared to their pretest scores and to the national scores for students "with economics" in the Discussion Guide (Part II). A pretest/post-test use of the TEL should help to provide evidence of the effect of a given curriculum and teaching strategy on students' economic literacy. This will be a particularly useful tool of comparison if the test is administered on both a pre- and post-test basis to classes in a school system in which varying degrees of emphasis are placed on economics and different teaching approaches employed. It is hoped that the TEL will be used that way to measure the impact of varying teaching treatments on student performance in economics. Rigorous evaluations of this kind should contribute significantly to the improvement of teaching effectiveness in high schools.

When used as a post-test, the TEL should be administered early enough to allow one or two class periods to be used for discussion of test scores, individual test items, and topic areas. The teacher can take advantage of the students' natural interest in their relative standing in the class and in relation to the national norming sample of students who have had previous training in economics.

To help compare item responses of a given group of students with those of the norming sample, the Discussion Guide, below, lists each question and the possible responses, with the correct response printed in bold face. Also included for each item, in columns to the right of the item rationales, are the percentage of the norming sample of students with economics and without economics whose answers were correct and an item discrimination coefficient.[10] The coefficient indicates the ability of a given question to discriminate between those students who "know economics" and those who do not. It is more an evaluation of the individual item than it is of the individual student. The *higher* the coefficient (i.e., the closer it is to +1.0), the better the item. The *lower* the coefficient (i.e., the closer it is to −1.0), the worse the item. An item discrimination coefficient of zero would indicate a question that completely fails to discriminate between "strong" and "weak" students. In general, an item discrimination coefficient below 0.20 is a "poor discriminator." Questions with a *negative* coefficient are *reverse discriminators* (indicating that more "weak" students get the question right than do "strong" students). Teachers should also be aware that the item discrimination coefficient does *not* adjust for the reading level or general ability of individual students in the norming sample. Thus, relatively "bright" students may do well on a given question regardless of whether or not they have had economics instruction.

There are other reasons for using the item discrimination information with care. Item difficulty (percentage of correct responses) depends upon many things besides the complexity of the fact, concept, or principle being tested. Such matters as classroom emphasis on the specific point in question, the closeness or plausibility of incorrect alternatives or "distractors," and the relation of the item content to students' outside activities, experiences, and reading and TV-viewing habits may also affect item difficulty. Therefore, it is worth stressing again that undue emphasis should not be placed on small differences between the percentage reported in this manual and those obtained in the classroom.

When students cannot answer a question or find it most difficult to select the correct answer, they are generally very interested in what the correct answer is and why it is correct. Students' incorrect responses often tend to be concentrated on specific topics. It is on those topics that review time can be spent most profitably since the clustering of errors is an indication of confusion about the topic. Depending upon the class, the teachers may wish to read the rationale for each correct answer directly from the Discussion Guide or simply use it as a basis for their own remarks. Discussion can then continue between students and teacher, using the class's textbook as well as supplementary materials for background information. In this way, the TEL can become a powerful teaching tool.

• During a Course

A third use of the TEL is to administer one of its forms midway during a course or unit of instruction and to use the results for *formative* evaluation purposes. Data on student performance near the halfway point can then be used to alter instructional strategies for the balance of the course or unit, thereby more closely reaching the instructional goal: greater student economic literacy.

10. This is the point-biserial correlation between an individual test item, g, and the total test score, x. The formula for this correlation is

$$r_{xg} = [(\bar{x}_g - \bar{x})/S_x] \sqrt{(P_g/Q_g)}$$

where $\bar{x}_g$ = mean score of those answering item g correctly
$\bar{x}$ = mean score on the total test
S_x = standard deviation on the total test
P_g = proportion answering item g correctly
$Q_g = (1 - P_g)$

As a further reference, see Harold Gulliksen, *The Theory of Mental Tests* (New York: Wiley, 1950), p. 426.

When used on a pretest, midterm, and post-test basis, it is likely that some student "learning" will result because students will then take one form of the test twice. In other words, students may "remember" items from one test administration to the next. This effect can be reduced substantially, if not completely, by alternating forms of the test. However, if an entire quarter or semester intervenes between administrations, the same form of the TEL may be given without concern for major "incidental learning" effects through the testing process itself.

Learning Economics through Group Testing

Standard testing practices tend to be competitive situations for students, pitting one student against another, the entire class, or the national norms. Some students may find this situation threatening or intimidating. As an alternative, teachers may wish to employ the group-testing method developed by Peter R. Senn of the Chicago City Colleges, Wright Campus.

In Senn's method, students are encouraged to form small groups of five to eight students each and to work cooperatively on individual test items. Each student has an individual answer sheet on which to record his or her individual response, but the group as a whole must come up with a "group answer" to each question (from which individual student answers may differ). Members of each group are encouraged to discuss each question and its selection of answers and to develop reasons for the choice of "correct" responses. When all groups have completed the test, a class discussion of every question follows. For each question, a different group is called upon to give the "correct" answer and the group's rationale for its choice. Class discussion can then follow, particularly if a group's response is incorrect.

Senn's group-testing method places emphasis on cooperation rather than competition and engenders a nonthreatening, nonintimidating class spirit. It also leads to group learning, which may be far more effective than more traditional approaches. However, the group-testing method obviously reduces the accuracy of measurement of individual student achievement or performance as customarily measured.

Chance Results

Each question on the TEL has four possible choices, one correct answer and three distractors. Pure chance would thus dictate an aggregate correct score of 25 percent (11.5 points on the TEL) for those who had absolutely no knowledge of economics. If some students score below 25 percent on the test, their answer sheets in particular should be carefully checked for systematic errors in test marking, scoring, or test administration. For instance, the key for Form A might have been used inadvertently to score a Form B test.

It should also be noted that the norming data yielded several questions with "below chance" scores for the norming sample. These results indicate particularly difficult items which *may* be faulty in some technical way. In evaluating answers to such items, allowance should be made for the "quality" of the question. Subsequent work on the TEL may lead to modification of individual test items or "improvement" in item statistics through the elimination or reduction of measurement error. In any event, pretest results for an entire class should equal or exceed the chance score of 11.5.

Use in Various Courses

It should also be stressed that the *Test of Economic Literacy* was not designed for exclusive use in high school economics courses. Teachers of social studies, business education, consumer education, history, home economics, and other subjects may find the TEL useful, particularly if the courses include significant amounts of economics. Moreover, community college economics instructors may find the TEL useful in evaluating student achievement in basic economics courses. Finally, preservice and in-service teacher trainers may find the test worthwhile for college-level instruction of teachers in courses and workshops. In fact, *any* course, workshop, or unit of instruction based on the MCG *Framework* and intended for the high school level and above can be evaluated effectively by means of the TEL. If the MCG *Framework* is not the focus of instruction in a particular teaching situation, the TEL may or may not be an appropriate evaluation instrument; the teacher must decide on an individual basis.

Use in Research

The *Test of Economic Understanding*, which was published in the 1960s and was the predecessor of the TEL, led to a surge of evaluative studies and research on the teaching and learning of economic concepts in schools. It is hoped that the TEL will continue that trend. Researchers employing the TEL in experimental settings may wish to pay particular

attention to the technical data reported in Section 6, below. In addition, a JCEE report now being prepared will contain a number of useful observations for researchers and evaluators.[11]

4. Administering the Test

General Instructions

The *Test of Economic Literacy* has been designed to be used primarily by teachers. Those who administer the test should be familiar with the procedures described below. Unless standard procedures are followed when the TEL is given, results obtained at different times may not be strictly comparable. The TEL is easy to administer and may be scored by hand or machine.

The norm data provided in this manual are the result of testing many student groups throughout the United States. To ensure meaningful comparisons with the national sample, it is essential that the instructions that follow are adhered to by examiners during administration of the TEL. Specific directions for the student are provided in the test booklet. Although these instructions will be adequate for most situations, it is suggested that the examiner carefully look over the test and the answer sheet before the testing session begins in order to anticipate any problems.

Materials

The TEL is printed in a reusable test booklet. If students follow instructions, there will be no writing in the TEL test booklets, which can therefore be used a number of times. After each testing session the booklets should be inspected for pencil marks. Any marks should be completely erased before the booklet is reused or else marked up test booklets should be discarded.

The test questions may be answered on a facsimile of the answer sheet printed in Appendix B or on any machine-readable answer sheet having at least 46 answer positions, each with at least four options. If answers are to be machine scored, the teacher must use answer sheets that are compatible with the scoring equipment to be used, and the students must mark the answer sheets with the appropriate pencils (usually No. 2 lead). In any event, caution students not to use a ballpoint pen. Use of a pen will make it difficult to change responses and most machines will not score ballpoint markers. For machine scoring, it is well to have additional pencils of the appropriate type on hand.

The room in which the test is to be administered should be well-lighted, well-ventilated, and reasonably quiet. The students should have sufficient working space to handle both the test booklet and answer sheet. Students should be seated so as to minimize opportunities to see each other's answers (unless the group-testing method is used).

All test materials should be counted and assembled prior to the testing session. Some time may be saved by placing an answer sheet under the front cover of every test booklet so that both answer sheet and test booklet can be distributed in a single operation. Make certain that each student receives only one booklet.

Timing the Test

The TEL requires about 40 minutes of testing time. If testing is done in a class period that is shorter than 40 minutes, and the time cannot be extended, allowance should be made for this factor when test scores are evaluated and compared to the national norms. Since the TEL was designed as a power test rather than as a speed test, it is probable that most students will complete it before 40 minutes are up. Since many class periods are set at 45 to 50 minutes, the testing should begin as soon as possible after the start of class. To insure that students do not arrive late, it may be helpful to remind them in the class prior to the test to try hard to be on time and to bring No. 2 pencils.

Directions for the Examiner

First pass out the answer sheets (and No. 2 pencils if necessary) and instruct those taking the test to fill in the appropriate information on the answer sheet. Make sure the students mark which form of the test, A or B, they are taking. If the test booklets and answer sheets are not passed out together, distribute the booklets while the students are filling out the preliminary information on the answer sheet. Test booklets should remain face up and closed until the examiner gives the signal to begin.

When everyone has received all the necessary materials, say:

11. William E. Becker Jr. and John C. Soper, eds., "A Comprehensive Evaluation Design for the Program and Structure of the Joint Council on Economic Education and Its Affiliates."

"Read the directions to yourselves as I read them aloud:

"1. Please fill out the information requested on the answer sheet before beginning your test.

"2. When marking your answer sheet, use *only* a regular No. 2 pencil. DO NOT USE A BALLPOINT PEN. Do not make any stray marks on the answer sheet. If you make a mistake, erase completely the answer you wish to change.

"3. This test is designed to measure your understanding of economics. Not all students will have taken a formal course in economics, but most have learned something about the subject in their regular courses, through reading, listening to the radio, or watching television. These questions will measure how well you understand the principles of economics and the way our economy operates. It is probable that you will not know the answers to some questions. However, you should answer *every* question by marking what you think is the best choice, using the information you *do* have to select your answer. Work at a comfortable speed, but do not spend too much time on any one item. The test consists of forty-six questions or incomplete statements, for each of which you are to choose the *one best answer*. Even though in some instances more than one answer may appear to be correct, your task is to choose the *best* answer."

After reading the directions say

"Sample questions 1 and 2 on the front cover of the test booklet give examples of a properly marked answer. Notice that response C on question 1 and response A on question 2 have been filled in clearly. When you begin the test, read the question carefully and choose your answer. Then use your pencil to blacken the lettered space *on the answer sheet* that corresponds to the letter of the answer you have chosen."

If the answer sheets will be scored by machine, say:

"The papers will be scored by machine, so be sure that you use only a No. 2 pencil to mark your answers on your answer sheet. Fill in the space under the letter that corresponds to the letter of the answer you have chosen. Be certain to make each mark heavy and black. If you change an answer, be sure to erase your first mark completely before making another mark. Erase all stray marks on your answer sheet."

Whether the sheets are to be scored by hand or by machine, say:

"When you finish the test go back and check your answers. If you have any questions, raise your hand now. No questions concerning any aspect of the test will be answered after the test has begun. But if your pencil breaks or if you detect a faulty booklet or answer sheet, raise your hand."

When you have answered all questions, say:

"You will have 40 minutes for the test. Remember, make no marks on the test booklet itself. All right—begin."

During the first few minutes of the test, check to make sure that everyone is marking his or her answer sheet properly. When testing is completed, collect all materials. Verify that all materials have been collected before students leave the room.

If *both* forms are to be administered during the same testing session, 80 minutes should be set aside for actual test taking by the students. If a small group is tested, the teacher may find it convenient to distribute the second test booklet and answer sheet as students complete the first test. With larger groups, it may be more convenient to distribute both test booklets and the two answer sheets at the beginning of the testing session. In either case, students must be especially careful to indicate the form of the test (A or B) on each answer sheet.

5. Scoring the Test

The score for the *Test of Economic Literacy* is the number of correct responses. The maximum possible score on each form is 46. A single answer sheet is used and the sheet may be scored by hand or by machine.

To score the test by hand, use the key and facsimiles of the answer sheet in Appendix B. Scan each answer sheet to make certain only one answer has been marked for each question; if more than one answer space has been marked, the response to that question is considered wrong. To use the scoring key, punch out the blackened circles for Form A or B and place the key over the answer sheet. Double check to be sure that the scoring key is for the same form (A or B) as the test. The raw score is the total number of answer marks showing through the holes minus any multiple-marked items.

After the tests have been graded and returned to the students, the teacher should read each test item aloud (as the students read silently from their test booklets and take note of their responses), asking those who answered correctly to raise their hands. The number of correct responses divided by the number of students taking the test and multiplied by 100 is the class percentage correct for that item. This percentage may be compared with the appropriate norming data in Part II.

Many schools and virtually all colleges are now equipped to score tests like the TEL by machine. In

most such cases, a special answer sheet is required that is compatible with the scoring machine available. Usually, No. 2 pencils *must* be used to mark answers. If machine scoring will be used, check with the scoring service in advance about required answer sheets and pencils.

Machine scoring of tests often also produces a printout of the student roster with raw scores and percentiles for the scores based on the group tested. In addition, the group mean, standard deviation, and a frequency distribution are often provided. Such data can be very useful in the interpretation of group results.

6. Technical Data

Standardization and Norms

The TEL was normed in May–June 1977,[12] using a nationwide sample. The purpose of the norm data collection was to make test scores as meaningful as possible. The testing provided national norms against which test users may compare the scores of their students. In addition, statistical data obtained from the norm data were used to judge the technical adequacy of the TEL.

The norm data were collected from classes in the 92 high schools listed in Appendix A. The approach taken in selecting schools was to obtain a diverse group that would include (1) students from different geographical regions (Northeast, North Central, South, and West), (2) different areas (urban, suburban, "mixed," and rural), and (3) different sizes of schools. However, no claim is made that the group tested is exactly representative of the student population enrolled in high schools throughout the nation. There is, however, a high probability that the norming sample contains a random distribution of students by general ability (IQ), socioeconomic status, and ethnic-racial mix, although no explicit categorical data are available to differentiate students by such subpopulations.

The data should not be considered as indicating standards of achievement in high school economics. Rather, they are intended to aid teachers in comparing their students with others. The comparisons will be meaningful to the extent that composition of the student body in any class is like that in the data sample.

12. If the TEL is administered to a student group at a different time of the academic year, performance levels for that group relative to the national norm group may not be strictly comparable.

TABLE 5: Aggregate Statistics for the TEL, Norming Sample, Spring 1977

	Form A	Form B
Mean	21.59	22.89
Standard deviation	8.52	8.43
N	4,192	4,468
Standard error of measurement (S.E.M.)	3.02	3.01
Cronbach Alpha	0.875	0.872
Per cent with economics	55	58

For the norm sample as a whole (8,660 students), Table 5 reports the aggregate statistics obtained for each form of the test. These statistics indicate that Form A of the TEL is slightly more difficult than Form B (mean difference = 1.3 points), but that the standard deviations, standard errors of measurement, and Cronbach Alphas do not differ significantly between forms (the standard error of measurement and Cronbach Alpha are measures of test reliability, discussed below).

Norm Tables

Tables 6 and 7 present the norms obtained for eleventh and twelfth graders—with and without economics training, by form of the test, in percentiles. These tables permit the conversion of raw scores to percentile ranks for the appropriate grade level and also according to whether students have had prior instruction in economics or not. Percentile ranks are obtained by calculating the total percentage of students in a given grade who scored at or below a certain raw score.

Percentile norms allow comparisons to be made among students in different groups. For example, an eleventh grader with economics who obtains a raw score of 29 on Form A of the TEL is performing as well as, or better than, 91 per cent of all twelfth graders taking Form A without economics who participated in the norming of the TEL.

To use the norms in tables 6 and 7, simply read across from the raw score column to the column of percentile rankings for the appropriate grade level.

Item Analysis

Test administrators may want to know how their students performed on certain parts of the TEL. This would be particularly important in cases where the teacher covered only some of the concepts included in the test. Tables 8 and 9 show the average percentage of correct responses for each item for students with and without economics and,

TABLE 6: Percentile Norms for the TEL, Form A

Raw Score	Grade 11 With Economics	Grade 11 Without Economics	Grade 12 With Economics	Grade 12 Without Economics
46				
45			99	
44			99	
43	99		97	
42	99		96	99
41	99		94	99
40	98		91	99
39	98	99	89	99
38	97	99	86	99
37	97	99	84	98
36	97	99	80	98
35	95	99	78	97
34	94	99	75	96
33	93	98	72	96
32	92	98	69	95
31	90	98	65	95
30	88	97	63	93
29	86	97	60	91
28	84	96	55	89
27	81	95	53	87
26	79	92	50	84
25	75	91	46	82
24	71	88	43	79
23	68	83	40	75
22	63	80	37	70
21	59	76	34	65
20	53	71	30	60
19	48	66	27	53
18	44	58	25	46
17	37	51	22	39
16	30	42	20	34
15	25	36	18	28
14	21	29	15	24
13	16	22	13	18
12	12	17	11	14
11	9	14	8	10
10	6	8	6	6
9	4	4	4	3
8	2	2	1	2
7	1	1		2
6				1

TABLE 7: Percentile Norms for the TEL, Form B

Raw Score	Grade 11 With Economics	Grade 11 Without Economics	Grade 12 With Economics	Grade 12 Without Economics
46				
45				
44			99	
43			99	
42			97	
41	99	99	95	
40	99	99	93	99
39	99	99	91	99
38	99	99	88	99
37	99	98	85	99
36	98	98	82	97
35	98	97	79	96
34	97	96	75	94
33	96	94	72	93
32	95	93	69	92
31	94	91	64	91
30	93	89	61	89
29	92	88	57	87
28	90	86	53	84
27	87	82	50	81
26	84	79	45	79
25	81	75	41	75
24	76	71	37	73
23	70	66	33	71
22	66	61	30	65
21	60	56	27	62
20	55	50	24	58
19	49	46	21	52
18	43	40	18	48
17	35	35	15	41
16	30	30	13	37
15	26	24	11	31
14	21	19	9	27
13	15	15	8	22
12	12	11	5	17
11	8	7	3	12
10	5	4	2	8
9	3	2	1	5
8	1	2	1	3
7	1	1		1
6				

also, the overall item discrimination coefficient (see Section 3, above). These data are also reported in the Discussion Guide, below.

Tables 10 and 11 show the percentage of all students responding to each of the four options for each of the 46 items and the percentage of omitted responses, by form of the TEL. An item analysis of the kind presented in tables 8 through 11 can be very useful. For example, if a substantial percentage of students answered A when the correct answer is C, the teacher would do well to study distractor A in an attempt to determine the reason. Perhaps the students were misled by the teacher's or textbook's presentation of the material or by some item of supplementary material.

Reliability

The reliability of a test is the degree to which that test measures student performance consistently. For example, two students taking the same test are likely to obtain different scores, but each student taking the test again (without intervening instruction in the subject being tested) should obtain about the same score as the first time. However, many

TABLE 8: Percentage of Correct Responses and Discrimination Power, TEL Form A

Item	Correct Answer	Discrimination Coefficient	Per Cent Correct With Economics	Per Cent Correct Without Economics
1	C	42	20 8	4 8
2	A	45	60 1	40 1
3	C	39	41 9	19 1
4	C	34	71 0	51 8
5	B	38	67 2	53 6
6	C	47	70 2	56 5
7	B	36	55 7	44 3
8	D	28	62 1	54 9
9	B	31	52 5	48 8
10	A	44	40 7	30 4
11	D	33	53 9	47 8
12	A	46	59 0	46 3
13	B	45	71 4	63 2
14	C	39	57 6	52 5
15	C	38	81 2	75 4
16	D	45	63 1	53 0
17	A	32	49 5	38 8
18	B	36	50 6	35 9
19	A	40	81 8	78 4
20	D	45	44 0	35 4
21	B	24	30 2	18 6
22	D	46	69 7	60 0
23	D	37	49 9	41 0
24	A	40	54 7	45 9
25	D	40	65 6	53 0
26	B	47	70 9	55 6
27	D	45	69 3	59 3
28	C	43	53 6	44 7
29	B	43	46 5	33 7
30	C	36	32 8	20 5
31	B	30	53 2	40 2
32	B	46	70 5	55 0
33	A	40	50 9	33 9
34	C	38	36 7	24 1
35	A	35	39 5	33 1
36	B	39	54 9	43 8
37	A	32	33 1	23 7
38	B	30	35 7	30 0
39	C	38	46 6	34 8
40	D	45	40 4	25 3
41	C	37	44 5	30 0
42	D	47	41 4	21 5
43	A	42	43 3	29 8
44	C	41	42 6	27 9
45	D	27	20 0	14 9
46	A	36	44 6	32 5

TABLE 9: Percentage of Correct Responses and Discrimination Power, TEL Form B

Item	Correct Answer	Discrimination Coefficient	Per Cent Correct With Economics	Per Cent Correct Without Economics
1	D	41	62 1	34 8
2	C	28	52 5	42 6
3	A	34	43 2	38 2
4	D	35	28 6	15 2
5	B	33	45 4	41 2
6	B	38	68 5	62 5
7	A	36	58 9	51 3
8	C	41	46 4	40 2
9	B	22	40 6	30 9
10	C	43	43 4	36 4
11	A	42	67 4	57 8
12	A	29	51 2	46 6
13	D	39	86 9	86 0
14	D	43	33 7	23 1
15	A	50	80 9	76 0
16	A	32	59 2	53 7
17	C	46	75 4	75 9
18	B	41	71 3	67 8
19	A	46	77 6	69 0
20	B	44	75 2	69 3
21	D	39	37 0	25 9
22	C	25	25 9	21 5
23	B	33	59 9	59 5
24	D	44	45 0	30 0
25	C	39	61 4	59 7
26	B	27	58 4	51 5
27	D	34	65 3	52 6
28	A	45	37 2	28 9
29	B	41	53 1	45 3
30	A	39	44 7	35 1
31	D	36	38 7	20 1
32	D	57	53 5	44 3
33	B	28	34 6	33 6
34	A	56	66 7	58 7
35	D	51	51 5	35 5
36	C	32	51 1	42 4
37	C	47	56 8	49 4
38	C	52	69 1	58 8
39	A	25	27 0	20 5
40	D	49	45 4	35 6
41	B	39	52 3	46 0
42	B	17	28 6	26 8
43	C	40	52 9	50 3
44	B	43	64 0	53 2
45	C	50	60 6	51 1
46	A	25	26 5	24 0

factors (including practice in taking the test) cause changes in student performance from day to day. As a result, we can never measure a student's performance perfectly, i.e., obtain his or her "true" score.

Fortunately, it is possible to estimate the amount of variation in test scores that is due to measurement error, and therefore to specify a range within which one can be relatively certain the "true" score will fall. By taking account of such measurement error, the reliability of the test as a whole can be estimated.

The standard error of measurement (S.E.M.), reported in Table 5 for both forms of the TEL, is an estimate of the amount of variation which can be expected in a test score. A raw score of 23 on a test with an S.E.M. of 3.0 indicates that we can be about 67 per cent certain that a person's "true"

TABLE 10: Percentage Response to Each Alternative, TEL Form A (*N* = 4,192)

Item	A	B	C	D	Blank
1	41	12	14*	33	0
2	51*	5	20	24	1
3	10	22	32*	37	0
4	8	23	63*	6	0
5	10	61*	24	5	0
6	9	13	64*	13	1
7	16	51*	21	12	1
8	27	8	5	59*	0
9	10	51*	22	17	1
10	36*	13	29	22	0
11	22	12	14	51*	0
12	53*	11	20	14	1
13	9	68*	6	17	0
14	21	7	56*	17	0
15	4	9	79*	7	0
16	12	14	15	59*	0
17	45*	22	16	17	0
18	23	44*	6	25	1
19	80*	8	8	3	1
20	24	19	16	40*	0
21	7	25*	49	18	0
22	10	11	13	65*	1
23	18	16	20	46*	1
24	51*	15	20	13	1
25	15	13	11	60*	1
26	15	64*	12	8	1
27	12	13	9	65*	2
28	17	21	50*	10	2
29	9	41*	17	31	3
30	31	27	27*	12	2
31	17	48*	16	16	2
32	8	64*	14	11	3
33	44*	17	15	21	3
34	21	9	31*	36	3
35	37*	19	18	23	3
36	13	50*	16	17	4
37	29*	27	23	17	4
38	16	33*	29	17	4
39	23	16	41*	14	6
40	15	19	27	33*	5
41	16	18	38*	22	6
42	23	13	25	32*	6
43	37*	27	18	12	6
44	9	24	36*	25	6
45	18	31	26	18*	7
46	39*	25	19	10	7

*Correct response

TABLE 11: Percentage Response to Each Alternative, TEL Form B (*N* = 4,468)

Item	A	B	C	D	Blank
1	28	17	4	51*	0
2	18	19	48*	14	1
3	41*	18	20	20	1
4	41	14	20	23*	1
5	35	44*	13	9	0
6	18	66*	7	9	1
7	56*	18	16	9	1
8	20	13	44*	22	1
9	3	37*	7	53	1
10	28	15	41*	16	1
11	63*	24	6	6	0
12	49*	9	34	7	1
13	3	6	4	87*	0
14	26	17	27	29*	1
15	79*	6	9	7	0
16	57*	9	12	22	1
17	4	15	76*	4	0
18	8	70*	9	13	1
19	74*	11	7	8	1
20	9	73*	10	8	0
21	11	35	21	32*	1
22	15	11	24*	49	1
23	9	60*	12	19	1
24	17	15	28	39*	1
25	18	7	61*	13	1
26	17	56*	15	11	1
27	10	18	11	60*	1
28	34*	21	25	19	1
29	21	50*	18	10	1
30	41*	20	18	20	2
31	26	12	30	31*	1
32	9	18	21	50*	2
33	14	34*	21	30	2
34	63*	11	17	7	2
35	13	17	24	45*	2
36	20	18	48*	12	2
37	11	26	54*	7	2
38	19	9	65*	4	3
39	24*	20	37	16	3
40	19	21	15	41*	4
41	15	50*	11	21	3
42	13	28*	37	18	4
43	13	11	52*	20	4
44	15	60*	14	7	4
45	10	12	57*	17	4
46	26*	29	25	15	5

*Correct response

score lies in a range from 20 to 26 (23 ± 3.0), or that we can be 95 per cent certain that the "true" score lies in a range from 17 to 29 [23 ± (2 × 3.0)]. The smaller the S.E.M., the more accurate a test is as a measuring instrument. Individual test scores are best thought of as lying within a range, rather than as single scores, because of our inability to measure perfectly, i.e., we never obtain a standard error of measurement of zero.

Another measure of overall test reliability is Cronbach's Alpha, a statistic yielding a coefficient with a value ranging from zero to 1.00; the higher the coefficient, the greater the statistical reliability. A Cronbach Alpha of 1.00 would indicate a perfectly reliable test, while a coefficient of zero would indicate a totally unreliable one. In spite of low discrimination indexes, a number of TEL questions (e.g., 42 on Form B) were retained in the final version of the

TABLE 12: Statistical Differences before and after Instruction (total $N = 163$)

	Students with Economics Instruction ($N = 53$)			Students without Economics Instruction ($N = 110$)		
	Post-test	Pretest	Difference	Post-test	Pretest	Difference
Mean	25.51	19.72	5.79	21.07	18.80	2.27
Standard deviation	7.45	5.82	4.99	5.51	5.39	4.82
Standard error	1.02	0.80	0.69	0.53	0.51	0.46
	Pre/post correlation = 0.744 ($P \to 0$)			Pre/post correlation = 0.608 ($P \to 0$)		
	$t = 8.45$ ($P \to 0$)			$t = 4.94$ ($P \to 0$)		
	degrees of freedom = 52			degrees of freedom = 109		

TEL because of considerations of content validity. If questions with higher discrimination indexes had been used instead, the test would probably have had a higher overall reliability coefficient.

Finally, it should be stressed that the reliability of the *Test of Economic Literacy* is substantially higher than that of most teacher-made tests. Therefore, the major question to be determined by each user of the TEL is whether the test as a whole—and the individual questions on it—are appropriate for the testing of his or her students.

Validity

A most important question for an educational achievement test such as the *Test of Economic Literacy* is whether or not it measures what *ought* to be measured. This is not a question that can be answered by reference to statistics. The *content validity* of the TEL, as mentioned in sections 1 and 2, was established by the working committee's examination of a large number of test items. Those items selected by the working committee were then subjected to review by members of the National Advisory Committee, and the two panels exercised their best judgment as to the appropriate content and structure of the instruments. Thus the TEL can be said to possess "face validity." It was felt that the composition of the National Advisory Committee and of the working committee would best ensure the overall validity of the test instruments for their intended use. A check on the validity of any individual test item may be made by inspecting the relative scores of students in the norming sample who had or who had not had prior economics instruction (see Part II, below). In appraising the validity of these instruments for any particular classroom, research, or evaluation application, the user should refer to the MCG *Framework* at the same time.

The validity of a test, as defined above, cannot be determined quantitatively. Content validity is determined by comparing the test questions with the content judged to be important, not by comparing scores on the TEL with some other measure. On such a definition, there is clearly no one "validity" for a test. Whether the TEL is a valid test depends on the purpose for which it is used. Some teachers may disagree with the content or with the objectives emphasized by the TEL Working Committee and the National Advisory Committee. For those teachers, the TEL will not be valid.

We have also obtained limited evidence of the TEL's *concurrent validity*, the test's correlation with other measures of achievement in economics. Data were obtained from a highly rated midwestern school, showing student performance on the test before and after economics instruction. Table 12 presents the relevant data for this sample of 163 students. The figures show that the observed mean differences are significant beyond the 0.01 level of confidence.

Additional Descriptive Statistics

Tables 13 and 14 present some additional descriptive statistics derived from the TEL norming sample by form. These supplementary data are broken down by sex of student, class year (junior and senior), type of area (rural, suburban, urban, "mixed"), geographical region (Northeast, North-central, South, West), prior economics instruction, and whether or not the student was enrolled in a DEEP Cooperating School System of the Joint

TABLE 13: Descriptive Statistics for Various Groups within the Norming Sample, Form A

	With Economics			Without Economics		
	Mean	Std. Dev.	Number	Mean	Std. Dev.	Number
By student sex and grade level						
Females	22.92	8.81	981	18.24	5.97	847
Grade 11	20.23	7.28	222	17.04	5.30	373
Grade 12	25.72	9.10	515	18.96	6.40	311
Males	24.81	9.56	1,261	19.49	6.93	970
Grade 11	20.72	7.75	216	18.60	6.09	364
Grade 12	27.82	9.82	664	19.90	7.06	355
By type of community						
Rural	21.86	8.11	28	17.00	5.44	10
Suburban	24.59	9.68	1,656	18.74	6.58	1,560
Urban	22.09	8.00	522	18.51	6.00	259
Mixed (urban-suburban)	23.78	7.85	108	22.07	6.37	58
By region						
Northeast	22.47	7.89	347	18.29	5.88	898
South	19.64	7.71	735	19.52	6.64	378
North Central	27.04	9.75	920	17.56	6.51	375
West	27.21	8.47	252	21.85	8.17	191
By DEEP status of district						
DEEP	24.89	9.37	1,405	18.49	6.31	1,346
Non-DEEP	22.52	8.96	909	19.59	6.93	541
All students	23.99	9.28	2,242	18.91	6.53	1,817

TABLE 14: Descriptive Statistics for Various Groups within the Norming Sample, Form B

	With Economics			Without Economics		
	Mean	Std. Dev.	Number	Mean	Std. Dev.	Number
By student sex and grade level						
Females	23.62	8.43	1,128	20.25	6.68	845
Grade 11	19.74	6.09	318	19.99	6.47	460
Grade 12	25.74	9.04	581	19.92	7.21	170
Males	25.15	9.14	1,400	21.34	7.53	905
Grade 11	20.13	6.47	317	21.58	7.34	413
Grade 12	27.44	9.47	725	20.32	7.85	193
By type of community						
Rural	22.15	9.63	415	21.39	7.80	241
Suburban	26.16	8.93	1,548	20.86	7.15	1,347
Urban	21.75	6.81	578	21.01	7.26	210
Mixed (urban-surburban)	17.16	5.77	45	15.34	4.99	47
By region						
Northeast	23.50	8.11	464	20.69	7.05	291
South	21.38	7.43	465	20.03	7.07	702
North Central	26.42	9.57	1,259	21.22	7.37	578
West	23.62	7.85	262	22.18	7.56	258
By DEEP status of district						
DEEP	27.11	8.85	975	20.94	7.50	679
Non-DEEP	22.73	8.47	1,604	20.66	7.11	1,136
All students	24.47	8.86	2,528	20.81	7.15	1,750

Council on Economic Education.[13] For each subgroup, the mean TEL score, standard deviation, and subgroup N are given.

Correlation with General Ability

We have no large-sample data on student general ability (IQ) or reading scores (a reasonable proxy for IQ) due to federal privacy act constraints. However, the limited sample of 163 students referred to above did provide a subsample of 93 students with matched TEL and Iowa Test of Educational Development (ITED) reading scores, as well as data on grade level, TEL pretest scores, student sex, and type of class the student had attended (experimental or control). A simple correlation coefficient of 0.642 exists between post-test scores on the TEL and the ITED reading scores for these 93 students. This suggests a highly significant relationship between reading ability (which may be interpreted as a surrogate for intelligence) and performance on the TEL. This positive correlation is consistent with the expectations of most test and measurement specialists, based upon experience with numerous other correlations of achievement tests and general ability.[14]

13. The Developmental Economic Education Program (DEEP) is the major school-based program of the JCEE. A DEEP Cooperating School System is one which has entered into a contractual affiliation with the JCEE, an affiliated state council, and a regional center for economic education to develop its curriculum in economic education, train its teachers in economics; produce, adapt, or adopt new economic education materials; and evaluate its progress. At this writing, over 450 school systems in the United States, enrolling more than 10 million students, participate in DEEP.

14 For this subsample of 93 students, a multiple linear regression equation was used to explain individual student performance on the TEL post-test. That equation yields:

$$\begin{aligned}\text{POST-TEL} = {} & 7.526 + \underset{(1.11)}{1.890}\ \text{SENIOR} \\ & + \underset{(5.87)}{0.530}\ \text{PRE-TEL} + \underset{(1.97)}{1.771}\ \text{SEX} \\ & + \underset{(5.21)}{0.636}\ \text{ITED} + \underset{(0.93)}{3.579}\ \text{CONEX}\end{aligned}$$

where POST-TEL is the TEL post-test score, SENIOR equals 1 for twelfth-grade students and zero otherwise, PRE-TEL is the TEL pretest score, SEX equals 1 for males and zero for females, ITED is the Iowa Test of Educational Development composite reading score, and CONEX equals 1 for students enrolled in a Title IV-C experimental course and zero for students in control courses. The figures in parentheses below the regression coefficients are *t* statistics; those for PRE-TEL, ITED, and CONEX are significant at the 0.01 level. The equation as a whole is highly significant with an adjusted $R^2 = 0.639$ and an *F* statistic of 33.59 with 5 and 87 degrees of freedom. Each point on the student's ITED reading score (mean = 13.92 and standard deviation = 4.33) "explains" 0.636 points on the TEL post-score (mean = 23.01 and standard deviation = 7.06), holding the other variables constant.

Part II. ITEM DISCUSSION AND RATIONALE

FORM A

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
1. *Three major factors of production are land, labor, and capital. Which of the following groups best illustrates these factors?* *A. Rent, workers, and money.* *B. Oil, taxi drivers, and bonds.* ***C. Iron ore, clerks, and trucks.*** *D. Farmers, investors, and manufacturers.*	To the economist, "land" means natural resources in general, "labor" means human effort, and "capital" means productive equipment or structures, e.g., machinery, tools, buildings, locomotives. Answer C is the only one that satisfactorily illustrates each of the three factors of production: land (iron one), labor (clerks), and capital (trucks). Note that "money" (in A) and "bonds" (in B) are *not* capital in the way economists use that term.	20.8	4.8	.42
2. *What is meant by the statement that every economic system (such as tradition, command, or market economy) faces the fact of scarcity?* ***A. There are not enough productive resources to satisfy all wants of a society.*** *B. Every young society faces scarcity, but older economies overcome this problem.* *C. There are times when some products can be had only by paying high prices.* *D. All economies have depressions during which scarcities exist.*	"Scarcity," in economics means that society has more wants than it has available resources (or means) to satisfy all those wants. This is a fundamental concept of economics and underlies the idea that ordinarily consumers, business, and government tend to choose the most effective use of limited resources, i.e., they must follow the principle of "economizing." The problem of scarcity is faced continually by every society, whatever the form of its government or economic system.	60.1	40.1	.45

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
3. *The opportunity cost of a new public high school is the* A. *money cost of the new building.* B. *necessary increase in the annual tax rate.* ***C. other desirable economic goods that must be given up to build the school.*** D. *cost of constructing it now as opposed to the cost of a new school at a later date.*	The opportunity cost of producing anything is the goods or services that might alternatively have been produced with the same resources. In other words, opportunity cost refers to what is forgone once one uses money or real resources for a specific purpose.	41.9	19.1	.39
4. *Which of the following questions is faced by all economic systems (i.e., tradition, command and market)?* A. *How will corporations be organized?* B. *How can markets be kept competitive?* ***C. What goods and services will be produced?*** D. *How will governments protect private property?*	No economic system can escape the problem of choosing which mix of goods and services to produce. However, each type of economic system makes such choices in a distinctive way. Traditional economic systems decide mainly by custom or habit what goods and services will be produced. Command economies do so mainly by the decisions of a central planning authority. Market economies decide mainly through the price signals received by producers selling in competitive markets.	71.0	51.8	.34
5. *In a market economy, the purpose of profits is to* A. *get businesses to act in a socially responsible manner.* ***B. persuade businesses to produce what consumers demand.*** C. *provide funds to pay workers better wages.* D. *redistribute income from poor to rich.*	Relatively high profits in a competitive market economy will induce producers to increase output and/or will attract additional producers. Relatively low profits will discourage production of added output and/or will induce some firms to leave an industry that shows low profits. Barriers to entry or exit in a particular industry may inhibit the process of adjusting output to the amount of consumer demand.	67.2	53.6	.38
6. *Which of the following is the most essential for a market economy?* A. *Functioning labor unions.* B. *Good government regulation.* ***C. Active competition in the marketplace.*** D. *Responsible action by business leaders.*	Active competition in the marketplace is essential for the effective operation of a market economy. Competitive markets force business firms to produce the products consumers demand at the lowest prices that will cover costs. Although the factors mentioned in the other answers may help a market economy to work well, such an economy could function without any of them.	70.2	56.5	.47

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
7. *Specialization and exchange within a nation or between nations is likely to have which of the following effects?* *A. All costs of production will rise.* ***B. More goods and services can be produced.*** *C. The danger of economic instability is reduced.* *D. The independence of both nations and individuals is increased.*	When individuals, businesses, or nations specialize in doing what they can do best and exchange their respective products, the total quantity of goods and services for which there is demand will increase. The danger of economic instability may, however, actually increase as a result of increased specialization, and the independence of both nations and individuals will decrease—i.e., *inter*dependence will increase.	55.7	44.3	.36
8. *Within a market economy a coastal state harvests a great quantity of fish; an inland state has a productive beef cattle industry. If exchanges of fish and beef take place between these states* *A. one cannot determine gains or losses from the given information.* *B. one state gains at the expense of the other.* *C. both states lose.* ***D. both states gain.***	Both states gain because both states benefit from specialization and exchange. The fact that more than one exchange of fish for beef takes place rules out all other answers, for if a state did not benefit, there would be no incentive for it to participate in additional exchanges.	62.1	54.9	.28

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
9. *Suppose a large city is investigating the elimination of rent controls on housing at a time when the vacancy rate is extremely low—only 1% of all apartments in the city are vacant. Which of the following is most likely to occur if rent controls are eliminated?* *A. A decrease in rents and a decrease in the supply of housing.* ***B. An increase in rents, perhaps followed later by an increase in the supply of housing.*** *C. An increase in the demand for housing, followed by a decrease in the supply of housing.* *D. No change in rents, since price controls are usually set where supply and demand intersect.*	Rent controls while vacancy rates are low set prices (rents) which are below equilibrium prices. When the controls are removed, rents will rise to the market-clearing level. The higher rents are likely to induce builders and property owners to increase the supply of rental housing over time.	52.5	48.8	.31
10. *Of the following which is the most general cause of low individual incomes in the United States?* ***A. Lack of valuable productive services to sell.*** *B. Discrimination against nonunion employees.* *C. Unwillingness to work.* *D. Progressive tax rates.*	Most individuals earn their income from wages or salaries—payments for the productive services they render. Low individual incomes generally reflect the fact that the people affected—often because of lack of educational and technical skills—do not have productive services to sell that are valued highly by potential employers. The other answers may account for some low incomes, but A provides the most general reason.	40.7	30.4	.44
11. *The demand for a factor of production depends largely on* *A. the supply of the factor.* *B. the supply of other factors of production.* *C. the demand for other factors of production.* ***D. the demand for the product or products which it helps produce.***	Producers combine factors of production in the proportions needed to produce the goods and services they seek to sell. What they seek to produce is determined by what is demanded in the marketplace. Thus, the demand for a productive factor is a *derived demand*, depending largely on the market value of the good or service it helps to produce.	53.9	47.8	.33

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
12. *In a market economy, the public interest is served even when individuals pursue their own private economic goals, because of* ***A. the operation of competitive markets.*** *B. the social responsibility of business leaders.* *C. careful planning and coordination of market activity.* *D. individuals who understand what is in the public interest.*	In a market economy, the desire of business owners to make profits and the desire of workers to obtain higher wages lead to the production of those goods and services consumers want most. A market economy relies on competition to assure that if consumer demand goes up, increased output is supplied at the lowest prices that will cover all costs of production and still leave a reasonable profit. Thus, competitive markets play a more central role than any of the forces in the other answers.	59.0	46.3	.46
13. *If consumers are to exercise their freedom of choice wisely in a market economy, they must* *A. know where and when products are produced.* ***B. know the prices of alternative products available.*** *C. know whether a product was produced by a monopolist.* *D. have sufficient income to permit them to purchase whatever they choose.*	When consumers know the relative prices of alternative products, they can determine which combination of purchases will satisfy them best at the lowest total cost.	71.4	63.2	.45
14. *Teen Power, a teenage organization, proposed that the minimum wage for teens should be increased. What effect would this increase most likely have on teen wages and employment in a market economy?* *A. Wage rates would go up and teen employment would go up.* *B. Wage rates would go down and teen employment would go up.* ***C. Wage rates would go up and teen employment would go down.*** *D. Wage rates would go up and teen employment would stay the same.*	Since minimum wage laws are designed to raise wages above their market-determined rates, teen wages would go up but teen employment would most likely decline. Reduced teen employment may be caused by several factors: (1) employers may find it cheaper to substitute machinery for some teenage workers; (2) employers may be able to hire older, more experienced workers at the higher wage; (3) some employers of teens may have to curtail operations because of the higher wage costs.	57.6	52.5	.39

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
15. *According to the "law of supply and demand," if twice as many heads of lettuce were grown this year because of good weather as were grown last year* *A. the supply of lettuce would stay the same this year.* *B. the demand for lettuce would go down this year.* ***C. the price of lettuce would go down this year.*** *D. the price of lettuce would go up this year.*	All other things remaining the same, an increase in market supply will in general lower the price of each unit supplied. The greater the increase in supply, the greater the fall in price. Because of the fall in price, however, the quantity demanded should be larger.	81.2	75.4	.38
16. *The price of shoes is likely to be increased by* *A. new machines reducing the cost of shoe production.* *B. more capital investment by producers.* *C. a decrease in the demand for shoes.* ***D. a decrease in the supply of shoes.***	This is another example of how price is determined by supply and demand in competitive markets. A decrease in the supply of shoes with demand unchanged will tend to raise their price. The factors referred to in the other answers would tend to lower the price of shoes.	63.1	53.0	.46
17. *Assume that the demand increases for bread produced by many competitive firms. The resulting rise in the price of bread will usually lead to* ***A. more being produced.*** *B. less being produced.* *C. no change in production.* *D. elimination of inefficient businesses from the market.*	A rise in the price of bread resulting from increased demand in a competitive market will generally lead to the production of more bread. Bakers will see the opportunity to sell more loaves at the higher price and therefore will try to meet the increased demand so as to enlarge their profits.	49.5	38.8	.32

FORM A

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
Questions 18 and 19 are based on the following table.				

State Tax Table

Income	Percentage Rate	Tax Amount Minimum	Tax Amount Maximum
$ 0-1000	0	$ 0	$ 0
$1001-2000	10	$100	$ 200
$2001-3000	20	$400	$ 600
$3001-4000	30	$900	$1200

18. *The tax in the table above is a* *A. proportional income tax.* ***B. progressive income tax.*** *C. regressive income tax.* *D. fixed income tax.*	Since the *rate* of taxation increases as income increases, the tax in the table is progressive. A proportional income tax is one whose rate remains constant as income changes, and a regressive tax is one whose rate falls as income increases. A fixed income tax (if one existed) would presumably have a constant *amount* of tax, independent of income. Such a tax would be regressive.	50.6	35.9	.36
19. *Using the information in the table above, we know that as income increases the rate of taxation* ***A. increases and the amount of tax increases.*** *B. increases and the amount of tax decreases.* *C. decreases and the amount of tax increases.* *D. decreases and the amount of tax decreases.*	As income increases, both the *rate* of taxation and the *amount* of the tax increase, and these are the hallmarks of a progressive tax.	81.8	78.4	.40

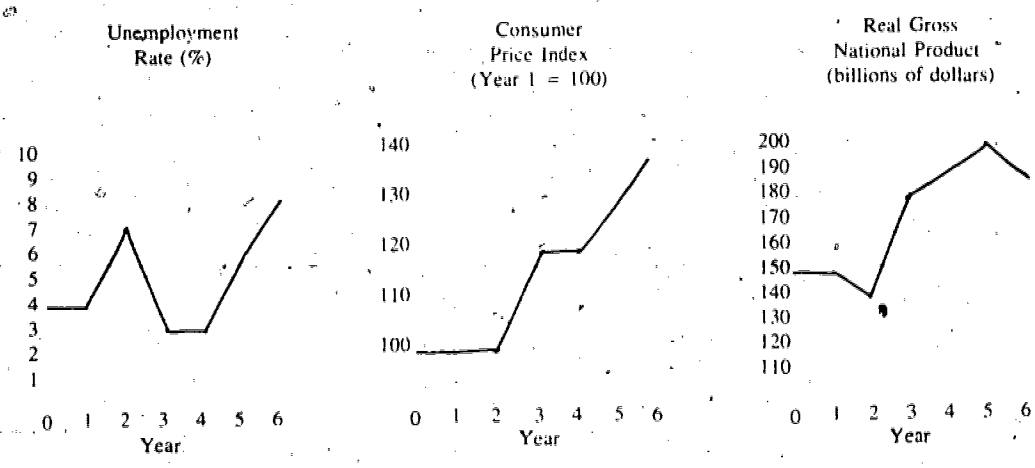
ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
20. *You read the following headline: "COFFEE GROWERS FORM MONOPOLY." How will the new coffee monopoly most likely differ from a highly competitive coffee growing industry?* *A. Profits in the coffee industry will now be certain.* *B. The coffee growers will increase their use of capital goods.* *C. The coffee growers will increase output and hire more workers.* ***D. There will be less incentive for the coffee growers to be efficient.***	A monopolized industry differs from a competitive one because a monopoly (or cartel) generally places production or marketing limits on each member and also imposes a minimum price on the product. There is thus little or no market incentive for the members of a monopoly (or cartel) arrangement to be efficient. Answers B and C are inappropriate because of the restrictions on output. Answer A is inappropriate because profits in the coffee industry depend upon many factors and the formation of a monopoly or cartel will not guarantee high profits.	44.0	35.4	.45
21. *If you saw a newspaper headline that read, "ACME WIDGET CORPORATION RAISES PRICES; REST OF WIDGET INDUSTRY EXPECTED TO FOLLOW," you would know that Acme Widget Corporation was most likely to be in an industry with* *A. one seller.* ***B. few sellers.*** *C. many sellers.* *D. total regulation.*	An industry with comparatively few sellers (but more than one) is called an oligopolistic industry. Price-setting behavior in such an industry frequently involves "price leadership" by one firm, with the other firms following. Firms in such an industry cannot assume that their price-setting activities will not influence other firms in the industry. If Acme raises its prices but the rest of the industry does not follow, Acme will lose customers to its (few) competitors and will be forced to reduce its prices to the level prevailing in the industry.	30.2	18.6	.24
22. *The supply of a product increases at the same time the demand for it falls. In the absence of other changes its price* *A. cannot be determined.* *B. will stay the same.* *C. will rise.* ***D. will fall.***	Either an increase in supply or a decrease in demand alone would generally lead to a lower price in the absence of counteracting forces. If they occur together, a lower price is bound to follow.	69.7	60.0	.46

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
Questions 23 and 24 are based on the following information: *Smog in the Central City area is largely caused by automobile exhaust fumes. The smog problem could be virtually eliminated if approximately 100 air-purification plants were built in the area. These plants would simply draw in smog-filled air, remove the smog, and pump the clean air back into the Central City atmosphere. It is estimated that the cost of operating each plant would be $10,000 per year.*				
23. *It is highly unlikely that private business firms would build and operate the plants and sell their services directly to individual residents of the Central City area because* *A. the cost of operating the plants would be too great.* *B. people are unlikely to be willing to pay for smog-free air.* *C. it would be less costly for the government to build and operate the plants than for private business firms to do so.* ***D. it would probably be impossible to provide smog-free air to those who are willing to pay for it while withholding it from those who refuse to pay.***	Since the only possible way to get all the residents of an area to pay for removing smog from the air is through taxation, only a government authority with taxing power is likely to erect air-purification plants. "Cleaned up air" in this case is a *public good*, that is, one whose benefits cannot be restricted to those who pay the costs of providing it. Such goods and services are therefore usually paid for by some form of general taxation, for example, clean air, paved streets, police protection.	49.9	41.0	.37
24. *Suppose that the government of Central City were to build and operate the air-purification plants. From the standpoint of achieving efficiency in the allocation of economic resources, which of the following taxes should be increased to provide the additional tax revenues needed to finance the operation of the air-purification plants?* ***A. Motor vehicle fuel.*** *B. General sales.* *C. Property.* *D. Income.*	A tax on motor fuel—a "user fee" for polluting the air—would have two desirable effects from the standpoint of allocative efficiency: it would make those who are causing the pollution pay the costs of cleaning it up, and it would reduce the amount of smog somewhat since the tax would raise gasoline prices, thus tending to reduce the quantity of gasoline consumed.	54.7	45.9	.40

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
25. *The total output of the economy is bought by which of the following three large groups of spenders?* *A. Farmers, laborers, and householders.* *B. Corporations, households, and investors.* *C. Investors, speculators, and manufacturers.* ***D. Consumers, business firms, and governments.***	Economists typically divide the economy into consumers, business firms, and governments, the three major groups that buy the total output of the economy. The other responses are all only parital listings of those who buy.	65.6	53.0	.40
26. *The best single measure of the total economic output in the United States is the* *A. consumer price index.* ***B. gross national product.*** *C. total amount of take-home pay.* *D. index of industrial production.*	The gross national product is the total value of all final goods and services produced in a nation during a given time period. The other measures cover only particular aspects of an economy's operation.	70.9	55.6	.47

Questions 27, 28, and 29 are based on the following graphs.

PARKLAND GRAPHS



27. *Parkland had both rising unemployment and a high rate of inflation during which period?* *A. Years 1-2.* *B. Years 2-3.* *C. Years 3-4.* ***D. Years 4-5.***	In years 1-2, unemployment rose but the Consumer Price Index (CPI) remained steady. In years 2-3, unemployment fell, and the CPI rose. In years 3-4, the unemployment rate was steady and so was the CPI. Only in years 4-5 did *both* unemployment and prices rise simultaneously.	69.3	59.3	.45

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
28. *Parkland had an increase in output with a relatively low inflation rate during which period?* *A. Years 1-2.* *B. Years 2-3.* ***C. Years 3-4.*** *D. Years 4-5.*	In years 1-2, output (real gross national product) declined while prices remained steady. In years 2-3, output rose sharply, but the price level also increased considerably. In years 4-5, output increased but prices again rose markedly. Only in years 3-4 did output increase without a substantial increase in the price level.	53.6	44.7	.43
29. *What is the economic situation and the most appropriate monetary and fiscal policies during years 1-2?* *A. Unemployment is falling; a budget deficit and/or easy money policy is needed.* ***B. The economy is in a recession; a budget deficit and/or easy money policy is needed.*** *C. Inflation continues and accelerates; a budget surplus and/or tight money policy is needed.* *D. Unemployment is rising while inflation accelerates; a budget surplus and/or easy money policy is needed.*	In the period covering years 1 and 2, unemployment increased sharply (from 4 to 7 percent) while the CPI remained roughly constant (at a level of 100) and real output fell by roughly $10 billion (from $150 billion to $140 billion). The combination of rising unemployment and falling real GNP is a typical sign of an economy in a recession. Many economists consider that a recession is in progress when real output falls for at least two consecutive quarters. The so-called neo-Keynesian policy stance under such conditions would call for a budgetary deficit and/or an "easy" monetary policy. Answer A is incorrect because unemployment is *rising*, not falling; answers C and D are incorrect because inflation is constant, not accelerating. Moreover, under D, the policy mix of a budget surplus *and* easy money would be self-canceling.	46.5	33.7	.43
30. *Which of the following groups is typically hurt the most by unexpected inflation?* *A. Farmers.* *B. Debtors.* ***C. Lenders.*** *D. Manufacturers.*	Of the groups listed, lenders are typically hurt most by unexpected inflation since they are later repaid a fixed sum of money that has less buying power than it had when the loan was made. Moreover, lenders may well have made the loan at lower interest rates than those they would have charged after an unexpected inflation had taken place.	32.8	20.5	.36
31. *The commercial banking system creates money when banks* *A. sell bonds to the public.* ***B. extend loans to the public.*** *C. increase loans to the Federal Reserve System.* *D. purchase bonds from the Federal Reserve System.*	When banks in the commercial banking system loan money to the public, they typically do so by crediting the checking accounts of the borrowers. Money is literally "created" in this process.	53.2	40.2	.30

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
32. *The functions of money are to serve as* *A. a determinant of capital spending and aggregate supply.* ***B. a unit of account, a medium of exchange, and a store of value.*** *C. a determinant of investment, consumption, and aggregate demand.* *D. a stabilizing force, a means of income redistribution, and a resource allocator.*	As a unit of account, money serves as the common denominator in which all prices are expressed. As a medium of exchange, money is acceptable as a means of payment for the purchase of virtually any good or service. As a store of value, money on hand that is not spent on current purchases may be retained for purchases that might be made in the future.	70.5	55.0	.46
33. *The limit of an economy's real output at any time is set by* ***A. the quantity and quality of labor, capital, and natural resources.*** *B. business demand for final goods and services.* *C. government regulations and spending.* *D. the amount of money in circulation.*	While all the items listed may influence the amount of an economy's real output at any specific time, the upper limit is set by the quantity and quality of its real resources—labor, capital, technology, and natural resources. Business demand, the amount of money in circulation, or government spending may help to increase real output but the ceiling on output is set by the real resources available for production.	50.9	33.9	.40
34. *The Federal Reserve Board generally tries to increase the money supply when it wants to* *A. hold down the government debt.* *B. increase the government debt.* ***C. fight unemployment.*** *D. fight inflation.*	The Fed generally tries to increase the money supply when it wants to fight unemployment. An increase in the money supply usually leads to more spending (increased demand) and greater spending generally creates a need for more production which in turn increases employment. More money would tend to produce inflation rather than fight against it, so answer D is wrong. The primary function of the Federal Reserve System is to regulate the supply of money in the economy and to maintain monetary and credit conditions that are favorable to stable economic growth at high employment. While these Federal Reserve activities may at times indirectly affect the government debt, this result is incidental to its main purpose. Therefore, answers A and B are incorrect.	36.7	24.1	.38

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
35. To experience economic growth a developing country must **A. increase investment.** B. increase consumption. C. use the market system. D. use central economic planning.	To economists, investment is the act of acquiring the tools, equipment, and structures needed to produce other goods and services. If investment increases, a country can usually produce more, and more production is the means of achieving economic growth. Increased consumption, use of the market system, or use of central economic planning are neither necessary nor sufficient conditions for inducing economic growth.	39.5	33.1	.35
36. In a market economy high wages depend largely upon A. socially responsible business leaders. **B. high output per worker.** C. actions of government. D. minimum wage laws.	In a market economy, what businesses can pay workers depends primarily upon the contribution the workers make to the salable output of the business. Thus, in a market economy, high wages are fundamentally due to high output per worker, although other factors have some influence.	54.9	43.8	.39
37. Increasing the federal budget surplus is more desirable in a period of, **A. inflation.** B. depression. C. falling prices. D. mass unemployment.	Inflation results when an economy experiences more demand for goods and services than it has capacity to produce. Under so-called neo-Keynesian policy prescriptions, an important way to relieve this condition is for the government to take in more revenues than it spends. The resulting budget surplus diminishes the amount of purchasing power in the economy and hence reduces the pressures that lead to inflation.	33.1	23.7	.32
38. Often an economy operates at less than full employment. This is most likely to occur A. whenever competition is intense. **B. when total spending is inadequate.** C. when there is excess demand inflation. D. when there is a scarcity of unskilled labor.	There is likely to be unemployment of both labor and machines when individual spending for consumer goods plus business spending for materials and equipment plus government spending—that is, "total spending"—falls below the amount needed to buy all the goods and services an economy can produce. Such shortfalls are characteristic of deflation, not inflation. Scarcity of labor is typical of a *high*-employment situation.	35.7	30.0	.30
39. If total demand declines relative to the productive capacity of the economy, which of the following is likely to occur? A. Inflation. B. Increased employment. **C. A slower growth rate.** D. A government budget surplus.	A slowing in the rise of total demand implies that the productive capacity of an economy is being used less than before. This in turn implies a slower growth rate of the nation's real GNP. None of the other answers are realistic alternatives.	46.6	34.8	.38

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
40. *If, when there is full employment, the federal government increases its spending without increasing its tax revenues, generally* *A. an increase in unemployment will occur.* *B. a serious depression will occur.* *C. the national debt will decrease.* ***D. inflation will occur.***	Government spending without offsetting tax collections normally adds to total spending in the economy because government spending rises without a reduction in private spending. Thus, when there is full employment and total output cannot rise, additional government spending (unless accompanied by matching higher taxes) will tend to bid up prices for the available goods and services, i.e., inflation will result.	40.4	25.3	.45
41. *Increased taxation is the preferred method of financing government spending when* *A. the interest rate is low.* *B. corporate profits are low.* ***C. the economy is experiencing inflation.*** *D. the economy is experiencing a recession.*	Inflation implies that there is more money available than there are goods and services to spend it on. If the government increases its taxes, it withdraws funds that otherwise would by and large have been spent in the marketplace. Such an increase in taxes tends to reduce private purchasing power and allows the government to engage in public expenditures without adding to inflationary pressures.	44.5	30.0	.37
42. *Which of the following four statistics is generally accepted as the best measure of the economic growth of a nation?* *A. Total employment.* *B. Index of stock prices.* *C. Money income per capita.* ***D. Real income per capita.***	Real income per capita is the best measure of economic growth for two reasons. One is that measuring income in real terms removes the distorting effects of a changing price level. The other is that *total* income may be high or low merely because a country has many or few people, e.g., China vs. Norway. Dividing total real income by the population adjusts for such a difference.	41.4	21.5	.47
43. *For most nations, the reduction of tariffs would probably* ***A. force some workers out of jobs in protected industries.*** *B. lessen job opportunities in export industries.* *C. lower the average level of living.* *D. injure most farmers.*	Tariffs are often established in order to insulate a domestic industry from imports brought in from countries that can make and sell the product more cheaply. The reduction of such tariffs would probably force some workers in the protected industries out of their jobs.	43.3	29.8	.42

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
44. *One advantage of the corporate form of business organization is that* *A. corporations do not pay taxes.* *B. stockholders make larger profits.* ***C. stockholders have limited liability.*** *D. corporations are larger than other forms of business.*	Stockholders in a corporation cannot be sued or held liable for more than the worth of their ownership in the corporation. Any other assets they may hold are exempt from such suits or claims. Hence, corporation stockholders are said to have "limited liability." Its existence helps to increase capital formation since investor risk is reduced.	42.6	27.9	.41
45. *A national system of free medical care for the aged poor is established. The system is paid for by an increase in the income tax. These actions promote one economic goal, but work against another. Specifically, these actions are likely to* *A. reduce security but promote efficiency.* *B. reduce equity but promote efficiency.* *C. reduce stability but promote growth.* ***D. reduce freedom but promote equity.***	This question involves a trade-off between freedom and equity, two economic goals of the United States. Economic freedom is reduced by the increase in the income tax. Since all taxpayers are taxed more in order to help the aged poor, the taxpayers' economic freedom is curtailed because they no longer have the taxed dollars to spend or save as they wish. On the other hand, equity (a more equal distribution of income and/or welfare) is promoted because the aged poor are given access to medical care that they could not otherwise obtain in the quantites they desire. Whether or not such a system is "desirable" is not in question here. One must be able to identify which economic goals are in conflict in the given situation.	20.0	14.9	.27
46. *Labor unions in the United States have* ***A. strengthened the bargaining position of unionized workers in relation to their employers.*** *B. greatly increased the wages of union workers compared to non-union workers.* *C. organized a majority of the American labor force.* *D. increased competition in the labor market.*	When workers organize into labor unions, their strength in bargaining with employers over wages and working conditions generally increases. There is some evidence that answer B is also partially correct, but the differences appear to be small and not independent of the general economic health of the industry involved. In any event, this effect is less pervasive than that indicated by option A. Answer C is wrong because less than one-quarter of American wage earners are unionized. Answer D is wrong because unionization reduces competition among workers in a given labor market.	44.6	32.5	.36

DISCUSSION GUIDE AND RATIONALE — FORM B

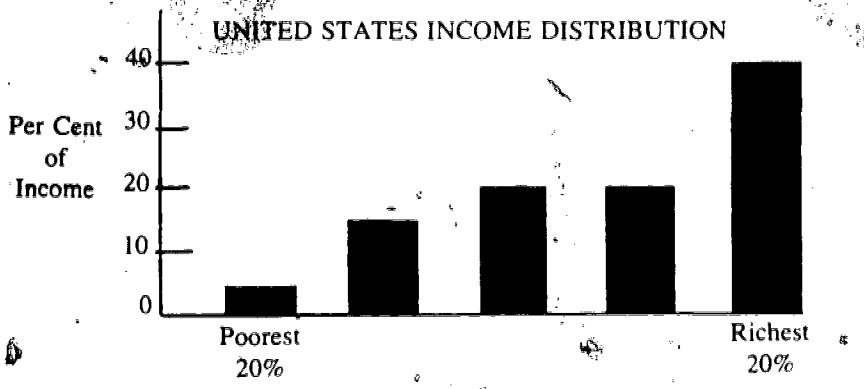
ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
1. *Every economic system must make choices. Which of the following choices do all economic systems face?* *A. To balance the government's budget by reducing spending.* *B. To save money and thus reduce the national debt.* *C. To dispense with the production of luxuries.* ***D. To make the best use of scarce resources.***	The economic wants of any society are virtually limitless. In this light, all resources are scarce and every economic system must choose how to make the most efficient use of its scarce resources to produce those goods and services it desires or needs the most.	62.1	34.8	.41
2. *When a nation's human and material resources are being fully and efficiently used, more of any one product* *A. cannot be produced.* *B. can be produced only if there is a general decrease in prices.* ***C. can be produced only if there is less production of some other products.*** *D. cannot be produced unless private enterprise rather than government does so.*	When a nation's human and material resources are being fully and efficiently used, in order to produce more of any one product some resources must be shifted away from the production of another product. This illustrates the problem of economizing, always faced when resources are limited.	52.5	42.6	.28
3. *Newspaper headline: "SCHOOL REFERENDUM DEFEATED." In many recent votes on school budgets, citizens have defeated school tax proposals and forced schools to eliminate extracurricular activities because of a lack of funds. What, if any, are the opportunity costs of such decisions?* ***A. Whatever benefits there might have been from the extracurricular activities.*** *B. Since less money will be spent there are no opportunity costs.* *C. The costs of what taxpayers will now buy with what they saved.* *D. The opportunity to use school facilities fully.*	The opportunity costs of the decision to vote down the school referendum are the benefits students and perhaps others will forgo from the elimination of extracurricular activities. The taxpayers presumably place a greater value on using for their own purposes the money that they would otherwise have paid in school taxes to support the extracurricular activities.	43.2	38.2	.34

FORM B

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
4. *Of the following, the principle of diminishing returns is best illustrated by* *A. any decline in the average rate of profit.* *B. the decline in personal income as workers age.* *C. small firms being driven out of business by large firms.* ***D. a slowing rate of increase in output as farmers add increasing amounts of fertilizer to their land.***	The principle of diminishing returns states that as more of any one resource is added to a fixed amount of other resources, after some point the increase in total output will become less and less. Answer D is a clear case of this process.	28.6	15.2	.35
5. *The best definition of profit is* *A. total assets minus total liabilities.* ***B. total revenues minus total costs.*** *C. total sales minus all taxes.* *D. total sales minus wages.*	Profit is what is left over after all costs of production (total costs) are subtracted from total revenues (price per unit times the number of units sold). Profit is the fundamental incentive for firms or individuals to engage in business in a market economy.	45.4	41.2	.33
6. *Most of the money that American businesses receive by selling their products or services is paid as* *A. profits to the owners of the businesses.* ***B. wages and salaries to employees.*** *C. rent to property owners.* *D. interest on debts.*	U.S. businesses pay out on average about three-fourths of all revenues received in the form of wages and salaries. The other factor shares (rent, interest, and profits) are substantially smaller. For instance, in the decade from 1968 to 1977, employee compensation, i.e., wages and salaries, accounted for some 75.7% of national income. Rental income claimed, 2.0%; net interest, 5.5%; corporate profits before taxes, 9.2%. The remainder, 7.5%, was "income of unincorporated enterprises," a large portion of which is the equivalent of wages.	68.5	62.5	.38
7. *Specialization and division of labor by nations followed by increasing international trade probably would* ***A. increase total world production of wanted goods and services.*** *B. eliminate differences in standards of living among nations.* *C. increase the likelihood of worldwide unemployment.* *D. lower living standards in the wealthy nations.*	The case for specialization and division of labor among nations is substantially the same as within nations—that it will lead each enterprise to produce those things at which it is relatively most efficient. The result is that the world's total production of goods and services increases. While differences in the standards—or levels—of living between nations might in the long run be *reduced*, there is little likelihood of their being eliminated. Neither of the other answers is plausible.	58.9	51.3	.36

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
8. *The specialization of labor results in* *A. increased price inflation.* *B. less output per hour worked.* ***C. more economic interdependence.*** *D. more equal distribution of income.*	Specialization of labor means that workers in a certain industry or a given location tend to produce only those products that they can make the most efficiently. Therefore, they must buy other products that workers elsewhere make the most efficiently. These circumstances tend to increase trade between regions or nations and promote greater economic interdependence.	46.4	40.2	.41
9. *Within a market economy a northern state produces a great quantity of cheese, a southern state grows many oranges. If exchanges of cheese and oranges take place between these states* *A. both states lose.* ***B. both states gain.*** *C. one state gains at the expense of the other.* *D. one cannot determine gains or losses from the given information.*	Both states gain because both states benefit from specialization and exchange. The fact that more than one exchange of cheese for oranges takes place rules out all other answers, for if a state did not benefit there would be no incentive for it to participate in additional exchanges.	40.6	30.9	.22
10. *Which tax is likely to alter most the pattern of consumer choice among various products?* *A. A general sales tax.* *B. A personal income tax.* ***C. A specific excise tax.*** *D. A business profits tax.*	A specific excise tax (a tax on a particular product) is most likely to alter the pattern of consumer choices among various products. This is because excise taxes raise the prices of some products relative to others and thereby tend to shift consumer spending away from the higher-priced products. The other taxes listed are spread more evenly over products or simply reduce the level of spending without affecting the relative attractiveness of different items.	43.4	36.4	.43
11. *"Economic demand" for a product refers to how much of the product* ***A. the people are willing and able to buy at each price.*** *B. the people want, whether they can buy it or not.* *C. the government orders to be made.* *D. is available for sale.*	"Economic demand" may be described as a schedule of quantities of a good or service that consumers want and are able to buy at different prices.	67.4	57.8	.42

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
12. *Initially, the price system in a market economy reacts to a shortage of a product by* ***A. raising the price and producer profits.*** *B. lowering the price and producer profits.* *C. raising the price, but lowering producer profits.* *D. lowering the price, but increasing producer profits.*	Product shortages cannot be ended instantly under any type of economic system. In a market economy, the immediate effect of a shortage is to raise the price of the product in short supply, thereby increasing producer profits and making an increase in production attractive. In the longer run, product prices and producer prices should both decline as added production raises the supply through the pressure of competition.	51.2	46.6	.29



13. *Using the chart above, the poorest 20% of the U.S. population received about what percentage of the nation's income?* *A. 40%* *B. 20%* *C. 15%* ***D. 5%***	The height of the smallest bar represents the share of total income received by the poorest 20% of the population. That bar indicates that the poorest fifth of the population receives about 5% of income.	86.9	86.0	.39

FORM B

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
14. *You read the following headline: "ORANGE GROWERS FORM MONOPOLY." How will the new orange monopoly most likely differ from a highly competitive orange growing industry?* *A. Profits in the orange industry will now be certain.* *B. The orange growers will increase their use of capital goods.* *C. The orange monopoly will hire more workers and increase output.* ***D. There will be less incentive for the orange monopoly to be efficient.***	A monopolized industry differs from a competitive one because a monopoly (or cartel) generally places production or marketing limits on each member and also imposes a minimum price on the product. There is thus little or no market incentive for the members of a monopoly (or cartel) arrangement to be efficient. Answers B and C are inappropriate because of the restrictions on output. Answer A is inappropriate because profits in the orange industry depend upon many factors and the formation of a monopoly or cartel will not guarantee high profits.	33.7	23.1	.43
15. *A rise in the price of which product would be likely to increase the demand for butter?* ***A. Margarine.*** *B. Butter.* *C. Cheese.* *D. Bread.*	Many people use margarine instead of butter. If margarine becomes more expensive, some users will shift to butter. Thus, the demand for butter will go up. A rise in the price of butter or of bread will tend to reduce the buying of those items. The demand for butter is unlikely to be influenced much by changes in the price of cheese.	80.9	76.0	.50
16. *If U.S. farm output remains the same how will several years of bad weather in Europe and the Soviet Union affect American food prices?* ***A. Raise them.*** *B. Decrease them.* *C. Make no change.* *D. Cannot be determined.*	Bad weather in Europe and the Soviet Union for several years would have an adverse impact on crop production in those regions. To make up for shortfalls in their domestic production, Europe and the Soviet Union would be likely to import considerably more food or grains than usual, thus causing market prices in the world (and U.S.) grain markets to rise. Therefore, food prices in the United States will go up as well.	59.2	53.7	.32
17. *As more sewage processing plants are built and put into operation, more fertilizer may be produced as a by-product. If that happens, fertilizer will be* *A. increasingly scarce.* *B. more expensive.* ***C. less expensive.*** *D. wanted less.*	If the total supply of fertilizer is increased, the price of fertilizer will fall, other things remaining the same.	75.4	75.9	.46

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
18. *If the government were to levy a tax of one dollar on every pair of pants sold, which of the following would most likely result?* *A. Suppliers would sell more and charge a higher price.* ***B. Consumers would pay a higher price for pants and probably buy a smaller quantity.*** *C. Consumers would pay a higher price and as a result suppliers would make larger profits.* *D. Suppliers would increase the quantity sold in order to make up for the taxes paid to the government.*	The tax of $1 per pair of pants would have the same effect (to the consumer) as an increase of $1 per pair in the cost, or supply price, of pants. The resulting higher price of a pair of pants would induce some consumers to reduce their purchases of pants. Thus, consumers in general would pay a higher price for pants, and *some* consumers would either entirely forgo the purchase of pants or reduce the number of pairs they buy.	71.3	67.8	.41
19. *Business firms wish to sell their products at high prices. Households wish to buy products at low prices. In a market economy this conflict of interests* ***A. is resolved by competitive markets.*** *B. is resolved by government intervention.* *C. is resolved in favor of business since all household heads are members of firms.* *D. does not exist; there is really no conflict of interest between households and firms.*	A market economy relies on competition among business firms to assure that consumers get the products they want at the lowest prices that will allow businesses to cover costs and obtain a reasonable profit. In this way, a competitive market economy acts to balance the interests of consumers and producers.	77.6	69.0	.46
20. *Assuming that the supply of a product remains constant as the demand for it increases, its price will normally* *A. fall.* ***B. rise.*** *C. stay the same.* *D. either rise or fall.*	When demand increases, i.e., is higher than before at any given price, and supply remains the same, there will normally be pressure for the price to rise.	75.2	69.3	.44

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
21. *"Americans are a mixed-up people. Everyone knows that baseball is far less necessary than food and steel. Yet they pay ball players a lot more than farmers and steelworkers." Why?* *A. The employers of the ball players are monopolists.* *B. Ball players are really entertainers rather than producers.* *C. There are fewer professional ball players than farmers or steelworkers.* ***D. Good ball players are scarce compared to the demand for their services.***	Salaries or wages earned by most individuals depend basically on the demand for their services relative to the supply of such services. Since excellent baseball players are very scarce relative to the strong demand for their services from major league clubs, the salary they receive is higher than that received by most other individuals. The other answers *may* all be true, but answer D provides the most fundamental explanation.	37.0	25.9	.39

Questions 22 and 23 are based on the following news story:

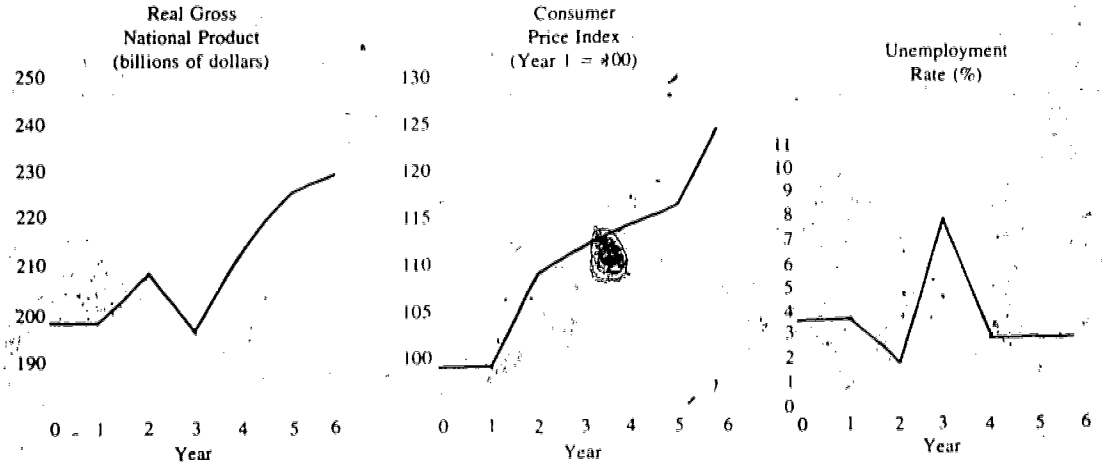
"ANOTHER SHIP WRECKED – For the fourth time in six years, Rocky Point claims more victims. Millions of dollars in ships and cargo lost. Ships heading into the nearby port must come dangerously close to this well known hazard. Citizens are concerned that no lighthouse protects shipping into our port."

22. *Private businesses are* not *likely to build a lighthouse because* *A. the cost of building the lighthouse is too high.* *B. the risk of loss to shipowners is eliminated by insurance.* ***C. a private business would have great difficulty collecting fees from shipowners.*** *D. it would cost more for a private firm to build the lighthouse than for the government to do so.*	The lighthouse is a classic case of a *public good*, i.e., a good not subject to the exclusion principle. In other words, beneficiaries of the lighthouse (ships at sea) cannot be excluded from consumption of the benefits of the lighthouse if they refuse to pay for those benefits. Therefore, a private business is unlikely to build a lighthouse because it would have great difficulty in identifying the consumers of its services and collecting fees from them.	25.9	21.5	.25

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
23. *Suppose that the state decides to build and operate a lighthouse to prevent shipwrecks. What would be the fairest way to pay for the project?* *A. An income tax on all shipowners.* ***B. A docking tax on all ships using the seaport.*** *C. A general sales tax on all goods sold in the state.* *D. A general sales tax on all goods sold in the seaport.*	A docking tax on all ships using the seaport near the lighthouse would be the "fairest" way for the state to pay for the project because such a tax would be closest to a "user fee" for the services of the lighthouse. The options in the other answers would tax many nonusers of the lighthouse services and would therefore be unfair.	59.9	59.5	.33
24. *Unexpected inflation is most likely to benefit* *A. persons living on fixed pensions.* *B. life insurance policyholders.* *C. savings bank depositors.* ***D. people who owe money.***	Unexpected inflation benefits people who owe money because after inflation they pay back less in terms of real purchasing power for the amount they have borrowed. The three groups in the other answers lose from inflation.	45.0	30.0	.44
25. *Gross National Product is a measure of* *A. the price level of goods and services sold.* *B. that part of production which is used by the government.* ***C. the market value of a nation's output of final goods and services.*** *D. the quantity of goods and services produced by private businesses.*	Gross national product is a measure of the value of a nation's *total* output of final goods and services in terms of their market prices. Answers B and D cover only part of the nation's total output.	61.4	59.7	.39
26. *When comparing Gross National Product over several years, it is necessary to adjust for* *A. changes in technology.* ***B. changes in the price level.*** *C. product quality improvement.* *D. new products that enhance our wealth.*	Assume that GNP remains the same in terms of the actual quantity of goods and services produced from one year to the next. If the price level has gone up, GNP will rise in dollar terms; if the price level has gone down, GNP will fall in dollar terms. That is why, when comparing GNP for different years, it is necessary to eliminate the effect of (adjust for) any changes in prices.	58.4	51.5	.27

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
27. *The commercial banking system creates money when* *A. business firms extend credit to customers.* *B. individuals deposit currency in banks.* *C. the nation's gold holdings increase.* ***D. banks make loans and investments.***	When banks in the commercial banking system loan money to the public, they typically do so by crediting the checking accounts of the borrowers. Money is literally "created" in this process.	65.3	52.6	.34
Questions 28, 29, and 30 are based on the following graphs.				

ECONOLAND GRAPHS



28. *The rate of inflation was greatest during which period?* ***A. Years 1-2.*** *B. Years 2-3.* *C. Years 3-4.* *D. Years 4-5.*	In years 1-2, the Consumer Price Index (CPI)—a measure of the rate of inflation—rose from 100 to 110, a 10% increase. In the other three periods mentioned, the CPI rose by only 2-3%. Thus, the *rate* of inflation was greatest during years 1-2.	37.2	28.9	.45
29. *During what period was Econoland in a recession?* *A. Years 1-2.* ***B. Years 2-3.*** *C. Years 3-4.* *D. Years 4-5.*	In years 1-2, real GNP rose and the unemployment rate fell; the same combination of events occurred in years 3-4. In years 4-5, real GNP rose moderately while the unemployment rate held contant at 3%. Only during years 2-3 was there a decline in real GNP and a sharp rise in the rate of unemployment, both indicators of a recession.	53.1	45.3	.41

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
30. *What is the economic situation and the most appropriate monetary and fiscal policy during years 5-6?* ***A. It is a period of inflation; a budget surplus and/or tight money policy is needed.*** *B. It is a period of recession; a budget surplus and/or easy money policy is needed.* *C. It is a period of recession; a budget deficit and/or easy money policy is needed.* *D. It is a period of inflation; a budget deficit and/or easy money policy is needed.*	During years 5-6, the total of real GNP rose moderately (from about 227 to 231), the unemployment rate was stable (and low) at 3%, and the CPI rose sharply (from about 117 to 125, or about 6.8%). This combination suggests an inflationary situation. Under so-called neo-Keynesian policy prescriptions, a budget surplus and/or tight monetary policy is called for.	44.7	35.1	.39
31. *Which of the following makes up the major portion of the money supply in the United States?* *A. Federal Reserve notes.* *B. National bank notes.* *C. Currency and coins.* ***D. Checking accounts.***	Checking accounts—or "demand deposits" in bankers' language—make up the major portion of the U.S. money supply, narrowly defined. The remainder consists of currency and coin in the hands of the public. For example, in January 1979, demand deposits accounted for 75% of the narrowly defined money supply.	38.7	20.1	.36
32. *A government budget deficit exists* *A. whenever taxes are reduced.* *B. whenever the national debt is decreasing.* *C. whenever government expenditures are increased.* ***D. when total government spending exceeds revenues.***	A government budget deficit is defined as an excess of government expenditures over tax receipts for the period concerned—usually either a single quarter or a year. A budget surplus is just the opposite: an excess of tax receipts over government expenditures.	53.5	44.3	.57
33. *The maximum gross national product a nation can produce in any one year is set by* *A. its natural resources.* ***B. its productive resources.*** *C. the amount of money people have to spend.* *D. demand for goods and services by families.*	A nation's maximum GNP in any given year is set by its total productive resources. The amount of money people have to spend does not necessarily set a maximum on the nation's GNP because the quantity of money can be readily increased, or its velocity (turnover) can rise, or prices can go down.	34.6	33.6	.28

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
34. *Which one of the following would usually reduce consumer spending?* ***A. A decline in consumer incomes.*** *B. A reduction in personal income tax rates.* *C. An expectation that prices will soon rise.* *D. Increased government payments to individuals.*	Since consumers spend most of the after-tax income they receive, a decline in consumer income will almost certainly reduce consumer spending. The other events listed would tend to increase consumer spending, other things remaining the same.	66.7	58.7	.56
35. *When commercial banks increase their loans to businesses and consumers, the result is* *A. a decrease in the spending power of consumers and businesses.* *B. an increase in government control over the economy.* *C. an increase in the banks' excess reserves.* ***D. an increase in the nation's money supply.***	When commercial banks make loans to businesses or consumers, these funds are in the form of demand deposits at banks, i.e., checking accounts credited to the borrowers. The money supply therefore increases—see rationale for question 31. (We, of course, spend bank deposits by writing checks against them.)	51.5	35.5	.51
36. *In a market economy high wages depend largely upon* *A. minimum wage laws.* *B. actions of government.* ***C. high output per worker.*** *D. socially responsible business leaders.*	In a market economy, what businesses can pay workers depends primarily upon the contribution the workers make to the salable output of the business. Thus, in a market economy, high wages are fundamentally due to high output per worker, although other factors have some influence.	51.1	42.4	.32
37. *If your annual money income rises 50% while prices of the things you buy rise by 100%, then your* *A. real income is unaffected.* *B. money income has fallen.* ***C. real income has fallen.*** *D. real income has risen.*	If the prices of the goods and services a person buys rise more than the increase in that person's income, that individual's purchasing power, i.e., the ability to buy a given quantity of goods and services, has declined. In other words, "real income" has fallen.	56.8	49.4	.47

FORM B

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
38. *One of the reasons a government might reduce taxes is to* *A. slow down the rate of inflation.* *B. slow down the rapid rise in interest rates.* ***C. increase consumer spending and stimulate the economy.*** *D. help finance space exploration and trips to the moon.*	If the government reduces taxes, taxpayers are left with more disposable income to spend or save. Since consumers are likely to spend most of each new dollar in disposable income, an increase in consumer spending is likely. This, in turn, would tend to stimulate the economy.	69.1	58.8	.52
39. *When the economy begins a rapid downturn, the part of total spending that changes by the* largest *percent is* ***A. business spending on factories, machinery, and inventories.*** *B. state and local government spending on all activities.* *C. spending by families on consumer goods and services.* *D. business spending on wages and salaries.*	Business spending on factories, machinery, and inventories (i.e., investment spending) fluctuates widely in booms and recessions, especially compared to the spending indicated in the other answers. Government spending also varies widely at times, but has not usually declined markedly in recessions. Although family spending on consumer goods and services and business spending on wages and salaries are sometimes curtailed in recessionary times, they do not fluctuate as greatly as business investment spending.	27.0	20.5	.25
40. *If from time to time total spending falls short of productive capacity, the rate of growth of the economy over a long period will be* *A. higher because production will be concentrated on necessary goods rather than luxuries.* *B. lower because of a heavier reliance on the raw materials of foreign countries.* *C. higher because inefficient plants, equipment, and labor no longer need be employed.* ***D. lower because some productive resources will not be fully employed.***	If total spending (effective demand) falls short of buying the potential output of a fully employed economy, the rate of growth will be slower because the existence of unused productive capacity will inhibit investment in new productive capacity over the years.	45.4	35.6	.49

FORM B

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
41. *Rapidly growing economies always have* *A. a slow rate of inflation.* ***B. a high rate of investment.*** *C. a low rate of population growth.* *D. a rapid rate of population growth.*	A high rate of investment (defined as the accumulation of more machinery, industrial plants, equipment, and the like) characterizes all rapidly growing economies. The conditions indicated by the other answers have frequently been true of both fast- and slow-growing economies.	52.3	46.0	.39
42. *Which of the following statements about tariffs is true?* *A. Tariffs decrease employment in domestic industries whose products they protect.* ***B. Tariffs benefit some groups at the expense of the national level of living.*** *C. Tariffs increase the market for our exports by reducing our imports.* *D. Tariffs encourage the growth of our most efficient industries.*	Tariffs protect domestic industries that might otherwise be eliminated or reduced in size by foreign competition. The workers and owners engaged in such protected industries benefit from the tariff, but the national level of living suffers because *all* consumers must pay higher prices for the goods produced by the protected industry. Tariffs may *increase* employment in domestic industries whose products they protect. Tariffs may *decrease* the market for exports by reducing imports because other nations gain less foreign exchange with which to buy exports. The most efficient domestic industries will tend to grow with or without tariff protection.	28.6	26.8	.17
43. *The right to join a union and elect representatives to negotiate with the employer is referred to as* *A. a closed shop.* *B. the seniority system.* ***C. collective bargaining.*** *D. right to work legislation.*	Collective bargaining means that workers have the right to join a union and elect representatives to negotiate with their employer about wages, fringe benefits, and the conditions of work for themselves as well as for nonunion workers in similar jobs. A "closed shop" means that all workers of a given employer or industry are required to join the union. The "seniority system" means that worker rights to, e.g., promotion or vacation, are directly tied to length of employment or duration of union membership, and that if employees are laid off, those with the most seniority are laid off last and are rehired first. "Right to work" legislation consists of state laws that mandate the opposite of a closed shop: workers are *not required* to join the union of a given industry or employer.	52.9	50.3	.40

ITEM	RATIONALE	% Correct With Econ.	% Correct Without Econ.	Discrimination Coefficient
44. *Common stocks, limited liability, and unlimited life are characteristic of* *A. proprietorships.* ***B. corporations.*** *C. partnerships.* *D. cartels.*	Proprietorships, partnerships, and cartels cannot issue common stock. Proprietorships and partnerships do not have limited liability, and cartels only have limited liability in the sense that the corporations of which the cartels may consist have limited liability. Proprietorships and partnerships have limited lives in practice. Only corporations possess the three characteristics mentioned in the question.	64.0	53.2	.43
45. *Those who believe that people should be taxed according to their ability to pay would be most likely to favor* *A. an excise tax.* *B. a general sales tax.* ***C. a progressive income tax.*** *D. a residential property tax.*	In general, a progressive income tax levies higher tax rates, the higher a taxpayer's income. Such a form of taxation is closest to levying a tax according to ability to pay, particularly compared to the alternative answers.	60.6	51.1	.50
46. *A national program of free housing for the aged poor is established. The program is paid for by an increase in the income tax. These actions promote one economic goal, but work against another. Specifically, these actions are likely to* ***A. reduce freedom but promote equity.*** *B. reduce equity but promote efficiency.* *C. reduce stability but promote growth.* *D. reduce security but promote efficiency.*	This question involves a trade-off between freedom and equity, two economic goals of the United States. Economic freedom is reduced by the increase in the income tax. Since all taxpayers are taxed more in order to help the aged poor, the taxpayers' economic freedom is curtailed because they no longer have the taxed dollars to spend or save as they wish. On the other hand, equity (a more equal distribution of income and/or welfare) is promoted because the aged poor are given access to housing that they could not otherwise obtain in the quantities they desire. Whether or not such a system is "desirable" is *not* in question here. What is sought is the ability to identify which economic goals are in conflict in a given situation.	26.5	24.0	.25

Part III. APPENDIXES

A. Schools That Participated in the Norming of the TEL

Alabama

Dothan High School
Dothan
36301

Arkansas

Parkview High School
Little Rock
72204

California

Soquel High School
Soquel
95073

Colorado

John F. Kennedy High School
Denver
80227

South High School
Denver
80210

Widefield High School
Security
80911

Connecticut

Mary Immaculate Academy
New Britain
06063

Sheehan High School
Wallingford
06492

Florida

DeLand Senior High School
DeLand
32720

Lakeland Senior High School
Lakeland
33803

Mainland Senior High School
Daytona Beach
32015

Seabreeze Senior High School
Daytona Beach
32015

Georgia

Columbus High School
Columbus
31902

Wayne County High School
Jesup
31545

Hawaii

Kaimuki High School
Honolulu
96816

Idaho

Capital High School
Boise
83704

Illinois

Alton Senior High School
Alton
62002

Canton Senior High School
Canton
61520

Dundee High School
Carpentersville
60110

Evergreen Park High School
Evergreen Park
60642

Hampshire High School
Hampshire
60140

Homewood-Flossmoor High School
Flossmoor
60422

Jacobs High School
Algonquin
60102

Indiana

Central High School
Elkhart
46514

Elkhart Memorial High School
Elkhart
46514

Jay County High School
Portland
47371

Richmond Senior High School
Richmond
47374

Simtown High School
Elkhart
46514

Iowa

Ar-We-Va Community High School
Westside
51467

Fort Dodge High School
Fort Dodge
50501

Kentucky

Henry Clay High School
Lexington
40502

Lafayette Senior High School
Lexington
40503

Louisiana

Southwood High School
Shreveport
71108

Maryland

Dulaney Senior High School
Timonium
21093

High Point Senior High School
Beltsville
20785

Massachusetts

Medford High School
Medford
02155

West Springfield High School
West Springfield
01089

Minnesota

Business Learning Center
St. Paul
55101

Cooper High School
New Hope
55428

Roosevelt High School
Minneapolis
55406

Missouri

Hickman High School
Columbia
65201

Hillcrest High School
Springfield
65803

Purdy High School
Purdy
65734

Montana

Custer County District High School
Miles City
59301

Nebraska

Grand Island Senior High School
Grand Island
68801

New Hampshire

Merrimack Valley High School
Penacook
03301

New Jersey

East Orange High School
East Orange
07017

Hopewell Valley Central High School
Pennington
08534

Pennsauken High School
Pennsauken
08110

Union High School
Union
07083

New York

Byram Hills High School
Armonk
10504

Farmingdale Senior High School
Farmingdale
11735

Grover Cleveland High School
Brooklyn
11237

LaSalle Senior High School
Niagara Falls
14302

Northport High School
Northport
11768

Town of Webb High School
Old Forge
13420

North Carolina

Cummings High School
Burlington
27215

East Senior High School
Kernersville
27284

Grimsley High School
Greensboro
27408

North Forsyth High School
Winston-Salem
27105

Page Senior High School
Greensboro
27405

Parkland High School
Winston-Salem
27107

R. J. Reynolds High School
Winston-Salem
27104

West Forsyth High School
Clemmons
27012

North Dakota

Red River High School
Grand Forks
58201

Ohio

East Tech High School
Cleveland
44104

McKinley Senior High School
Canton
44702

Timken Senior High School
Canton
44702

Oklahoma

Ponca City High School
Ponca City
74601

Oregon

Corvallis High School
Corvallis
97330

Crescent Valley High School
Corvallis
97330

Harrisburg Union High School
Harrisburg
97446

Parkrose High School
Portland
97220

Pennsylvania

Carlisle Senior High School
Carlisle
17013

Emmaus High School
Emmaus
18049

Lower Moreland Senior High School
Huntindon
19006

South Carolina

Spring Valley High School
Columbia
29206

South Dakota

Roscoe High School
Roscoe
57471

Huron High School
Huron
57350

Tennessee

Hamilton High School
Memphis
38111

Sheffield High School
Memphis
38111

UTAH

Sky View High School
Smithfield
84335

Virginia

T. C. Williams Senior High School
Alexandria
22302

Washington

East High School
Bremerton
98310

John R. Rogers High School
Spokane
99207

Lincoln High School
Seattle
98103

North Central High School
Spokane
99205

Shadle Park High School
Spokane
99205

West High School
Bremerton
98310

Wisconsin

Armstrong High School
Neenah
54956

Hamilton High School
Milwaukee
53220

Shorewood High School
Shorewood
53211

B. Handscoring Keys and Answer Sheet

TEST OF ECONOMIC LITERACY

SAMPLES

S1 ○ ○ ● ○ S2 ● ○ ○ ○

1 ○ ○ ○ ○	11 ○ ○ ○ ○	21 ○ ○ ○ ○	31 ○ ○ ○ ○	41 ○ ○ ○ ○
2 ○ ○ ○ ○	12 ○ ○ ○ ○	22 ○ ○ ○ ○	32 ○ ○ ○ ○	42 ○ ○ ○ ○
3 ○ ○ ○ ○	13 ○ ○ ○ ○	23 ○ ○ ○ ○	33 ○ ○ ○ ○	43 ○ ○ ○ ○
4 ○ ○ ○ ○	14 ○ ○ ○ ○	24 ○ ○ ○ ○	34 ○ ○ ○ ○	44 ○ ○ ○ ○
5 ○ ○ ○ ○	15 ○ ○ ○ ○	25 ○ ○ ○ ○	35 ○ ○ ○ ○	45 ○ ○ ○ ○
6 ○ ○ ○ ○	16 ○ ○ ○ ○	26 ○ ○ ○ ○	36 ○ ○ ○ ○	46 ○ ○ ○ ○
7 ○ ○ ○ ○	17 ○ ○ ○ ○	27 ○ ○ ○ ○	37 ○ ○ ○ ○	
8 ○ ○ ○ ○	18 ○ ○ ○ ○	28 ○ ○ ○ ○	38 ○ ○ ○ ○	
9 ○ ○ ○ ○	19 ○ ○ ○ ○	29 ○ ○ ○ ○	39 ○ ○ ○ ○	
10 ○ ○ ○ ○	20 ○ ○ ○ ○	30 ○ ○ ○ ○	40 ○ ○ ○ ○	

FORM A ☐ FORM B ☐
(check one)

RAW SCORE _____ PERCENTILE SCORE _____

NAME _____ DATE _____
(Print) last first initial month day year

AGE _____ DATE OF BIRTH _____ SEX M F
month day year (circle one)

SCHOOL OR TEST CENTER _____

ADDRESS _____
street and number city state

INSTRUCTOR _____ GRADE OR YEAR _____ SEMESTER _____

HAVE YOU HAD A COURSE IN ECONOMICS? YES _____ NO _____ IN PROCESS _____
(check one)

HAVE YOU HAD A COURSE IN CONSUMER EDUCATION OR PERSONAL ECONOMICS?

YES _____ NO _____ IN PROCESS _____
(check one)

TEST OF ECONOMIC LITERACY

Scoring Key

FORM A

1	C	11	D	21	B	31	B	41	C
2	A	12	A	22	D	32	B	42	D
3	C	13	B	23	D	33	A	43	A
4	C	14	C	24	A	34	C	44	C
5	B	15	C	25	D	35	A	45	D
6	C	16	D	26	B	36	B	46	A
7	B	17	A	27	D	37	A		
8	D	18	B	28	C	38	B		
9	B	19	A	29	B	39	C		
10	A	20	D	30	C	40	D		

Scoring Key

FORM B

1 D	11 A	21 D	31 D	41 B
2 C	12 A	22 C	32 D	42 B
3 A	13 D	23 B	33 B	43 C
4 D	14 D	24 D	34 A	44 B
5 B	15 A	25 C	35 D	45 C
6 B	16 A	26 B	36 C	46 A
7 A	17 C	27 D	37 C	
8 C	18 B	28 A	38 C	
9 B	19 A	29 B	39 A	
10 C	20 B	30 A	40 D	